

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD. and  
SAMSUNG ELECTRONICS AMERICA, INC.,  
Petitioners,

v.

SNAPAID, LTD.  
Patent Owner.

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CASE NO. IPR2025-01522  
U.S. PATENT NO. 10,659,682

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**Patent Owners' Exhibit List**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| 2001               | <i>SnapAid, Ltd. v. Samsung Electronics Co., Ltd. et al</i> , 2-25-cv-00378-RWS-RSP (E.D. Tex.), Complaint, ECF No. 1 (April 10, 2025)                                                                                                                                                                                                                                                                                                                                |
| 2002               | <i>SnapAid, Ltd. v. Samsung Electronics Co., Ltd. et al</i> , 2-25-cv-00378-RWS-RSP (E.D. Tex.), Docket Control Order, ECF No. 31 (September 25, 2025)                                                                                                                                                                                                                                                                                                                |
| 2003               | USPTO Notice of Proposed Rulemaking, October 16, 2025, available at <a href="https://public-inspection.federalregister.gov/2025-19580.pdf?utm_campaign=subscriptioncenter&amp;utm_content=&amp;utm_medium=email&amp;utm_name=&amp;utm_source=govdelivery&amp;utm_term=">https://public-inspection.federalregister.gov/2025-19580.pdf?utm_campaign=subscriptioncenter&amp;utm_content=&amp;utm_medium=email&amp;utm_name=&amp;utm_source=govdelivery&amp;utm_term=</a> |
| 2004               | Side-by-Side Comparison of Claim 17 of the '682 Patent, Claim 1 of the '226 Patent, and Claim 1 of the '537 Patent                                                                                                                                                                                                                                                                                                                                                    |
| 2005               | U.S. Provisional Application No. 61/717,216, filed Oct. 23, 2012                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2006               | U.S. Provisional Application No. 61/759,643, filed Feb. 1, 2013                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2007               | Email dated September 3, 2015, from Doron Gonen, Director, Head of Technology Collaboration Group, Samsung                                                                                                                                                                                                                                                                                                                                                            |
| 2008               | Email thread dated September 30, 2015, from Maya Lipkin, Samsung (attaching executed NDA)                                                                                                                                                                                                                                                                                                                                                                             |
| 2009               | Executed Dual Non-Disclosure Agreement between Samsung and SnapAid (attachment to Email thread dated September 30, 2015, from Maya Lipkin, Samsung)                                                                                                                                                                                                                                                                                                                   |
| 2010               | Email dated October 8, 2015, from Igor Gankin, Technology Collaboration Group, Samsung                                                                                                                                                                                                                                                                                                                                                                                |
| 2011               | Email thread dated October 8, 2015, from Ishay Sivan, Founder & CEO, SnapAid (attaching SnapAid Android App User Manual)                                                                                                                                                                                                                                                                                                                                              |
| 2012               | SnapAid Android App User Manual (attachment to Email thread dated October 8, 2015, from Ishay Sivan, Founder & CEO, SnapAid)                                                                                                                                                                                                                                                                                                                                          |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                               |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2013               | Machine Translation of Email thread dated October 7, 2015, from SK Kim, Director, CidT Co., Ltd to Samsung (attaching SnapAid Manufacture Presentation)          |
| 2014               | SnapAid Manufacture Presentation Ver2.pdf (attached to Email thread dated October 7, 2015, from SK Kim, Director, CidT Co., Ltd to Samsung)                      |
| 2015               | Email thread dated November 18, 2015, from Ishay Sivan, Founder & CEO, SnapAid                                                                                   |
| 2016               | Email thread dated January 14, 2016, from Ishay Sivan, Founder & CEO, SnapAid                                                                                    |
| 2017               | Email thread dated October 28, 2015, from Igor Gankin, Technology Collaboration Group, Samsung                                                                   |
| 2018               | Email thread dated September 14, 2017, from Ishay Sivan, Founder & CEO, SnapAid (attaching SnapAid Patent Portfolio)                                             |
| 2019               | SnapAid Patent Portfolio.pdf (attached to Email thread dated September 14, 2017, from Ishay Sivan, Founder & CEO, SnapAid)                                       |
| 2020               | U.S. Patent Publication No. 2017/0237900, Pub. Date: August 17, 2017                                                                                             |
| 2021               | Email dated September 17, 2017, from Igor Gankin, Technology Collaboration Group, Samsung                                                                        |
| 2022               | Motion Success for Stay Pending IPR for Eastern District of Texas, Docket Navigator, current as of November 6, 2025                                              |
| 2023               | Motion Success for Stay Pending PTAB for Eastern District of Texas, Lex Machina, current as of November 7, 2025.                                                 |
| 2024               | Eastern District of Texas Time to Milestones, Docket Navigator, current as of November 6, 2025                                                                   |
| 2025               | Email from Samsung's Counsel providing <i>Sotera</i> stipulation relating to PGR2025-00083                                                                       |
| 2026               | <i>SnapAid, Ltd. v. Samsung Electronics Co., Ltd. et al</i> , 2-25-cv-00378-RWS-RSP (E.D. Tex.), Samsung's Answer and Counterclaims, ECF No. 14 (August 4, 2025) |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                     |
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| 2027               | <i>Smartphones v. Cameras: Closing the gap on image quality</i> , DXOMARK, <a href="https://www.dxomark.com/smartphones-vs-cameras-closing-the-gap-on-image-quality/">https://www.dxomark.com/smartphones-vs-cameras-closing-the-gap-on-image-quality/</a> (last visited Dec. 10, 2020).                                                                                                                               |
| 2028               | <i>Smartphones v. Cameras: Closing the gap on image quality</i> , DXOMARK, <a href="https://www.dxomark.com/smartphones-vs-cameras-closing-the-gap-on-image-quality/">https://www.dxomark.com/smartphones-vs-cameras-closing-the-gap-on-image-quality/</a> (last visited Dec. 10, 2020).                                                                                                                               |
| 2029               | <i>DxOMark Mobile first quick glance: Smartphones beat 5-year-old DSCs</i> , DXOMARK (Oct. 9, 2012), <a href="https://web.archive.org/web/20121011194829/http://www.dxomark.com/index.php/News/DxOMark-news/Smartphones-beat-5-year-old-DSCs">https://web.archive.org/web/20121011194829/http://www.dxomark.com/index.php/News/DxOMark-news/Smartphones-beat-5-year-old-DSCs</a> .<br>(collected from WayBack Machine) |
| 2030               | Excerpts from file history of International Publication No. WO2014064690                                                                                                                                                                                                                                                                                                                                               |
| 2031               | Excerpts from file history of U.S. Patent No. 9,338,348                                                                                                                                                                                                                                                                                                                                                                |
| 2032               | U.S. Patent No. 9,338,348                                                                                                                                                                                                                                                                                                                                                                                              |
| 2033               | Excerpts from file history of U.S. Patent No. 9,661,226                                                                                                                                                                                                                                                                                                                                                                |
| 2034               | European Patent Office – Supplemental Search Report for Application EP 13 84 9379 (03/06/2015)                                                                                                                                                                                                                                                                                                                         |
| 2035               | U.S. Patent No. 9,661,226                                                                                                                                                                                                                                                                                                                                                                                              |
| 2036               | Excerpts from file history of U.S. Patent No. 10,009,537                                                                                                                                                                                                                                                                                                                                                               |
| 2037               | U.S. Patent No. 10,009,537                                                                                                                                                                                                                                                                                                                                                                                             |
| 2038               | <i>SnapAid, Ltd. v. Samsung Electronics Co., Ltd. et al</i> , 2-25-cv-00378-RWS-RSP (E.D. Tex.), Samsung's Invalidity Contentions dated December 1, 2025.                                                                                                                                                                                                                                                              |

Patent Owner SnapAid Ltd. (“SnapAid”) submits this Preliminary Response to the Petition for Inter Partes Review filed by Petitioners Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Petitioner” or “Samsung”) seeking review of Claims 1–20 of U.S. Patent No. 10,659,682 (the “’682 Patent”).

## **I. Introduction**

This proceeding is part of an aggressive invalidity campaign Samsung has launched against five related patents within a family of eight U.S. patents asserted in parallel district court litigation.<sup>1</sup> In these coordinated challenges, Samsung has advanced more than forty grounds of alleged prior-art invalidity across multiple

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<sup>1</sup> U.S. Patent Nos. 9,338,348 (the “’348 Patent”), 9,661,226 (the “’226 Patent”), 10,009,537 (the “’537 Patent”), 10,659,682, 10,944,901 (the “’901 Patent”), 11,252,325 (the “’325 Patent”), 11,671,702 (the “’702 Patent”), and 12,250,452 (the “’452 Patent”) (collectively, the “Asserted Patents”) are asserted against Samsung in *SnapAid, Ltd. v. Samsung Electronics Co., Ltd. et al*, 2-25-cv-00378-RWS-RSP pending in the Eastern District of Texas. The parallel IPR proceedings are: IPR2025-01519 (challenging the ’901 Patent), IPR2025-01520 (challenging the ’702 Patent), and IPR2025-01521 (challenging the ’325 Patent). The parallel PGR proceeding is PGR2025-00083 (challenging the ’452 Patent).

PTAB proceedings. Yet here, as in its other petitions, Samsung has failed to develop any ground with the rigor, specificity, and evidentiary support required to warrant institution.

The '682 Patent claims a real-time image quality assessment framework that integrates diverse quality indicators (QIs) from multiple sensor and computational domains, can assign each a confidence level, and weights them to calculate a Total Quality Indicator (TQI). Unlike the manual approaches described in the prior art, the '682 Patent can adjust QI relevance using cross-QI dependencies, confidence levels, probability models, and historical data.

Samsung's cited references describe conventional approaches and fail to disclose the integrated framework and design claimed in the '682 Patent. In particular, they do not teach or suggest per-indicator weight estimation or the calculation of a total quality value that incorporates the obtained values of specific quality indicators, their associated weights, and historical values from previous frames, among other features. The cited references also omit numerous limitations relating to quality-indicator dependencies and the adaptability of the claimed framework, including the use of historical data, probability models, and sensor-error estimates.

Samsung also fails to provide any adequate motivation to combine its cited references to achieve the claimed invention. The rationale offered consists of generic

assertions that the references share a broad goal of improving image quality, without any claim-specific or evidence-based explanation for why a skilled artisan would integrate their features in the manner alleged. Moreover, the limited “reasoning” conflates a speculative assertion that multiple references *could* be combined with the distinct requirement to demonstrate that a person of ordinary skill in the art *would* have been motivated to make such a combination. This conclusory approach, stitching together disparate elements without articulating a credible, non-hindsight reason for the combination, is precisely the type of reconstruction the Federal Circuit has cautioned against. Accordingly, the Petition fails to demonstrate a reasonable likelihood of prevailing on its obviousness challenge.

The Petition likewise advances contradictory positions on claim scope. In district court, Samsung contends that the very claim phrases it applies here are indefinite and “do not have a meaning that can be clearly determined from the patent.” In this IPR, however, it purports to apply the plain and ordinary meaning of those same phrases without explanation, mapping them to alleged prior art disclosures without offering the Board any guidance on claim construction. The Petition also ignores the corrected claim language issued by the Office’s Certificate of Correction, omitting limitations from the independent claims.

Viewed as a whole, the Petition glosses over the actual claim requirements, sidesteps its own conflicting positions, and substitutes conclusory assertions for the

detailed, claim-specific analysis the law demands. Combined with Samsung's overlapping challenges and litigation tactics, these substantive and procedural deficiencies create cumulative circumstances that weigh strongly in favor of denying institution for all challenged claims of the '682 Patent.

## **II. The '682 Patent**

The '682 Patent is directed to systems and methods of performing real-time assessment of picture or video quality by aggregating various quality indicators, often derived from both image analysis and device hardware sensors, to generate a quality score and provide immediate, actionable guidance or assistance to the user during the capture process. Specifically, the '682 Patent describes a comprehensive, real-time image quality assessment system that:

- obtains multiple, diverse quality indicators (QIs) (technical, compositional, contextual, semantic);
- integrates data from an array of device sensors (e.g., accelerometer, gyro, image sensor, GPS, step counter) in real time;
- obtains per-indicator confidence values, including, for example, values based on sensor reliability, historical stability, and contextual agreement/disagreement;
- assign or adjust the influence (weighting) of each QI in the overall total quality indicator (TQI), enabling robust, context-aware image

assessment and control;

- provides user and/or system-initiated real-time feedback (text, icon, audio) and actionable suggestions for capture improvement based on which QIs are subpar; and
- supports both automatic and user-initiated image (and video) capture, conditionally based on real-time, sensor-fused quality thresholds.

### **A. Challenges of Previous Systems**

The '682 Patent belongs to a family of U.S. patents with the common title of “Real Time Assessment of Picture Quality” that claims priority back to October 2012. Around October 2012, cell phone camera technology was rapidly maturing past basic snapshot quality with the focus shifting toward advanced sensor technology and the initial integration of advanced mechanical features, such as Optical Image Stabilization, establishing smartphones as a credible challenger to consumer point-and-shoot cameras. *See, e.g.*, Ex. 2027, 2028, 2029. This period was right at the onset of the smartphone camera uptake: “by 2011 more than a quarter of all photographs captured were taken using smartphone cameras. By 2015, over one trillion photos were being captured each year, with the vast majority of them coming from smartphones.” *See* Ex. 2027.

