

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner,

v.

PERCEPTIVE AUTOMATA LLC,

Patent Owner.

Case No. IPR2025-01576

Patent No. 11,467,579

CORRECTED PATENT OWNER'S RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Exhibit #	Description
2001	Tesla February 1, 2022 IDS
2002	Tesla March 1, 2022 IDS
2003	Tesla March 4, 2022 IDS
2004	Tesla March 17, 2022 IDS
2005	Tesla March 18, 2022 IDS
2006	Tesla March 18, 2022 IDS
2007	Tesla March 21, 2022 IDS
2008	Tesla March 22, 2022 IDS
2009	Tesla March 22, 2022 IDS
2010	Tesla May 4, 2022 IDS
2011	Tesla May 10, 2022 IDS
2012	Tesla May 11, 2022 IDS
2013	Tesla May 11, 2022 IDS
2014	Tesla May 11, 2022 IDS
2015	Tesla May 12, 2022 IDS
2016	Tesla May 12, 2022 IDS
2017	Tesla May 13, 2022 IDS
2018	Tesla May 13, 2022 IDS
2019	Tesla May 25, 2022 IDS
2020	Tesla June 28, 2022 IDS
2021	Perceptive's Original Complaint
2022	Tesla's Motion to Dismiss
2023	Perceptive's First Amended Complaint
2024	Tesla's Motion to Stay
2025	Perceptive's Opposition to Tesla's Motion to Stay
2026	Tesla's Reply in Support of Motion to Stay
2027	Perceptive's Sur-Reply in Opposition to Motion to Stay
2028	Docket Sheet
2029	Motion for Protective Order
2030	Protective Order
2031	Operative Docket Control Order

2032	Perceptive's Document Request Letter
2033	Perceptive's First Set of Interrogatories
2034	Tesla's First Set of Interrogatories
2035	Tesla's Notice of Broadened Sotera Plus Stipulation
2036	Tesla's Initial and Additional Disclosures
2037	District Court Statistics on Post-Institution Motions to Stay Pending IPR
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2056	M. Wang, W. Deng, Deep Face Recognition: A Survey, <i>Neurocomputing</i> (2020)
2057	Kooij JFP, Schneider N, Flohr F, Gavril DM (2014) Context-based pedestrian path prediction. In: Proceedings of the European Conference on Computer Vision (ECCV). Berlin: Springer, pp. 618–633
2058	A. Zyner, S. Worrall, J. Ward and E. Nebot, “Long short term memory for driver intent prediction,” 2017 IEEE Intelligent Vehicles Symposium (IV), Los Angeles, CA, USA, 2017, pp. 1484-1489
2059	C. Aggarwal, “Neural Networks and Deep Learning”, Springer ISBN 978-3-319-94462-3

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.120, Patent Owner Perceptive Automata LLC (“Perceptive”) submits this Patent Owner’s Response to the Petition for *Inter Partes* Review (“Petition”) filed by Tesla, Inc. (“Petitioner”) and challenging claims 1-20 of U.S. Patent No. 11,467,579 (the “’579 patent”) (Ex. 1001). The Board should find the challenged claims of the ’579 patent not unpatentable because Petitioner has not met its burden on any of its proposed grounds of unpatentability, which are each based on obviousness under 35 U.S.C. § 103(a).

The Petition suffers from three fundamental flaws, each of which independently defeats the Petition.

First, Petitioner’s prior art references do not disclose every limitation of the challenged claims and therefore fail to render those claims obvious. Ground 1 of the Petition alleges that the challenged claims are obvious in view of U.S. Patent Application Publication No. 2019/0049970 (“Djuric”) (Ex. 1004) and U.S. Patent Application Publication No. 2020/0160535 (“AA”) (Ex. 1005). Ground 2 adds International Publication No. WO2014/210334 (“Cox”) (Ex. 1008) to the combination of Djuric and AA. Grounds 3 and 5 add one of two additional references

to the combination of Djuric and AA,¹ and Grounds 4 and 6 likewise add one of those two same references to the combination of Djuric, AA, and Cox. Critically, each of the eight grounds relies exclusively on Djuric for certain claim limitations, and Djuric does not teach those limitations.

Second, Petitioner relies on a combination of references for each asserted ground but fails to provide a valid reason why a POSITA would have been motivated to combine them. Nor could it, because the references themselves teach away from the proposed combinations. Further, Petitioner expressly relies on the '579 patent as a blueprint for its analysis, thereby introducing impermissible hindsight bias.

Third, Petitioner fails to address the *Graham* factors, despite their being a required component of any obviousness analysis. This omission independently precludes a finding of obviousness as to any challenged claim.

Given these flaws in the Petition's Grounds, the Board should find the challenged claims not unpatentable.

¹ U.S. Patent Application Publication No. 2018/0247200 ("Rolfe") (Ex. 1009) or U.S. Patent No. 10,496,091 ("Ross") (Ex. 1015).

II. THE '579 PATENT AND THE CHALLENGED CLAIMS

A. Overview of the '579 Patent

The invention disclosed and claimed in the '579 patent generally relates to systems and methods for “navigating an autonomous vehicle through traffic and more specifically to probabilistic neural networks for predicting hidden context of traffic entities for autonomous vehicles.” *See, e.g.*, Ex. 1001 at 1:20-23. The invention claimed in the '579 patent is directed to training a probabilistic neural network. *Id.* at 2:41-49. A probabilistic neural network (PNN) is generally “a multi-task neural network,” and in the context of the '579 patent, it is “configured to predict a plurality of output values representing different hidden context attributes” (*id.* at 6:4-6) that “may generate different outputs for the same input if the neural network is executed repeatedly [and] the outputs generated have a particular statistical distribution, for example, mean and standard deviation” (*id.* at 7:22-24).

As described in the '579 patent claims and specification, the claimed PNN is capable of performing several operations including “receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic” and “generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image.” *Id.*, claim 1. Hidden context in an image can be, for example, “a state of mind of a user,” “a task that a user . . . is

planning on accomplishing,” “a goal of a user . . . wherein the user expects to achieve the goal within a threshold time interval,” “a near term goal . . . for example . . . indicating that the person is likely to pick up an object (e.g., a wallet) dropped on the street but stay on that side of the street,” “a degree of awareness of the autonomous vehicle by a user” (*id.* at 2:64-3:15), “awareness of a bicyclist that a vehicle is driving close to the bicyclist,” or the “intent of a pedestrian” (*id.* at 5:42-46).

Further, the system of the ’579 patent:

Requests user responses from users observing images of traffic entities, wherein each user response is one of a plurality of values. Each value from the plurality of values corresponds to a rating that the user provides to a hidden context of the traffic entity. For example, the user response may be a value between 1 to 5 (e.g., each user response is one value selected from the values 1, 2, 3, 4, and 5). The user response indicates, what the user believes is the value of the hidden context attribute, for example, on a scale from 1-5, a number indicating how likely the user believes, a pedestrian is likely to cross the street or how likely a bicyclist is aware of a vehicle.

Id. at 7:4-15.

B. Claim Overview

Independent claims 1, 13, and 20 are reproduced below:

Claim 1	Limitations
1[pre]	A method for navigating autonomous vehicles, comprising:
1[a]	training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:
1[a-i]	receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic,
1[a-ii]	generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and
1[a-iii]	generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;
1[b]	receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;
1[c]	executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;
1[d]	determining a measure of uncertainty for each of the plurality of values; and
1[e]	navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network.

Claim 13	Limitations
13[pre]	A non-