The specification of the '682 Patent provides a robust background explaining both the issues in the art at the time of the invention as well as the conventional

technology. With the onset of improved camera technology within widely adopted mobile phones, nearly everyone has a decent camera readily available to them in a moment's notice. At the time of the invention of the '682 Patent, however, while cameras had auto modes and functionality, they "still rel[ied] on the camera user to assess a picture's quality, either at the time of taking the picture, or at a later stage." Ex. 1001 at 1:29–33. To obtain a quality picture, users would end up taking numerous pictures and then later have to go back and select or favorite the "best." *Id.* at 1:33–35. But this manual process was inefficient as it involves the unnecessary taking of extra photos (which take up memory) and required the user to go back and manually identify the "best" photo of the series, potentially delete the others, and then there still may be some post-processing required. The invention of the '682 Patent solves these inefficiencies by better utilizing and implementing a process of getting a quality image in one take, as explained in greater detail below.

The specification and priority provisional applications identify and incorporate by reference numerous articles and patent references describing the "conventional technology" at the time of the invention. Ex. 1001 at 1:36–2:4, 10:25, 14:41–43, 15:24–26, 15:55–58, 15:63; Ex. 2005 at 1. The background references do not teach combining and adaptable technical indicator metrics in the comprehensive and contextually adaptive fashion as in the '682 Patent. *See* Ex. 1001 at 2:37–62. Ultimately, neither the background references nor the alleged challenging prior art

teach or suggest, *inter alia*, adaptive quality indicator weighting, confidence scoring, and aggregation as provided in the invention.<sup>2</sup>

### **B. The Invention of the '682 Patent**

The '682 Patent discloses systems and methods for real-time assessment of picture quality that integrate camera hardware with multiple sensors, such as image sensors, accelerometers, gyroscopes, GPS modules, step counters, and autofocus lenses. These components work together to produce quality indicators (QIs) that reflect various aspects of image capture conditions.

The '682 Patent describes that conventional approaches were typically applied isolated QIs and manually adjusted weights:

Prior art has used certain independent quality indicators, each giving a quality of one particular aspect of a picture, for a given picture. Some try to quantify the quality by means of a total quality indicator.

$$QI_{\text{total}} = \sum_{i=1}^n QI(t)_i$$

Where the number of quality indicators (QI), and t is the time of test.

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<sup>2</sup> Notably, Samsung does not attempt to distinguish the alleged prior art it cites against the Challenged Claims from the background references already cited by the patent specification and considered by the Office.

Some implementations use a weight function in computation, but the weight is either constant or can be change [sic] by the user manually.

$$QI_{\text{total}} = \sum_{i=1}^n QI(t)_i * w_i(t)$$

However, in this invention, the weight of one indicator will take into account data from other quality indicator/s e.g. their quality indicator value, weight, confidence level (explained forthwith) in them and their previous value, weight and confidence level.

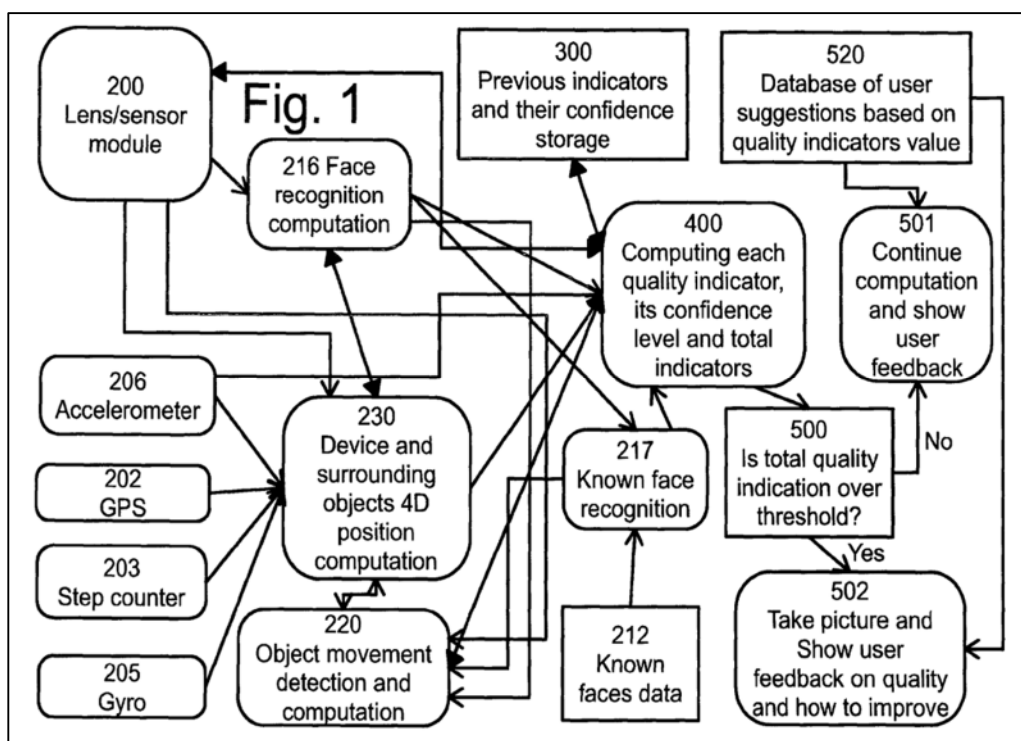
Ex. 1001 at 2:37–62; *see also, id.* at 8:7–9 (“When prior art computes a quality indicator value, it was done without taking into account the possibility of error in the computed QI”); *see also supra* § II.A.

Unlike prior art systems, the invention of the '682 Patent can apply adaptive weighting in which the weight assigned to a given QI incorporates data from other QIs, including their measured values, assigned weights, confidence levels, and historical data. *See* Ex. 1001 at 2:49–62, 8:7–9.

The confidence level for each QI can be calculated from factors such as potential sensor error, statistical probability, historical performance data, and contextual scene information. Statistical measures such as variance over time and disagreement between multiple sensors or QIs are used to adjust the relevance of each indicator in real time. Reliable indicators can be given greater influence, while

less reliable ones can be down-weighted or disabled altogether. This adaptive weighting prevents flawed measurements from degrading the overall Total Quality Indicator (TQI).

Figure 1, replicated below, is an exemplary functional block diagram illustrating components of a system and method for real time assessment of picture quality as disclosed by the patent:



Ex. 1001 at Fig. 1.

Available sensors provide raw data to a central processing component (400), which obtains individual QIs, determines confidence levels, and synthesizes them into the TQI. The processing component receives three broad categories of inputs:

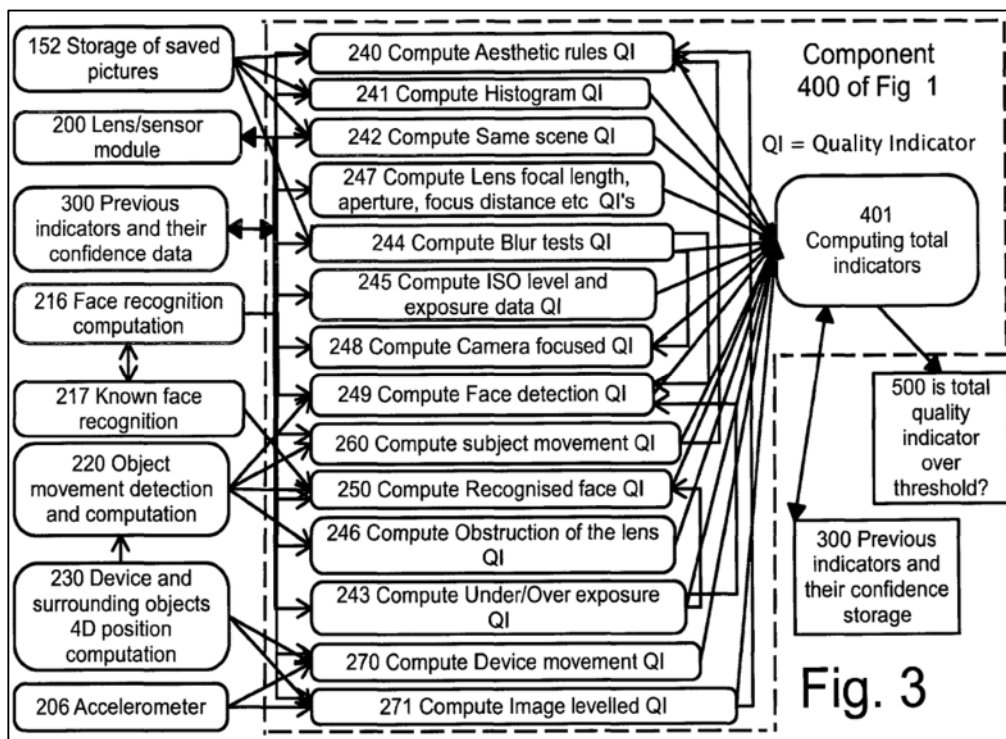
1. Raw hardware sensor data, such as lens and image sensor readings,

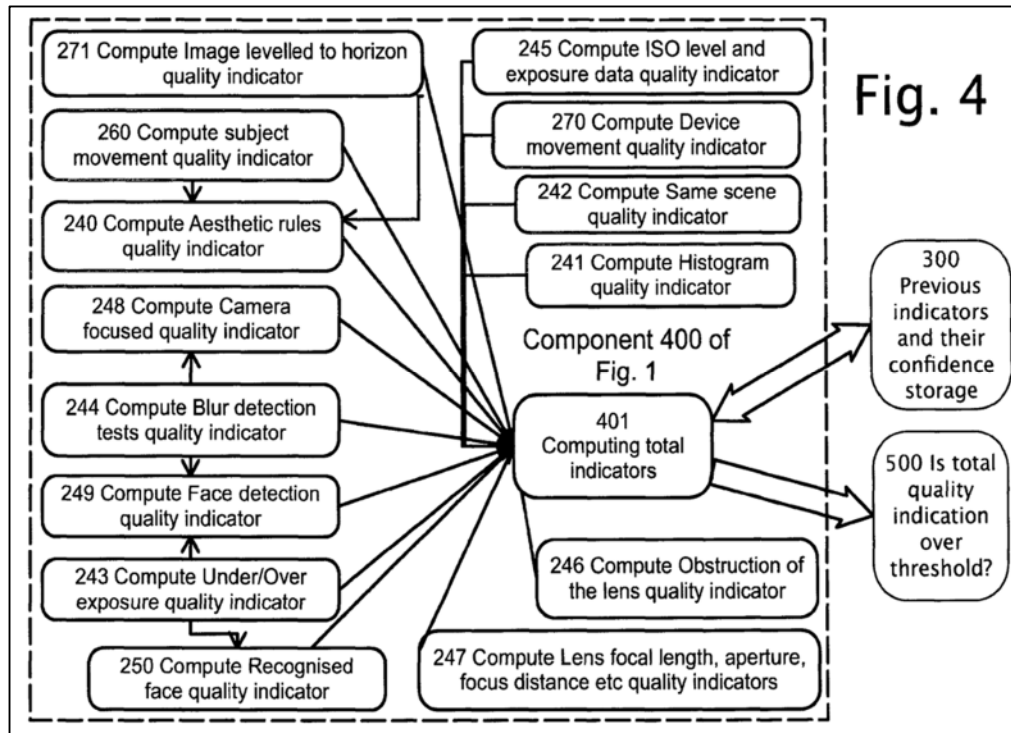
accelerometer and gyroscope measurements, GPS location, and step counter activity. *Id.* at Figs. 1 and 2 (illustrating Lens/sensor module 200, Accelerometer 206, GPS 202, Step counter 203, Gyro 205).

2. Computational inputs, including scene recognition tasks like face detection, face recognition, object movement detection, and same scene recognition. These functions depend on sensor data but add a higher level of analysis. *Id.* at Fig. 1 (Known faces data 212, Face recognition computation 216, Known face recognition 217, Object movement detection and computation 220, Device and surrounding objects 4D position computation 230), Fig. 4 (Compute Same Scene quality indicator 242), 8:33–35 (“Other examples may be comparison to a similar image for same scene recognition, as objects have moved or just look similar”), 13:60 (“a scene with face recognition”), 14:9–10 (“If the image sensor or operating system supports scene recognition/scene mode, or object recognition is present”).
3. Historical and contextual data, such as stored prior QI values and confidence levels, enable detection of anomalies and refinement of current measurements. *Id.* at Fig. 1 (Previous indicators and their confidence storage 300), 8:40–41 (“previous data can aid in computation of a better confidence level”), 9:49–56 (describing previous frames data and that the “confidence level is a function of old values inherited by virtue of distribution formula  $N(t)$ . So if

the QI value is significantly different then expected, the QI value's confidence level may drop thereby bypassing a current QI that may be problematic.”). These historical/contextual inputs are mathematically incorporated into current scoring in certain embodiments, enabling temporal confidence modeling.

Figures 3 and 4, replicated below, detail how the processing component uses these inputs in cross-QI computational dependencies, resulting in a more accurate and context-aware TQI.





*Id.* at Figs. 3 and 4.

The TQI can be compared against predefined thresholds to control camera behavior. For example, the system may delay capturing a photo until the TQI or certain QIs with sufficient confidence exceed the threshold or until a timeout occurs. *Id.* at Fig. 1 (Is total quality indication over threshold? 500), 17:33–36. This ensures photos are taken only when conditions support high quality. The invention also generates real-time feedback for the user based on QI values, offering targeted suggestions to improve the next shot. *Id.* at 17:60–63 (“user may choose to get suggestions from the application on how to improve the next shot. The application may use the quality indicators and their correlation [to provide suggestions].”), 3:36–39; *see also id.* at Fig. 1 (Continue computation and show user feedback 501, Take

picture and Show user feedback on quality and how to improve 502, and Database of user suggestions based on quality indicators value 520).

The specification provides various examples of how some “quality indicators and their confidence levels may depend on other QI data.” *Id.* at 16:32–33; *see also id.* at 15:49–16:39 (listing various examples). While the examples are provided as ways to implement “a total indicator that is dependent on quality indicators, their confidence levels and their relations,” the broader conceptual idea conceived by the inventor “is to enable a general formula as quality indicators are added or removed in some embodiments, or for different implementations with various levels of complexity and interconnections between QI.” *Id.* at 17:25–30.

As one example, the system can dynamically enable or disable certain QIs based on the performance of others. For instance, if both the device shake QI and the focus QI indicate poor quality, the aesthetic QI is excluded from the TQI calculation, even if the user has prioritized it. *Id.* at 2:62–3:2.

The contextual cross-evaluation of QIs also enables advanced functionality. When blur is detected, the system determines whether it results from poor focus or device movement, then responds accordingly—such as increasing shutter speed if the subject is moving or prompting the user to steady the camera. *Id.* at 3:43–48, 10:13–19. Scene recognition can influence QI weighting as well. For example, in a sunset scene, the system may reduce sensitivity to overexposure in sun-lit areas,

while in a scene with a detected face, it may increase the weighting of face exposure checks. *Id.* at 16:52–60.

The invention also teaches the use of aesthetic quality indicators in total quality computations. *Id.* at 3:1–2 (“[o]nce shake is low and focus is optimal, aesthetic QI may be used in total quality computations.”). Specifically, the invention teaches the implementation of aesthetic rules to enable the user to take a better-looking picture. The specification lists various heuristics that provide a means to improve the composition of a photograph, including, “rule of thirds, golden triangle, golden spiral, shapes and lines, amputation avoidance, visual balance, and diagonal dominance.” *Id.* at 15:44–48.

The calculation of these aesthetic quality indicators is used to provide suggestions to a user, including suggesting to the user that he “move from his current location to another location.” *Id.* at 15:66–67. For example, the Patent explains that “a lamp in the street behind a person at night will not be good even if it fits a golden rule,” and so, the Patent teaches:

Using data from Device/surrounding objects 4D position computation component 230, [the device] can assess distance to the person's face, say 2 meters, the distance to a lamp of 4 meters height 4 meters behind him, [and] can suggest to the user that he should move 2 steps to the right and one forward, tilting the device

20 degrees to the left if he wishes to achieve a better aesthetic QI score and a better total QI.

*Id.* at 16:4–12. The specification further teaches “testing background blurring,” which the Patent recognizes as an element that “may sometimes actually be desired.”

*Id.* at 13:58–59. The '682 Patent teaches that for “a scene with face recognition...a very small aperture...yields a bad quality [photo], whereas a wide aperture, say f2.8 on these conditions, yields a good quality [photo].” *Id.* at 13:60–64. The '682 Patent teaches providing a user with suggestions to achieve a good quality photo under such conditions.

Another inventive aspect is the consideration of statistical variability, probability factors, and sensor error when determining the relevance of each QI. The specification explains that each QI algorithm has assumptions and each sensor can produce measurement errors or drift. Unreliable or highly variable QI values may be reassessed or down-weighted. Sensor-specific error models, such as accelerometer drift or GPS location error ranges, are integrated into the confidence value calculation. *Id.* at 3:7–12, 8:7–18, 8:66–9:2. Probability modeling is also applied—object recognition may assign an 80% probability when four out of five target features are identified. *Id.* at 8:25–37. These probability and error considerations improve the reliability of QI weighting.

Historical data plays a key role in refining confidence calculations. If a current

QI value deviates significantly from expected historical trends, its confidence level may be reduced to avoid skewing the TQI. *Id.* at 9:52–56. The invention also incorporates deep learning algorithms and neural networks to enhance confidence level computation, particularly in areas such as object and face detection. *Id.* at 10:5–8. AI-driven pattern recognition allows the system to adapt QI weights based on learned correlations and scene characteristics.

By combining adaptable weighting, cross-indicator context, historical trend analysis, error and probability modeling, and AI-based enhancements, the '682 Patent delivers an adaptive, sensor-aware framework for picture quality assessment. These features directly address the deficiencies of prior art systems and result in a more accurate, reliable, and intelligent image capture process.

### **C. The Claims of the '682 Patent**

#### **1. Independent Claim 1**

Independent Claim 1 of the '682 Patent describes a “method for estimating quality of at least one image from a plurality of images.”<sup>3</sup> The method includes, inter alia, obtaining a first value (QI1), a second value (QI2), a third value (QI3), a fourth

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<sup>3</sup> A full listing of the Claims of the '682 Patent are provided in Appendix A. As shown in Appendix B, Samsung's petition fails to address the claim language based on the issued Certificate of Correction.

value (QI4), and a fifth value (QI5). The method further includes estimating a weight associated with each value. Claim 1 describes that QI1 is obtained “responsive to the device motion from the motion or location sensor,” QI2 is “associated with the digital camera,” QI3 is “associated with motion of at least one of said objects” where the captured image is analyzed for “detecting or recognizing one or more objects in the image,” QI4 is “associated with recognition of object characteristics,” and QI5 is “associated with an aesthetic quality of image based on a composition.” A total quality value is calculated “according to, or based on values QI1, QI2, QI3 QI4 and QI5 and weights c1, c2, c3, c4 and c5.”

Each of Claims 2 through 16 depends from Claim 1.

## **2. Independent Claim 17**

Independent Claim 17 of the '682 Patent describes a “method for estimating quality of at least one image from a stream of images from a video.” The method includes, *inter alia*, obtaining a first value (QI1), a second value (QI2), and third value (QI3). The method further includes estimating a weight associated with each value. Claim 17 describes that QI1 is obtained “responsive to the device motion from the motion or location sensor” and QI2 is “a combination of at least one of digital camera exposure, focus and under or over exposure.” Claim 17 further describes detecting or recognizing one or more objects in, or one or more characteristics of image or at least one of object characteristics by “analyzing the captured image via

deep learning algorithms.” Claim 17 goes on to describe the step of “calculating a total quality value according to, or based on values QI1, QI2, QI3 and weights c1, c2, c3 and previous values QI1, QI2, QI3 and previous weights c1, c2, c3 in said image stream.” At least one image is selected based on, at least in part, the calculated total quality value.

Claims 18–20 depend from Claim 17.

#### **D. Prosecution History**

The history of the eight U.S. Asserted Patents begins in October 2012. The family, which shares a common specification, claims priority to U.S. Provisional Application No. 61/717,216 filed October 23, 2012, and U.S. Provisional Application No. 61/759,643 filed February 1, 2013. On October 22, 2013, the Applicant filed a related PCT application (International Publication No. WO2014064690) before entering U.S. national stage prosecution.

In February 2014, the USPTO, acting as the International Searching Authority, issued an International Search Report and Written Opinion citing three references. Ex. 2030 at 43–44, 61–63. International Preliminary Reports on Patentability followed in January and April 2015. *Id.* at 64–78.

On April 20, 2015, shortly after receiving the international reports, the Applicant entered the national stage with U.S. Application No. 14/437,105. In May 2015, an Information Disclosure Statement (IDS) was filed identifying nine

U.S. patents, nineteen U.S. applications, and seven international publications. Ex. 2031 at 101–105. In August 2015, the pending claims were amended to “conform the claims of this U.S. Application to the claims that were found in the International Preliminary Report on Patentability with novelty, inventive step and industrial applicability.” *Id.* at 158–163. Following these amendments, the USPTO issued a Notice of Allowance in October 2015, and the issue fee was paid in January 2016. *Id.* at 171–177, 210.

The '348 Patent, the first U.S. patent in the family, issued from Application No. 14/437,105 on May 10, 2016, with seventeen claims. Independent Claim 1 is directed to a “digital image acquisition system,” and independent Claim 17 is directed to a “computer program product” adapted “to be executed to implement a digital image acquisition.” Ex. 2032.

On January 27, 2016, after paying the first issue fee for the '348 Patent, the Applicant filed U.S. Application No. 15/007,253 as a continuation. An IDS filed with the application identified twelve U.S. patents, twenty-one U.S. publications, and seven foreign patent documents. Ex. 2033 at 51–55. In February 2016, the Supplemental European Search Opinion in a related EP application issued, citing five references. Ex. 2034 at 2. In March 2016, a second IDS was filed with the USPTO identifying the five U.S. publication references from the EP search report, along with the Search Report and Opinion. Ex. 2033 at 88–89.

In November 2016, the USPTO issued a Non-Final Rejection, rejecting the claims as allegedly anticipated or obvious in view of U.S. Publication No. 2011/0075930 (“Cerosaletti”). *Id.* at 114–121. In January 2017, the Applicant filed amended claims in response. *Id.* at 146–152. A Notice of Allowance issued in February 2017, and the issue fee was paid in April 2017. *Id.* at 163–169. The ’226 Patent issued on May 23, 2017, with twenty claims. *Id.* at 197. Independent Claim 1 is directed to a “method for real-time estimating of an image quality” that includes obtaining multiple values and estimating multiple weights, calculating a total value, comparing the value to a threshold, and taking actions based on the total value relative to the threshold. Ex. 2035.

In April 2017, U.S. Application No. 15/582,722 was filed as a continuation of the ’226 Patent. Two IDSs were filed contemporaneously, identifying sixteen U.S. patents, twenty-eight U.S. patent publications, and seven foreign patent documents. Ex. 2036 at 54–64. The application received a Notice of Allowance in February 2018, and the ’537 Patent issued on June 26, 2018, with twenty claims. *Id.* at 770–777, 968. Independent Claims 1 and 10 are directed to “method[s] for estimating quality of a digital image frame having pixels.” Ex. 2037. Independent Claim 1 describes, *inter alia*, how the “second weight (c2) is partially based respective values of previous images in said video.” *Id.* Independent Claim 10, describes, *inter alia*, where the “first value (QI1) is associated with said camera

movement at the time of said image frame capture.” *Id.*

The '682 Patent, challenged in this proceeding, issued from U.S. Application No. 15/992,217, filed May 30, 2018. On July 29, 2019, the USPTO issued a Non-Final Office Action rejecting the then-pending claims under 35 U.S.C. §§ 102 and 103 as being anticipated or obvious over U.S. Publication No. 2012/0177352 (“Pillman”). Ex. 1016 at 94–101. The Examiner also confirmed consideration of eighteen U.S. patents, thirty U.S. patent publications, eight foreign patent documents, and four non-patent literature references submitted by SnapAid, including the references identified in the '682 Patent noted above in section II.A. *Id.* at 102–103, 105–107, 277–281.

In response, SnapAid submitted a revised set of claims. *Id.* at 285–92. The USPTO subsequently issued a Notice of Allowance, which included the Examiner's statement of reasons for allowance distinguishing the claimed methods from the cited prior art. *Id.* at 310–16.

The '682 Patent issued on May 19, 2020, with twenty claims, including independent Claims 1 and 17. *Id.* at 348. On January 13, 2025, the Applicant submitted a Request for Certificate of Correction, and the USPTO issued a Certificate of Correction to address certain mistakes of a typographical nature. *Id.* at 351–65.

On its face, the '682 Patent cites fifty U.S. patent documents, eight foreign

patent documents, and four other publications. Ex. 1001 at 1–2. These references were considered during the detailed prosecution of the '682 Patent and its related applications. The Petition does not explain how the eleven references it asserts differ in substance from those already reviewed by the USPTO.

### **E. Priority Date**

As noted above, the '682 Patent claims priority to US Provisional Application 61/717,216, filed October 23, 2012, and US Provisional Application 61/759,643 filed, February 1, 2013. Ex. 1001 at 2; Ex. 2005; Ex. 2006.

U.S. Provisional Application No. 61/717,216 (“the '216 Application”) describes a system and method for real-time assessment of picture quality using multiple sensors, such as image sensors, accelerometers, and gyroscopes, typically found in smartphones. Ex. 2005 at Abstract. The '216 Application explains that the invention combines data from multiple sensors and multiple quality indicators (QIs), and notes that there are many possible QIs depending on device capabilities and implementation. *Id.* at 3–4. Examples provided include:

1. Image leveled to the horizon
2. motion detection
3. camera is focused or still focusing
4. ISO level and how it is related to the specific sensor

5. Exposure time and how is it related to the scene taken  
if data available

6. Lens focal length, aperture, focus distance and sensor  
type and model.

7. Histogram evaluation

8. Image details (acutance, corners detected, DCT  
coefficient for high details, image sharpness)

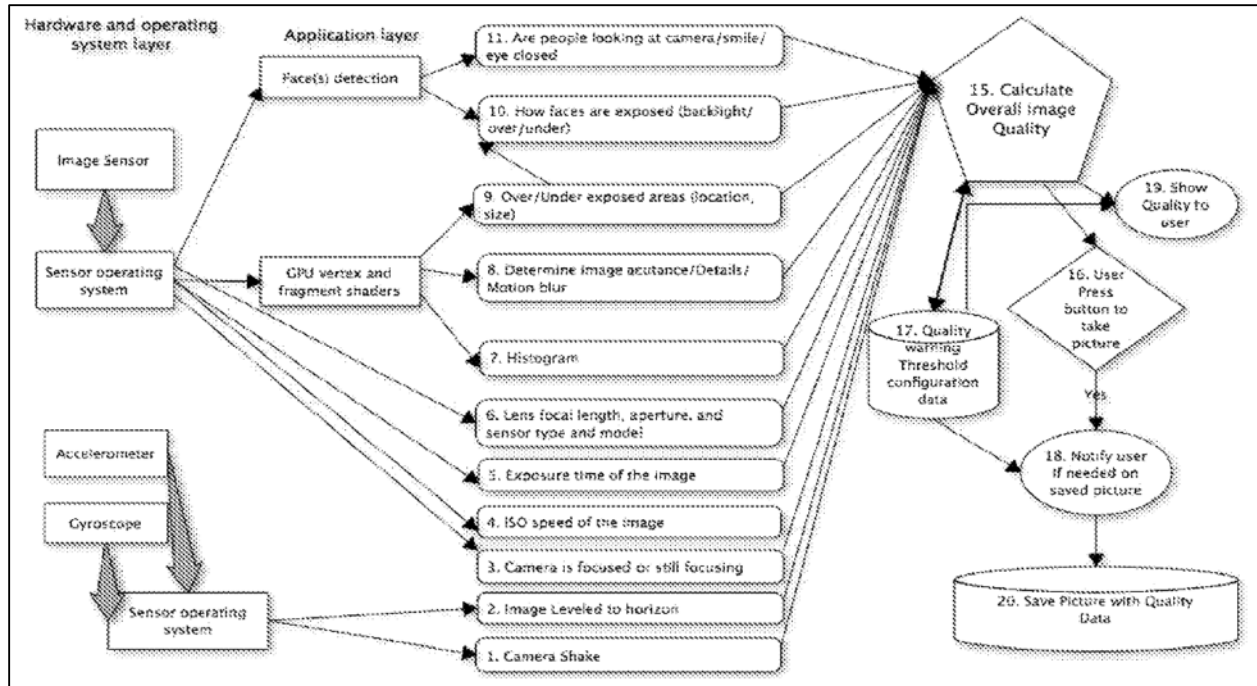
9. Under and over exposure area

10. Face detection and over or under exposed area near  
faces.

11. Face detection and is face is smiling and/or looking  
at camera

*Id.*

“Diagram 1,” replicated below, illustrates an exemplary embodiment of the  
invention:



*Id.* at 2.

The '216 Application describes sending data from a hardware layer that includes sensors such as the image sensor and movement sensors like an accelerometer and a gyroscope. *Id.* at 3. The sensors feed data to the operating system and an application layer, which can perform detection of subjects or objects within an image. *Id.* Examples in the '216 Application include detection of faces, with the note that “Face detection can be made in the operating system or application layer.” *Id.* at 2.

The '216 Application explains that hardware capabilities may vary between devices, and therefore some devices may not include all possible quality indicators or may be unable to process certain detailed indicators due to slower hardware. *Id.* at 4. Devices with more advanced sensors or processing systems can support

additional quality indicators suited to their capabilities.

A novel aspect described in the '216 Application is the combination of separate quality indicators to generate a total quality indicator, where “the formula [for] a weight function of one indicator will take into account the data from another quality indicator.” *Id.* at 5. A specific example describes how face detection data “can be used in combination with the under/over exposure area calculated before, to determine if the faces are under or over exposed, or more likely if there is a particular over exposed area near the face.” *Id.* at 4. In that embodiment, “the average luminance of the face is calculated” and, if below a threshold, “this may indicate the face is underexposed (backlight),” resulting in a low quality value for the “face underexposed” indicator. *Id.* This example illustrates one way in which data from one quality indicator can be combined with another to refine the total quality indicator; other comparable combinations and refinements would be apparent to a person of ordinary skill in the art based on the disclosure.

The '216 Application also describes providing feedback to the user based on the total quality indicator. *Id.* at 5. For example, the system may indicate when the TQI is below a minimum threshold or automatically save a picture without requiring the shutter button to be pressed. *Id.* The '216 Application further explains that “the user may choose to get suggestions from the application on how to improve the next shot” and that “the quality indicators [can be] used [to] suggest to the user how to

improve the picture he is taking.” *Id.*

Regarding the priority date, the Petition asserts without any analysis that “neither provisional provides support for all the limitations of any Challenged Claim.” Pet. at 6. Petitioner quotes a single limitation from independent Claim 1 and one from independent Claim 17 but offers no substantive explanation. *Id.* The accompanying ninety-one-page declaration from Dr. Dan Schonfeld likewise does not address the priority date, stating only that he was “asked to assume that the priority date of the alleged invention recited in the ’682 patent is at the earliest October 23, 2012.” Ex. 1003 at 1. Ultimately, Petitioner does not meaningfully challenge the priority of the ’682 Patent. *See, e.g., Am. Honda Motor Co., Inc. v. Neo Wireless LLC*, IPR2023-00797, Paper 29 at 17–18 (Sep. 3, 2024) (rejecting Petitioner’s priority date challenge where “despite ‘written description’ being a question of *fact*, and despite having its own technical expert...at the ready, Petitioner [did] not direct [the Board] to any evidence supporting [its] plain attorney arguments” on why the “[p]rovisional [application] allegedly does not explicitly or *inherently* disclose the subject limitation to the *skilled artisan*.”).

### **III. The Alleged Prior Art**

The Petition asserts ten proposed grounds of unpatentability asserting eleven alleged prior art references:

- Ground 1A alleges obviousness of Claims 1, 2, 5–8, 11, and 14–16 over

the combination of Anon, Takeuchi, and Jasinski;

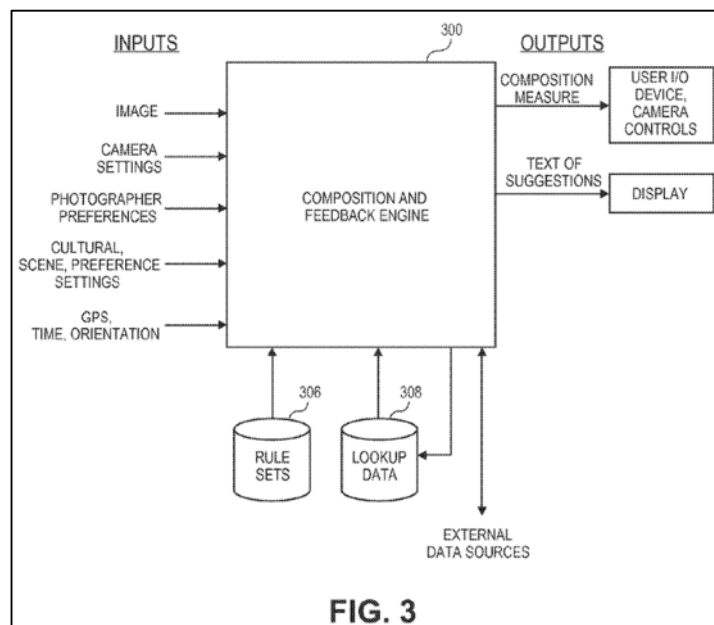
- Ground 1B alleges obviousness of Claims 17, 19, and 20 over the combination of Anon, Takeuchi, Jasinski, and Aisaka;
- Ground 1C alleges obviousness of Claim 3 over the combination of Anon, Takeuchi, Jasinski, and Alhadeh;
- Ground 1D alleges obviousness of Claims 4 and 9 over the combination of Anon, Takeuchi, Jasinski, and Ramesh;
- Ground 1E alleges obviousness of Claim 10 over the combination of Anon, Takeuchi, Jasinski, and Steinberg;
- Ground 1F alleges obviousness of Claim 12 over the combination of Anon, Takeuchi, Jasinski, and Liu;
- Ground 1G alleges obviousness of Claim 13 over the combination of Anon, Takeuchi, Jasinski, and Cheate;
- Ground 1H alleges obviousness of Claims 14 and 15 over the combination of Anon, Takeuchi, Jasinski, and Yang;
- Ground 1I alleges obviousness of Claim 18 over the combination of Anon, Takeuchi, Jasinski, Aisaka, and Ishiwata;
- Ground 1J alleges the obviousness of Claims 19 and 20 over the combination of Anon, Takeuchi, Jasinski, Aisaka, and Yang.

Pet. at 4.

Every ground relies on at least the combination of Anon, Takeuchi, and Jasinski. No reference, alone or in combination, renders obvious the combination of claim limitations recited in the '682 Patent. Moreover, the references are largely duplicative of the conventional technology already known in the art and already considered by the Office during prosecution of the '682 Patent and related applications.

### A. Anon

Anon is US Patent No. 8,508,622, which issued on August 13, 2013 and is assigned on its face to Disney Enterprises, Inc., and describes certain embodiments of an image capturing device incorporating a “composition and feedback engine.” Ex. 1004. Figure 1 depicts an example of the composition and feedback engine:



Anon provides that the engine can receive two types of inputs:

- Intrinsic inputs, or image-based characteristics, which include data from the image sensor, camera settings (such as f-stop, aperture, shutter speed), and characteristics derived from the image itself (such as indication of where a subject is located within an image or an “energy” measure of the image). *Id.* at 3:53–59, 4:4–23.
- External inputs, or external characteristics, which are independent of pixel color values and may include camera-specific parameters (such as location, time of day, and camera orientation), photographer-specific preferences (including possible use of a “training set”), and cultural preferences (such as preferred color combinations). *Id.* at 2:16–28, 3:59–62, 4:24–55.

In described embodiments, a “composition measure” is computed and, in some cases, feedback may be provided to the user. *Id.* at 1:59–2:8, 7:55–56. However, there is no specific method, formula, or algorithm for determining the composition measure or performing such balancing disclosed. *See id.* at 8:32–35.

Anon states:

the characteristics that are used to judge a properly composed image often depend upon the type of image that is sought to be captured. In other words, the characteristics that define what is ‘a good image’ are highly dependent upon the photographer's intent.

...

Context is useful for suggestions, since parameters for what would be a good shot might vary between, say, a Disney theme park, rural Montana, or a snow covered peak, as well as varying by location, orientation of the camera, time of day, etc.

*Id.* at 8:15–9:44. Anon further provides that, when there is insufficient contextual information, the system can separately optimize “low-level characteristics” such as light, focus, aperture, and depth of field. *Id.* at 9:64–67.

Anon does not disclose obtaining multiple quality indicators from distinct domains and estimating a separate weight for each such indicator, nor calculating a total quality value according to those individually estimated weights. Anon also does not teach incorporating historical quality indicator or weight values, and it contains no disclosure of deep-learning or neural-network algorithms for computing quality indicators or total quality values.

## **B. Takeuchi**

Takeuchi (US 2010/0149361, published June 17, 2010, assigned to Nikon Corporation) describes a camera system for evaluating a series of images captured in rapid succession, such as in a burst or continuous shooting mode. Ex. 1005 at Abstract; ¶¶[0006]–[0007], [0089], [0156]. Multiple images are stored in a buffer and assessed based on how the subject changes over time, using characteristics such

as motion vectors, defocus amounts, and main subject location. *Id.* at ¶¶[0007]–[0009], [0097], [0121]–[0122], [0129], [0139]–[0140], [0153].<sup>4</sup>

Images are segmented into blocks, with motion vectors calculated between consecutive frames and assembled into histograms (frequency distributions) of movement patterns; similar histograms are generated for defocus changes. *Id.* at ¶¶[0097], [0112]–[0114], [0121]–[0123], [0172], [0182]–[0183], [0129]. The number, magnitude, and location of peaks in these distributions are metrics for scoring image quality, and scene-specific rules may prioritize concentrated or dispersed motion depending on the subject matter. *Id.* at ¶¶[0011], [0123]–[0124], [0127], [0163]–[0164], [0178], [0210]. After the image evaluation portion, the system may select at least one image with evaluation results equal or above a predetermined threshold value. *Id.* at ¶¶[0028]–[0029], [0189]–[0203].

Takeuchi does not disclose obtaining multiple quality indicators from distinct domains, estimating a separate weight for each such indicator, or calculating a total quality value from those individually estimated weights. Takeuchi's model-based updates do not perform the claimed quantitative integration of historical QI and weight values into a current total quality value, and it contains no disclosure of

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<sup>4</sup> The '682 Patent recognizes that "There are many methods of computing a motion vector." Ex. 1001 at 11:31.

deep-learning or neural-network algorithms for computing quality indicators or total quality values.

### **C. Jasinski**

Jasinski is US Patent Application Publication No. 2012/0201427, published August 9, 2012. Ex. 1013. Jasinski describes methods for estimating subject motion between image frames and using that motion estimate to determine optimal image capture settings. The approach involves capturing at least two digital images of a scene at different times, designating one as a reference image, and dividing the images into multiple image regions. *Id.* at ¶¶[0019]–[0023], [0092]–[0094]. For each region, the system shifts it within the non-reference images according to a plurality of spatial offsets, computes merit function values indicating differences between the shifted regions and the reference region, and fits a fitting function to these merit values to achieve sub-pixel motion estimation accuracy. *Id.* at ¶¶[[0023]–[0028], [0096]–[0106]. The camera then determines a combined motion estimate by forming a weighted combination of local motion estimates from all regions, with weighting coefficients assigned based on factors such as region position, image detail, brightness, and confidence in the motion calculation. *Id.* at ¶¶[[0028]–[0031], [0120]–[0127].

Jasinski's weighting approach is limited to motion-estimation regions within a single analytic domain, and does not disclose obtaining multiple quality indicators

from distinct domains, estimating a separate weight for each such indicator, or calculating a total quality value from those individually estimated weights.

#### **D. Aisaka**

Aisaka is US Patent Application Publication No. 2010/0246939, published September 30, 2010. Ex. 1007. Aisaka describes an image processing apparatus and associated learning apparatus for evaluating whether a subject in an image appears sharp, and for selecting “best shot” images based on that evaluation. The system detects a subject region in an input image by generating multiple information maps (luminance, color, edge, face, and motion) from the image (*id.* at ¶¶[0058]–[0063], [0113]–[0115]) and combining them with predetermined or learned weights to produce a subject map (*id.* at ¶¶[0116]–[0119], [0268]–[0270]). Metrics are combined to produce a score for the image (*id.* at ¶¶[0066], [0124]–[0126]), which can be used to automatically select images as the “best shot” if the score exceeds a threshold (*id.* at ¶¶[0056], [0126]–[0128]).

Aisaka further discloses a learning apparatus that uses neural-network-based learning to adjust the weights applied to the various information maps in generating the subject map. *Id.* at ¶¶[0268]–[0270], [0272]–[0301]. This learning process uses labeled training images to iteratively update difference weights, information weights, and subject weights via forward and back-propagation steps. *Id.* at ¶¶[0272]–[0299], [0304]–[0364].

Aisaka's deep-learning approach is limited to optimizing weights for feature maps within a single subject-detection task and does not disclose obtaining multiple quality indicators from distinct domains, estimating a separate weight for each such indicator, or calculating a total quality value from those individually estimated weights. Aisaka also does not teach integrating historical quality indicator or weight values into the calculation.

#### **IV. Level of Skill in the Art**

For purposes of this Preliminary Response, SnapAid submits that a person of ordinary skill in the art ("POSITA") at the time of the invention of the '682 Patent would have possessed at least a bachelor's degree in electrical engineering, computer science, or a related field, and at least one year of experience with digital imaging systems, including image processing and analysis.

An individual with more industry experience but a different formal education could still be of ordinary skill in the art if that additional experience relates to image processing. Likewise, an individual with less industry experience but with a focus on image processing in their education could also be of ordinary skill in the art.

A POSITA would have been familiar with the basic operation of image sensors, camera modules, and auxiliary sensors used in image capture, as well as the design and use of image quality metrics. The POSITA would also be familiar with fundamental aspects of photography, like composition, subject, exposure, aperture,

shutter speed, ISO. This level of skill is appropriate given the nature of the '682 Patent, which is directed to real-time picture quality assessment integrating camera hardware with multiple sensors and applying dynamic weighting to quality indicators.

## **V. Claim Construction**

### **A. Petitioner's Failure to Explain Different Claim Construction Positions Warrants Denial.**

In its Petition, Samsung states that “terms in the Challenged Claims need not be construed” and proceeds to argue obviousness under the alleged plain and ordinary meaning of the claim language. The Petition does not identify a proposed construction for any claim term other than the alleged plain and ordinary meaning, which it does not define. Neither the Petition nor Dr. Schonfeld's declaration expresses any difficulty in understanding the scope of the '682 Patent's claims.

In stark contrast, in its recently served district court Invalidity Contentions, Samsung asserts that all twenty claims of the '682 Patent are indefinite because they “do not have a meaning that can be clearly determined from the patent.” Ex. 2038 at 238–239. Samsung specifically identifies four phrases it contends are indefinite:

- “calculating a total quality value” (limitations 1.k and 17.g);
- “aesthetic quality of image based on composition” (while this phrase does not appear in the claims, Samsung appears to be referencing claim limitation 1.i, which recites, “obtaining a fifth value (QI5) associated with

an aesthetic quality of image based on a composition”);<sup>5</sup>

- “a combination of at least one of digital camera exposure, focus and under or over exposure,” (claim 16 and limitation 17.c); and
- “wherein the acting comprises affecting the digital camera in response to the total value” (while this phrase does not appear in the claims, Samsung appears to be referencing claim 11, which recites “wherein the acting comprises affecting the digital camera in response to the total quality value”).<sup>6</sup>

*Id.* at 239; *see also*, Appendices A & B.

In the Petition, however, Samsung maps each of these phrases to alleged prior art teachings, purportedly applying the plain and ordinary meaning without hesitation. *See, e.g.*, Pet. at 30 (“Anon and Takeuchi when considered in combination

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<sup>5</sup> As explained in greater detail below in Section VI.A, Samsung’s recitation of the claims appears to fully account for the Certificate of Correction issued in the ’682 Patent’s file history. In the District Court, Samsung alleges the claim is indefinite without addressing the corrected language. Here, it alleges the prior art teaches the limitation, yet again without addressing the correction. Failure to address the actual claim language is, by itself, a sufficient basis to deny institution.

<sup>6</sup> *See supra*, n.5 (same).

would have taught a POSA to calculate a total quality value..."); Ex. 1003 ¶87 ("It would have been obvious to a POSITA that the combination of Anon and Takeuchi disclosed calculating a total image quality value...").

The Director has made clear that when a petitioner advances different positions before the Board and a district court, the petitioner must explain why those different positions are warranted. *Tesla, Inc. v. Intellectual Ventures II LLC*, IPR2025-00340, Paper 18 at 3–4 (informative); *Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 20 at 3–5 (precedential). Where, as here, the petitioner offers no such explanation, denial of institution is appropriate. See *American Airlines, Inc. v. Intellectual Ventures I LLC*, IPR2025-01055, Paper 11 at 13 (PTAB Nov. 21, 2025). Here, Samsung has offered no explanation for its positions.

Samsung's silence leaves the Board without guidance on how to construe the challenged claim limitations in light of its indefiniteness allegations. This inconsistency prejudices the Patent Owner and fails to satisfy the statutory requirement that the Petition identify the grounds of challenge for each claim. 35 U.S.C. § 312(a)(3). The Petition's obviousness arguments rest entirely on constructions that Samsung now claims are impossible to understand, undermining the credibility and sufficiency of its grounds.

For these reasons, Samsung's unexplained and contradictory positions in

parallel proceedings weigh strongly in favor of denying institution.

**B. No Specific Claim Construction is Warranted at this Time.**

For the purposes of this preliminary response, no other specific construction of any claim phrase or term is necessary at this time for the Board to find that Samsung did not meet their burden for institution. *See, e.g., Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)); *see also, Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review). SnapAid reserves the right to seek constructions of these terms in litigation or if institution is granted, and to further respond to any constructions that the Petitioners propose.

**VI. Petitioner Fails to Meet its Burden**

The Director should deny institution because Samsung has not met its burden to show a reasonable likelihood that it will prevail in establishing that any claim of the '682 Patent is unpatentable on any ground. The Petition fails to properly address the actual claim language as corrected by the Certificate of Correction, inadequately explains why a POSITA would have been motivated to combine the cited references in the manner alleged, and fails to establish that the cited references teach the full

scope of the challenged claims.

**A. The Petition Fails to Address all the Claim Limitations of any Claim of the '682 Patent.**

Under 37 C.F.R. § 42.104(b)(4), a petition must “specify where each element of the claim is found in the prior art.” Here, the Office issued a Certificate of Correction amending independent Claims 1 and 17, as well as dependent claims 5, 7, 8, 9, 10, 11, and 19. Ex. 1016 at 361. Under 35 U.S.C. § 255, “[s]uch patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.”

Because this IPR was filed after the Certificate of Correction issued, the challenged claims must be evaluated in their corrected form. Petitioner does not do so, and therefore fails to map the actual claim language to the cited prior art. *Compare* Appendix A (SnapAid's Claim Listing) *with* Appendix B (Samsung's Appendix Claim Listing showing errors). For example:

- Independent Claim 1 limitation 1.k requires “calculating a total quality value according to, or based on values QI1, QI2, QI3 QI4 and QI5 and weights c1, c2, c3, c4 and c5” (emphasis added). The Petition does not address this full requirement.
- Independent Claim 17 limitation 17.f requires “estimating a third weight (c3) associated with the third value.” The Petition does not map

the prior art to this element in Claim 17.

Because Petitioner fails to address all limitations in the claims as corrected, the Petition does not comply with § 42.104(b)(4) and should be denied. At a minimum, this failure weighs against institution and, when considered together with other deficiencies, favors denial. See *ipDataTel, LLC et al. v. ICN Acquisition*, IPR2018-01822, Paper No. 19 at 16–17 (Apr. 22, 2019) (denying institution where “the asserted grounds no longer address the language of the claims” after a certification of correction was filed).

**B. The Petition Fails to Adequately Explain Why a POSITA Would Combine the Alleged Prior Art as Suggested.**

Obviousness requires more than locating claim elements in multiple references. As the Supreme Court explained, “[a] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). A petitioner must show that a POSITA would have been motivated to consult the secondary reference as a whole for a specific reason, identify a teaching compatible with the primary reference’s objectives, and ensure that the overall disclosure of the secondary reference does not discourage the combination. *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (explaining that in *KSR*, the Supreme Court “[r]eject[ed] a blinkered focus on individual [prior art references]” and “required an analysis that reads the prior art in context”).

Here, the inventive concept of the '682 Patent is not merely the use of multiple “quality indicators” (QIs) or assigning weights to them, but the integration of diverse QIs into a unified, weighting framework that can adapt to varying conditions and contexts in real time by considering other QIs, confidence levels, probability models, sensor error estimates, and historical data. This adaptable framework as a whole, along with all the various specific limitations recited in the claims, such as specific cross-QI dependencies and historical or probability-based refinements, distinguishes the '682 Patent from prior art systems that rely on manual weighting, isolated QIs, or context-agnostic scoring.

The Petition never articulates why a POSITA would be motivated to combine the cited references to achieve this specific weighting framework. Instead, Petitioner cherry-picks individual features from disparate references and justifies the combinations with conclusory statements about analogous fields or broad goals such as “improving image quality” or “reducing user burden.” See Pet. at 18, 23. Such generalities are not a contemporaneous motivation in the art; they are reverse engineering from the claims, which is precisely the hindsight reconstruction condemned by the Federal Circuit. *Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1358 (Fed. Cir. 2023) (“We analyze whether prior art is analogous with the foresight of a person of ordinary skill, not with the hindsight of the inventor’s successful achievement.”) (internal quotations omitted). As the Federal Circuit has emphasized,

“it is insufficient to simply conclude the combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination.” *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

As explained below, this flaw is structural to Petitioner's approach and infects all proposed grounds. It appears in multiple forms throughout the Petition, including (i) using the claims as a blueprint to map QIs to disparate references without explaining how they would be integrated, (ii) relying on generic “shared goal” assertions that ignore the references' different technical purposes, (iii) offering alternative combinations grounded in circular “same function” reasoning, and (iv) invoking boilerplate “known technique” language without any factual nexus to the claimed invention. Each is a different manifestation of the same improper hindsight reconstruction, and each warrants denial of institution.

**1. The Petition uses the claims as a blueprint, mapping each QI to disparate references without explaining why the POSITA would integrate them.**

The Petition's combinations are not driven by any contemporaneous, claim-specific reason a POSITA would have had to make them, but by hindsight reconstruction using the '682 Patent as a roadmap. As the Federal Circuit has long recognized, “[d]efining the problem in terms of its solution reveals improper hindsight.” *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*,

139 F.3d 877, 881 (Fed. Cir. 1998).

The claims of the '682 Patent are directed to unifying multiple quality indicators into a weighted total quality value. Specifically, Claim 1 identifies five quality indicators:

- QI1: information responsive to motion or sensor data
- QI2: camera operation metrics
- QI3: object motion analysis
- QI4: object characteristic recognition
- QI5: aesthetic composition assessment

Claim 17 recites three quality indicators:

- QI1: motion/location sensor data responsive to device movement.
- QI2: a defined combination of camera parameters — exposure, focus, and under/over exposure.
- QI3: deep learning based object or characteristic recognition.

The '682 specification describes how these indicators are not merely aggregated, but are integrated into a single architecture in which the weight assigned to one QI can depend on other QIs, confidence levels, probability models, sensor error estimates, and historical data.

The Petition's approach is to identify each claimed QI in a different reference—with Anon as the primary and one or more secondary references such as

Takeuchi, Jasinski, or Aisaka—and assert that the combination is obvious because each reference “fits naturally” into the same broad field or goal of improving image quality. *See* Pet. at 19. In doing so, Petitioner never explains why a POSITA would select these specific indicators as a set, or how the different methodologies, such as real-time composition feedback (Anon), burst-mode motion scoring (Takeuchi), region-based exposure optimization (Jasinski), or neural-network subject maps (Aisaka), would be adapted to work together.

Petitioner's pattern of identifying claim elements in disparate references, asserting they share a broad goal, and declaring the combination obvious, is precisely the type of “blueprint” reasoning condemned by the Federal Circuit. *See In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (“The mere fact that the prior art could be modified ... would not have made the modification obvious unless the prior art suggested the desirability of the modification.”). Without a contemporaneous, claim-specific reason in the prior art to assemble these particular elements into the adaptive weighting framework of the '682 Patent, the Petition's combinations amount to reconstruction with the benefit of the invention as a roadmap.

This flaw underlies Petitioner's reliance on generic “shared goal” reasoning (§ VI.B.2), its circular “same function” rationale (§ VI.B.3), and its boilerplate “known technique” assertions (§ VI.B.4).

**2. The Petition's generic rationale that the references relate to image quality is inadequate given their different technical purposes and methodologies.**

Petitioner repeatedly relies on a generic rationale that the cited references all relate to image processing or improving image quality and therefore a POSITA would have been motivated to combine them. *See, e.g.*, Pet. at 19 (“fits naturally” ... “to improve similar devices in the same way”), 22 (“an explicit goal of both systems”), 23, 25 (“both systems are fundamentally concerned with improving the quality and usefulness of captured images”), 26, 47 (“aligned with the goals of both Anon and Takeuchi”).

But having a common goal or being analogous art is not enough to supply a reason to combine. The Federal Circuit has made clear that the motivation inquiry asks why a POSITA would be motivated to make the specific combination or modification of prior art to arrive at the claimed invention, not simply whether the references are in the same field or share a general objective. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018); *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015).

Here, each of the four leading references addresses a different technical problem with a different primary methodology:

- **Anon:** single-image composition feedback based on scene context, camera settings, and image characteristics, producing a composition

measure. *See supra*, § III.A.

- **Takeuchi:** burst-mode or continuous-shooting evaluation using multi-frame motion vector histograms and defocus metrics to select “best shots” post-capture. *See supra*, § III.B.
- **Jasinski:** per-region sub-pixel motion estimation from sequential images, combining local motion estimates using confidence- and brightness-dependent weights to adjust exposure and other capture settings for blur minimization. *See supra*, § III.C.
- **Aisaka:** post-capture subject detection and blur/sharpness scoring using neural-network-trained weighting of multiple feature maps to generate a subject map. *See supra*, § III.D.

These systems are not interchangeable modules for a single architecture; they are designed for different inputs, timing (real-time versus post-capture), and serve output objectives. Petitioner offers no explanation of how or why a POSITA would adapt these distinct approaches into the '682 Patent's integrated, adaptive weighting framework, which unifies multiple QIs in real time and can adjust weights based on other QIs and additional factors. Instead, Petitioner assumes that because each reference allegedly contains an element that can be mapped to a claim limitation, the combination would have been obvious. That is not the law. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024) (“It does not

suffice to simply be known. A reason for combining must exist.”).

Without a claim-specific, evidence-backed rationale for integration, the Petition's generic “shared goal” reasoning is conclusory. It does not explain why a POSITA would merge fundamentally different systems to achieve the claimed adaptive weighting.

**3. The Petition fails to explain why a POSITA would combine Anon with Jasinski or Anon with Takeuchi to achieve the same functionality.**

As explained above, the Petition relies on combinations of at least three references for every ground, with Anon serving as the primary reference and Jasinski or Takeuchi supplying alleged additional functionality. In multiple instances, Petitioner advances an alternative hedge: if Anon is found to teach the limitation, that ends the matter; but if not, the secondary reference purportedly fills the gap.<sup>7</sup>

The flaw in Petitioner's argument arises because, in these alternative scenarios, the Petition's stated motivation to combine is circular—it rests on the premise that the primary and secondary references already perform substantially the same function, and then uses that similarity as the reason to combine them. In doing so, Petitioner never identifies a problem in the primary reference that the secondary would solve, or a benefit in the secondary that a POSITA would have been motivated

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<sup>7</sup> As provided below, SnapAid disputes that either reference actually teaches or suggests the alleged limitations. *See infra*, § VI.C.1.

to import. Instead, it simply restates the overlap between them and declares that overlap to be the motivation.

For example, in addressing limitation 1.b (and the other claimed “estimating” steps), Petitioner asserts that Anon estimates a first weight associated with motion data, but “[t]o the extent that Anon is argued to not disclose dynamic estimation of weights, Jasinski remedies any deficiency.” Pet. at 16–17. Petitioner elaborates:

A POSA would have understood that using dynamic estimation of weights (as taught by Jasinski) as part of a weighted combination of parameters (as taught by Anon) would allow for accounting of changes in the reliability, relevance, and importance of parameters over different regions of the image or over time.

Pet. at 18.

In this proposed alternative scenario, Petitioner asserts that Anon does not teach “using dynamic estimation of weights,” despite Anon’s explicit disclosure that a “typical composition and feedback engine ... will consider more than one independent value for some characteristic of an image and provide recommendations that might not be optimal for one characteristic versus another characteristic” (Ex. 1004 at 5:26–30), that “parameters may be input into a fuzzy logic set, or the like, and an evaluation, e.g. weighted, combination of parameters may be performed by the composition and feedback engine” (*id.* at 8:32–35), and that “the

photographer is provided with real-time feedback” (*id.* at 3:22–26). Petitioner then asserts that Jasinski would supply the allegedly missing “dynamic estimation of weights” feature. Pet. at 17–18.

But Petitioner does not explain why a POSITA, faced with Anon’s alleged disclosure of using a weighted combination of parameters, would be motivated to incorporate Jasinski’s “computing weights for each image region dynamically, based on the current image data.” See Pet. at 17. Even in Petitioner’s alternative, Anon’s composition and feedback engine already provides real-time, weighted evaluation that adapts recommendations based on multiple inputs (functionality that Petitioner itself cites). The Petition’s stated motivation—to “account for changes in the reliability, relevance, and importance of parameters over different regions of the image or over time”—is a functionality that Petitioner asserts is already provided by both references. Without a specific technical reason why Jasinski’s per-region motion and brightness weighting would improve or modify Anon’s composition feedback engine, the rationale is conclusory and relies on the similarity of function as the reason to combine.

The same flaw appears in Petitioner’s treatment of object detection for limitation 1.e. Petitioner states that “Anon explicitly contemplates the detection and recognition of objects” and that “Takeuchi also makes extensive use of object detection.” Pet. at 20–21. If Anon already teaches object detection and weighting

based on subject position (Ex. 1004, 3:62–3:43), the Petition must explain why a POSITA would look to Takeuchi for that same general functionality, rather than simply relying on Anon. Petitioner does not address how Takeuchi's continuous-shooting motion vector analysis, designed for burst-mode post-capture scoring, would be adapted into Anon's single-frame, context-driven composition feedback engine. Again, the stated motivation relies on the fact that both references perform object detection, without identifying a specific improvement or compatibility that would prompt a POSITA to integrate them.

As the Federal Circuit has explained, where “both references independently accomplish similar functions ... a person having ordinary skill in the art ... would have no reason to combine the features of both devices into a single device.” *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012). Here, Petitioner's reasoning depends on hindsight knowledge of the '682 Patent's adaptive weighting framework, using the claims as a roadmap to connect otherwise distinct approaches. Without a claim-specific, evidence-backed rationale for integration, the proposed combinations lack the reasoned explanation required.

**4. The Petition's reliance on boilerplate “use of a known technique” language is conclusory and unsupported.**

Petitioner's particular combination of Anon with Jasinski fails for an additional reason. Petitioner's stated rationale is that “Jasinski's region-based weighting fits naturally with Anon's teaching that object and region detection

influences the weights of other quality characteristics” and that “this combination is the use of a known technique (Jasinski’s dynamic weights) to improve similar devices in the same way.” Pet. at 18–19. This reasoning is conclusory and lacks any claim-specific explanation or evidentiary support.

The PTAB has repeatedly rejected generic statements such as “use of a known technique to improve similar devices in the same way” when petitioners fail to provide a factual nexus between the known technique and the claimed invention. *See Klas Telecom, Inc. v. Arnouse Digital Devices Corp.*, No. IPR2020-01057, 2020 WL 6875596, at \*5 (P.T.A.B. Nov. 23, 2020) (finding inadequate the “use of a known technique to improve similar devices in the same way” where petitioner failed to offer “sufficient evidence or testimony regarding a reason for combining the known elements in the fashion claimed”).

Here, Petitioner does not explain how Jasinski’s alleged dynamic, region-based motion-estimation weighting—which is designed to optimize exposure time based on local motion and brightness—would be adapted into Anon’s composition feedback engine, which evaluates single-frame composition quality using scene context, camera settings, and image characteristics. These systems differ in inputs, timing, and purpose, and Petitioner offers no analysis of how their methodologies could be integrated to produce the ’682 Patent’s adaptive multi-QI weighting. Without that analysis, Petitioner’s rationale is exactly the type of

conclusory assertion the Board has rejected.

This is yet another manifestation of the same structural flaw addressed in above: Petitioner relies on generalized compatibility or similarity in function without providing a claim-specific, evidence-backed reason for the combination. Such hindsight-driven reasoning cannot support institution.

**C. The Proposed Combinations of References Fail to Teach or Suggest all the Claim Limitations the '682 Patent.**

The challenged claims of the '682 Patent require a quality-assessment framework that integrates multiple, diverse quality indicators (QIs) into a unified scoring process, with each QI assigned an estimated weight and those weighted QIs combined into a total quality value. The framework can operate across QIs from different domains, such as motion or location sensors, camera parameters, object analysis, and aesthetic composition, and in some embodiments further refines weighting by making a QI's weight responsive to the values or reliability of other QIs, adjusting weights based on sensor error or confidence levels, and incorporating historical QI data or probability models.

The Petition largely ignores this integrated, per-indicator weighting and calculation framework. Instead, it disassembles the claims into individual elements, points to generic disclosures of known components or weighting methods, and asserts that they can be combined. The cited references do not teach or suggest the claimed estimation of separate weights for each defined QI, nor do they disclose

calculating the total quality value according to those estimated weights and QIs. Because the calculation step depends on the proper estimating steps, the absence of any disclosure of the claimed estimating process necessarily means the cited art also fails to teach the calculation step as claimed.

This compounding deficiency pervades Petitioner's analysis. The subsections below address these gaps for each independent claim and explain why none of the cited references, alone or in combination, teaches or suggests the full scope of the claims.

**1. The Ground 1A combination of Anon, Takeuchi, and Jasinski fails to teach or suggest all limitations of Independent claim 1.**

Claim 1 requires, *inter alia*:

- Obtaining multiple QIs from distinct domains (motion/location sensors, camera metrics, object motion, object characteristics, and aesthetic composition).
- Estimating a separate weight for each QI.
- Calculating a total quality value from those weighted QIs.

Each of Claims 2, 5–8, 11, and 14–16 challenged in this Ground depends from Claim 1, along with Claims 3, 4, 9, 12, and 13. Because none of Anon, Takeuchi, nor Jasinski—alone or in combination—teach or suggest all the limitations of independent Claim 1, the Petition has failed to establish a reasonable likelihood that any of Claims 1–16 are unpatentable.

The Petition fails to show that the cited art teaches the specific estimating steps required by limitations 1.b, 1.d, 1.f, 1.h, and 1.j, or the calculation step required by limitation 1.k. These limitations call for estimating a weight for each distinct QI domain and then calculating a total quality value according to those individually estimated weights and QIs.

***a. None of Anon, Takeuchi, or Jasinski teach or suggest limitations 1.b, 1.d, 1.f, 1.h, and 1.j, as claimed.***

For limitations 1.b, 1.d, 1.f, 1.h, and 1.j, Petitioner repeatedly cites Anon's generic statement that a fuzzy-logic set may apply a "weighted combination of parameters" (Ex. 1004 at 8:32–35), without addressing the claim's requirement to perform separate estimating steps for each QI from its distinct source. See Pet. §§ VI.A.1.iii, v, vii, ix, and xi. But Anon's alleged disclosure of assigning weights to generic parameters reflects the same type of conventional fuzzy-logic weighting identified in the '682 Patent's background as prior art. See Ex. 1001 at 2:49–62. These approaches assign fixed or context-agnostic weights to generic characteristics, not per-indicator weights tied to heterogeneous sensor or analytical inputs.

Recognizing that Anon does not disclose dynamic per-indicator estimation, Petitioner turns to Jasinski. Pet. at 17–18. Jasinski's weighting is likewise inapposite. Petitioner cites to Jasinski's alleged disclosure of weighting image regions within a single frame for motion-estimation purposes, based on region attributes like detail, brightness, or position, and confidence in that motion calculation. *Id.* (citing Ex.

1013 at ¶¶ [0114, 0119–0122]); *see also supra*, § III.C; Ex. 1013 at ¶ [0118]. But this motion-analysis technique involving assigning weights “representative of the estimated relative importance of the *image regions* to a user” (Pet. at 17 (quoting Ex. 1013 at ¶ [0120]) (emphasis added)), is not the claimed process of estimating weights for multiple QIs from distinct domains and then combining them into a structured total-quality computation.

The Petition asserts that the combination of Anon and Takeuchi allegedly teaches the various claimed QIs, that the combination of Anon and Jasinski allegedly teaches weighting, and that a POSITA could simply apply the generic concept of weighting to each QI. But Claim 1 does not merely require that each QI have a weight — it recites estimating a weight for *each* QI, tied to its respective domain (limitations 1.b, 1.d, 1.f, 1.h, and 1.j). The cited art does not teach estimating a weight for motion/location sensor data, camera operation metrics, object motion analysis, object characteristic recognition, and aesthetic composition within a single integrated framework. Instead, Petitioner's approach isolates the QIs in one set of references and a generic weighting concept in another, without disclosing or suggesting the claimed integration of those elements into a unified total quality value calculation.

***b. None of Anon, Takeuchi, or Jasinski teach or suggest limitations 1.k, as claimed***

Because the calculating step in limitation 1.k depends on the use of

these estimated weights,<sup>8</sup> the absence of any disclosure of the claimed estimating steps necessarily means the cited art cannot disclose the calculation step as claimed. Claim 1 requires calculating the total quality value according to the five specific QIs and their associated estimated weights.<sup>9</sup> Petitioner does not identify any disclosure in which the total quality value is computed from these five defined QIs with their individually estimated weights, nor any reasoned explanation for why a POSITA would have selected this particular set of indicators and weights.

In sum, the Petition does not show any disclosure in which the five claimed QIs are each assigned an estimated weight tied to their respective domain and then combined within a single integrated framework to calculate the total quality value. The cited art separates the QIs from a generic weighting concept and relies on conventional approaches already acknowledged in the '682 Patent's background. Without teaching the claimed coordination of QIs and weights, the Petition fails to address the full scope of Claim 1, and its dependent Claims 2–16 likewise remain

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<sup>8</sup> “calculating a total quality value according to, or based on values QI1, QI2, QI3 QI4 and QI5 and weights c1, c2, c3, c4 and c5.” Appendix A.

<sup>9</sup> As explained in section VI.A, the petition fails to even articulate limitation 1.k as corrected. As such, the Petition also fails to substantively address the calculating step where the calculating is done in consideration of QI4.

patentable.

**2. The Ground 1B combination of Anon, Takeuchi, Jasinski and Aisaka fails to teach or suggest all limitations of independent Claim 17.**

Claim 17 applies the '682 Patent's quality-assessment framework to a video stream, requiring, *inter alia*:

- QI1: motion/location sensor data responsive to device movement.
- QI2: a defined combination of camera parameters — exposure, focus, and under/over-exposure.
- QI3: deep-learning-based object or characteristic recognition.

Each QI has an associated weight (c1–c3), and limitation 17.g requires calculating a total quality value (TQI) that incorporates both current QI/weight values and historical QI/weight values from previous frames, producing a temporal, context-aware score used to select at least one image from the stream.

Claims 19 and 20 challenged in this Ground depend from Claim 17. Because none of Anon, Takeuchi, Jasinski, nor Aisaka—alone or in combination—teach or suggest all the limitations of independent Claim 17, the Petition has failed to establish a reasonable likelihood that Claims 17, 19, and 20 are unpatentable. Moreover, Claim 18 depends from Claim 17; for the same reasons that Claim 17 is patentable, Claim 18 likewise remains patentable.

The Petition fails to address limitation 17.f entirely, leaving a gap in its mapping of the claim. *See supra* § VI.A. Because this limitation goes entirely

unaddressed, that omission alone is sufficient to conclude that Petitioner has not shown a reasonable likelihood of prevailing on unpatentability for Claim 17 or its dependent claims.

The Petition also fails to meet the historical-integration requirement of limitation 17.g. Petitioner relies on Anon's suggestion that its composition feedback "can equally apply" to video (Pet. at 40 citing Ex. 1004 at 3:2–10) and on examples where Anon uses prior subject position to suggest framing changes (Pet. at 49 citing Ex. 1004 at 8:28–31, 10:27–46). Petitioner also cites Takeuchi's evaluation of frame sequences based on motion vectors and deletion of low-scoring frames from a buffer. Pet. at 50 citing Ex. 1005 at ¶¶[0121], [0157], [0221]. But none of these disclosures teaches or suggests the claimed quantitative integration of historical QI and weight values into the current total quality value calculation.

In Claim 17, limitation 17.g requires mathematically incorporating "previous values QI1, QI2, QI3 and previous weights c1, c2, c3" into the calculation of the current TQI—a form of temporal confidence modeling where historical performance directly influences current weighting and scoring. This approach allows the system to reduce the impact of unreliable indicators by adjusting their weights based on historical variance, probability models, and prior sensor disagreements.

Anon's "previous data" references do not teach the claimed approach. Anon's use of prior information is limited to suggestions for composition adjustments (e.g.,

framing ahead of a moving subject, showing more sky for an interesting sunset) or to post-capture sorting/ranking of images for an album. For example, Anon describes “a data set of rules” that includes, in one example, “‘when located at the GPS coordinates of the front of Cinderella's Castle™ in Disneyland, suggest centering on the castle rather than rule of thirds.’” Ex. 1004 at 5:4–6. In another example, a rule in Anon’s rule set storage states: “for landscape images of large bodies of water, adjust the camera settings so that a pleasing amount of light would come from the water relative to the sky.” *Id.* at 7:21–24. There is no disclosure of mathematically combining prior QI values and their associated weights with current ones in a single calculation. Similarly, Takeuchi’s chronological motion-vector analysis does not integrate prior QI/weight data into the ongoing computation of a unified quality score.

The ’682 Patent’s historical integration is different: it uses quantitative historical QI and weight data as part of the formula for the current TQI, so that the scoring process is adaptive over time and responsive to past reliability. The absence of any such integration in Anon, Takeuchi, Jasinski, or Aisaka is an independent reason why limitation 17.g is not met.

Moreover, the Petition’s reliance on Anon for generic “weighted combinations of parameters” and Jasinski for dynamic weighting of image regions suffers from the same deficiency as in Claim 1: there is no disclosure of estimating

a separate weight for each claimed QI within a single integrated framework. Specifically, the cited art does not teach the estimating steps required by limitations 17.b, 17.d, and 17.f, nor the calculation step required by limitation 17.g. Anon's fuzzy-logic weighting is tied to generic image parameters, not to motion/location sensor data, camera-parameter combinations, and deep-learning outputs. Jasinski's coefficients are tuned for motion-region estimation, not multi-sensor quality scoring, and are not responsive to other QIs or their reliability. Aisaka's deep-learning subject-map weighting is purpose-built for blur/sharpness scoring of a detected subject region, not for integration into a multi-QI TQI calculation.

The cited art isolates the QIs in one set of references and generic or unrelated weighting methods in others, without teaching or suggesting the claimed coordination of those elements to produce a TQI that incorporates both current and historical QI/weight values. This separation means the calculation step in limitation 17.g cannot be met, because it depends on the proper per-indicator estimating steps and historical integration. Without a disclosure of this unified, adaptive framework, the Petition fails to address the full scope of Claim 17.

All of the foregoing demonstrates that the Petition fails to teach or suggest limitations 17.b, 17.c, 17.d, 17.e, 17.f, 17.g, and 17.h, and therefore the full scope of Claim 17.

**VII. Conclusion**

Samsung has not shown a reasonable likelihood that any challenged claim is unpatentable. The Petition ignores limitations in the corrected claims, relies on conventional prior art without teaching the claimed integration or offering a credible motivation to combine, and advances contradictory claim-construction positions in parallel proceedings. Combined with its overlapping challenges and litigation tactics, these deficiencies warrant denial. SnapAid respectfully requests that the Director deny institution of inter partes review for all challenged claims of the '682 Patent.

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Respectfully submitted,

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**APPENDIX A – SNAPAID’S ’682 PATENT CLAIM LISTING**

| <b>Claim [Element]</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1 [1.pre]</b>       | A method for estimating quality of at least one image from a plurality of images, for use with a device that comprises in a single enclosure a digital camera module or functionality that comprises at least one optical lens for focusing received light from a scene and an image sensor coupled to the optical lens for capturing an image of the scene; a motion or location sensor for sensing the device motion; and a processor coupled to at least one image sensor and to the digital camera for receiving data therefrom, the method by the processor comprising use of at least one value and weight; |
| <b>1 [1.a]</b>         | obtaining a first value (QI1) responsive to the device motion from the motion or location sensor;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.b]</b>         | estimating a first weight (c1) associated with the first value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1 [1.c]</b>         | obtaining a second value (QI2) associated with the digital camera;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>1 [1.d]</b>         | estimating a second weight (c2) associated with the second value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.e]</b>         | analyzing the captured image for detecting or recognizing one or more objects in the image and obtaining a third value (QI3) associated with motion of at least one of said objects;                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>1 [1.f]</b>         | estimating a third weight (c3) associated with the third value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1 [1.g]</b>         | obtaining a fourth value (QI4) associated with recognition of object characteristics;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>1 [1.h]</b>         | estimating a fourth weight (c4) associated with the fourth value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.i]</b>         | obtaining a fifth value (QI5) associated with an aesthetic quality of image based on a composition;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>1 [1.j]</b>         | estimating a fifth weight (c5) associated with the fifth value; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>1 [1.k]</b>         | calculating a total quality value according to, or based on values QI1, QI2, QI3 QI4 and QI5 and weights c1, c2, c3, c4 and c5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>2</b>               | The method according to claim 1, wherein the estimating of the first weight (c1) is responsive to at least one of second, third, fourth or fifth value (QI2, QI3, QI4, QI5); or wherein the estimating of the second weight (c2) is responsive to at least one of the first, third, fourth or fifth value (QI1, QI3, QI4, QI5); or wherein the estimating of the third weight (c3) is responsive to at least one of first, second,                                                                                                                                                                                |

| Claim<br>[Element] | Claim Language                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | fourth or fifth value (QI1, QI2, QI4, QI5); or wherein the estimating of the fourth weight (c4) is responsive to at least one of the first, second, third or fifth value (QI1, QI2, QI3, QI5); or wherein the estimating of the fifth weight (c5) is responsive to at least one of the first, second, third or fourth value (QI1, QI2, QI3, QI4).               |
| 3                  | The method according to claim 1, wherein the first weight (c1) is estimated according to, or based on, a precision error, reading resolution, or drift in time, of the motion or location sensor, and wherein the motion or location sensor consists of, or comprises, an accelerometer, a gyroscope, a Global Positioning System (GPS), or a step counter.     |
| 4                  | The method according to claim 1, wherein the third weight (c3) is estimated according to, or based on, the estimated error in the analyzing the captured image for detecting or recognizing objects in the image.                                                                                                                                               |
| 5                  | The method according to claim 1, wherein the digital camera further comprises an auto-focus functionality, wherein the auto-focus functionality is coupled to the controlled by the processor, and wherein the method further comprising controlling the auto-focus functionality according to, or based on, the second value (QI2) or the total quality value. |
| 6                  | The method according to claim 1, wherein object characteristics are at least one of recognized smile, looking at camera, face importance to user or confidence of object recognition.                                                                                                                                                                           |
| 7                  | The method according to claim 1, wherein the aesthetic quality of image based on the composition includes at least one of: rule of thirds, golden triangle, golden spiral, shapes and lines, amputation avoidance, visual balance, diagonal dominance, non-reference quality indication or relative position of salient regions in the image.                   |
| 8                  | The method according to claim 1, further comprising grading the image quality according to, or based on, the total quality value, and wherein the total quality value is calculated as a weighted average value according to, or based on,<br>$c1*QI1+c2*QI2+c3*QI3+c4*QI4+c5*QI5$ .                                                                            |
| 9                  | The method according to claim 1, for use with a probability distribution function using a mean value ( $\mu$ ) and a standard deviation value, wherein the estimating of at least one of the weights (c1, c2,                                                                                                                                                   |

| Claim<br>[Element] | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | c3, c4, c5) is according to, or based on, the respective probability of the at least of the values (QI1, QI2, QI3, QI4, QI5), according to the probability distribution function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10                 | The method according to claim 1, for use with a plurality of former values of the respective QI, further comprising calculating the mean value ( $\mu$ ) and the standard deviation value ( $\sigma$ ) based on the plurality of former values.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 11                 | The method according to claim 1, wherein the acting comprises affecting the digital camera in response to the total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12                 | The method according to claim 1, wherein:<br>the device comprises multiple motion or location sensors for sensing the device motion selected from a group consisting of a gyroscope, accelerometer, Global Positioning System (GPS), 9 Degrees of Freedom(DOF) sensing component, and 10 Degrees of Freedom (DOF) sensing component, wherein the method comprising obtaining a corresponding first value (QI1i) from each of the multiple motion or location sensors responsive to the device motion from the respective motion or location sensor; and estimating or calculating the first value (QI1) based on the multiple first values (QI1i) from the multiple motion or location sensors, or wherein:<br>the analyzing of the captured image comprises applying multiple algorithms selected from a group consisting of an aesthetic algorithm, an artificial neural network employing deep learning algorithm, a corner detection algorithm, a blur detecting algorithm, and Peak Signal-to-Noise Ratio (PSNR) calculation, and the method further comprising obtaining a respective third value (QI3i) associated with each of multiple algorithms, and calculating or estimating the third value (QI3) based on the multiple third values (QI3i) from the multiple algorithms. |
| 13                 | The method according to claim 1, wherein estimating fourth value (QI4) or forth weight (c4) is based at least partly on a list of configured faces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 14                 | The method according to claim 1, wherein algorithms of deep learning are used to compute at least one of the values (QI1, QI2, QI3, QI4, QI5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 15                 | The method according to claim 1, wherein algorithms of deep learning are used to compute the total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| <b>Claim [Element]</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>16</b>              | The method according to claim 1, wherein the second value is a combination of at least one of digital camera exposure, focus and under or over exposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>17 [17.pre]</b>     | A method for estimating quality of at least one image from a stream of images from a video, for use with a device that comprises in a single enclosure a digital camera module or functionality that comprises at least one optical lens for focusing received light from a scene and an image sensor coupled to at least one optical lens for capturing an image of the scene; a motion or location sensor for sensing the device motion; and a processor coupled to the image sensor and to the digital camera for receiving data therefrom, the method by the processor comprising use of at least one value and weight; |
| <b>17 [17.a]</b>       | obtaining a first value (QI1) responsive to the device motion from the motion or location sensor;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>17 [17.b]</b>       | estimating a first weight (c1) associated with the first value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>17 [17.c]</b>       | obtaining a second value (QI2) value is a combination of at least one of digital camera exposure, focus and under or over exposure;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>17 [17.d]</b>       | estimating a second weight (c2) associated with the second value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>17 [17.e]</b>       | analyzing the captured image via deep learning algorithms for detecting or recognizing one or more objects in, or one or more characteristics of image or at least one of object characteristics to obtain a third value (QI3) associated with the analysis;                                                                                                                                                                                                                                                                                                                                                                |
| <b>17 [17.f]</b>       | estimating a third weight (c3) associated with the third value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>17 [17.g]</b>       | calculating a total quality value according to, or based on values QI1, QI2, QI3 and weights c1, c2, c3 and previous values QI1, QI2, QI3 and previous weights c1, c2, c3 in said image stream; and                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>17 [17.h]</b>       | selecting by said processor at least one image from the plurality of images at least partly on said total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>18</b>              | The method according to claim 17, where a first value (QI1) can be a combination of accelerometer data, gyro data and camera/lens module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>19</b>              | The method according to claim 17, wherein algorithms of deep learning are used to compute at least one of the values (QI1, QI2, QI3).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>20</b>              | The method according to claim 17, wherein algorithms of deep learning are used to compute the total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**APPENDIX B – ERRORS IN SAMSUNG'S CLAIM LISTING**

Elements incorrec~~ted~~ presented in Samsung's Claim Listing are marked using underlines, strikethrough, and highlighting below.

See Ex. 1016 at 361.

| <b>Claim<br/>[Element]</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1 [1.pre]</b>           | A method for estimating quality of at least one image from a plurality of images, for use with a device that comprises in a single enclosure a digital camera module or functionality that comprises at least one optical lens for focusing received light from a scene and an image sensor coupled to the optical lens for capturing an image of the scene; a motion or location sensor for sensing the device motion; and a processor coupled to at least one image sensor and to the digital camera for receiving data therefrom, the method by the processor comprising use of at least one value and weight; |
| <b>1 [1.a]</b>             | obtaining a first value (QI1) responsive to the device motion from the motion or location sensor;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.b]</b>             | estimating a first weight (c1) associated with the first value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1 [1.c]</b>             | obtaining a second value (QI2) associated with the digital camera;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>1 [1.d]</b>             | estimating a second weight (c2) associated with the second value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.e]</b>             | analyzing the captured image for detecting or recognizing one or more objects in the image and obtaining a third value (QI3) associated with motion of at least one of said objects;                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>1 [1.f]</b>             | estimating a third weight (c3) associated with the third value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1 [1.g]</b>             | obtaining a fourth value (QI4) associated with recognition of object characteristics;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>1 [1.h]</b>             | estimating a fourth weight (c4) associated with the fourth value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.i]</b>             | obtaining a fifth value (QI5) associated with <u>an</u> aesthetic quality of image based on <u>a</u> composition;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>1 [1.j]</b>             | estimating a fifth weight (c5) associated with the fifth value; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>1 [1.k]</b>             | calculating a total quality value according to, or based on values QI1, QI2, QI3 <u>QI4</u> and QI5 and weights c1, c2, c3, c4 and c5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Claim<br>[Element] | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2                  | The method according to claim 1, wherein the estimating of the first weight (c1) is responsive to at least one of second, third, fourth or fifth value (QI2, QI3, QI4, QI5); or wherein the estimating of the second weight (c2) is responsive to at least one of the first, third, fourth or fifth value (QI1, QI3, QI4, QI5); or wherein the estimating of the third weight (c3) is responsive to at least one of first, second, fourth or fifth value (QI1, QI2, QI4, QI5); or wherein the estimating of the fourth weight (c4) is responsive to at least one of the first, second, third or fifth value (QI1, QI2, QI3, QI5); or wherein the estimating of the fifth weight (c5) is responsive to at least one of the first, second, third or fourth value (QI1, QI2, QI3, QI4). |
| 3                  | The method according to claim 1, wherein the first weight (c1) is estimated according to, or based on, a precision error, reading resolution, or drift in time, of the motion or location sensor, and wherein the motion or location sensor consists of, or comprises, an accelerometer, a gyroscope, a Global Positioning System (GPS), or a step counter.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4                  | The method according to claim 1, wherein the third weight (c3) is estimated according to, or based on, the estimated error in the analyzing the captured image for detecting or recognizing objects in the image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5                  | The method according to claim 1, wherein the digital camera further comprises an auto-focus functionality, wherein the auto-focus functionality is coupled to the controlled by the processor, and wherein the method further comprising controlling the auto-focus functionality according to, or based on, the second value (QI2) or the total <b>quality</b> value.                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6                  | The method according to claim 1, wherein object characteristics are at least one of recognized smile, looking at camera, face importance to user or confidence of object recognition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7                  | The method according to claim 1, wherein <b>the</b> aesthetic quality of image based on <b>the</b> composition includes at least one of: rule of thirds, golden triangle, golden spiral, shapes and lines, amputation avoidance, visual balance, diagonal dominance, non-reference quality indication or relative position of salient regions in the image.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8                  | The method according to claim 1, further comprising grading the image quality according to, or based on, the total <b>quality</b> value, and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Claim<br>[Element] | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | wherein the total <b>quality</b> value is calculated as a weighted average value according to, or based on,<br>$c1*QI1+c2*QI2+c3*QI3+c4*QI4+c5*QI5$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9                  | The method according to claim 1, for use with a probability distribution function using a mean value ( <b><math>\mu</math></b> ) and a standard deviation value ( <b><math>\sigma</math></b> ), wherein the estimating of at least one of the weights (c1, c2, c3, c4, c5) is according to, or based on, the respective probability of the at least of the values (QI1, QI2, QI3, QI4, QI5), according to the probability distribution function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10                 | The method according to claim 1, for use with a plurality of former values of the respective QI, further comprising calculating the mean value ( $\mu$ ) and <b>the as</b> the standard deviation value ( $\sigma$ ) based on the plurality of former values.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 11                 | The method according to claim 1, wherein the acting comprises affecting the digital camera in response to the total <b>quality</b> value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 12                 | The method according to claim 1, wherein:<br>the device comprises multiple motion or location sensors for sensing the device motion selected from a group consisting of a gyroscope, accelerometer, Global Positioning System (GPS), 9 Degrees of Freedom(DOF) sensing component, and 10 Degrees of Freedom (DOF) sensing component, wherein the method comprising obtaining a corresponding first value (QI1i) from each of the multiple motion or location sensors responsive to the device motion from the respective motion or location sensor; and estimating or calculating the first value (QI1) based on the multiple first values (QI1i) from the multiple motion or location sensors, or wherein:<br>the analyzing of the captured image comprises applying multiple algorithms selected from a group consisting of an aesthetic algorithm, an artificial neural network employing deep learning algorithm, a corner detection algorithm, a blur detecting algorithm, and Peak Signal-to-Noise Ratio (PSNR) calculation, and the method further comprising obtaining a respective third value (QI3i) associated with each of multiple algorithms, and calculating or estimating the third value (QI3) based on the multiple third values (QI3i) from the multiple algorithms. |

| Claim<br>[Element] | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13                 | The method according to claim 1, wherein estimating fourth value (QI4) or forth weight (c4) is based at least partly on a list of configured faces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 14                 | The method according to claim 1, wherein algorithms of deep learning are used to compute at least one of the values (QI1, QI2, QI3, QI4, QI5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 15                 | The method according to claim 1, wherein algorithms of deep learning are used to compute the total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 16                 | The method according to claim 1, wherein the second value is a combination of at least one of digital camera exposure, focus and under or over exposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 17 [17.pre]        | A method for estimating quality of at least one image from a stream of images from a video, for use with a device that comprises in a single enclosure a digital camera module or functionality that comprises at least one optical lens for focusing received light from a scene and an image sensor coupled to at least one optical lens for capturing an image of the scene; a motion or location sensor for sensing the device motion; and a processor coupled to the image sensor and to the digital camera for receiving data therefrom, the method by the processor comprising use of at least one value and weight; |
| 17 [17.a]          | obtaining a first value (QI1) responsive to the device motion from the motion or location sensor;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17 [17.b]          | estimating a first weight (c1) associated with the first value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 17 [17.c]          | obtaining a second value (QI2) value is a combination of at least one of digital camera exposure, focus and under or over exposure;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 17 [17.d]          | estimating a second weight (c2) associated with the second value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17 [17.e]          | analyzing the captured image via deep learning algorithms for detecting or recognizing one or more objects in, or one or more characteristics of image or at least one of object characteristics to obtain a third value (QI3) associated with the analysis;                                                                                                                                                                                                                                                                                                                                                                |
| 17 [17.f]          | estimating a third weight (c3) associated with the third value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 17 [17.g]          | calculating a total quality value according to, or based on values QI1, QI2, QI3 and weights c1, c2, c3 and previous values QI1, QI2, QI3 and previous weights c1, c2, c3 in said image stream; and                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 17 [17.h]          | selecting by said processor at least one image from the plurality of images at least partly on said total quality value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| <b>Claim<br/>[Element]</b> | <b>Claim Language</b>                                                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>18</b>                  | The method according to claim 17, where a first value (QI1) can be a combination of accelerometer data, gyro data and camera/lens module.       |
| <b>19</b>                  | The method according to claim 17, wherein algorithms of deep learning are used to compute at least one of the values (QI1, QI2, QI3, QI4, QI5). |
| <b>20</b>                  | The method according to claim 17, wherein algorithms of deep learning are used to compute the total quality value.                              |

**CERTIFICATION OF WORD COUNT**

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Preliminary Response is produced using a 14 point Times New Roman font and contains 12,357 words excluding any table of contents, mandatory notices under 37 C.F.R. § 42.8, certificates of service or compliance, or appendix of exhibits, according to the word-processing program used to prepare this document (Microsoft Word).

Dated: December 15, 2025

/s/ James Nuttall  
James Nuttall (Reg. No. 44,978)

Counsel for Patent Owner,  
SNAPAID LTD.

**CERTIFICATE OF SERVICE**

The undersigned certifies that on the fifteenth day of December, 2025, a complete and entire copy of the foregoing Patent Owner's Preliminary Response, including exhibits, if any, was served on the date below on the following counsel of record via email per Petitioner's consent to electronic service.

Dated: December 15, 2025

/s/ James Nuttall  
James Nuttall (Reg. No. 44,978)

Counsel for Patent Owner,  
SNAPAID, LTD.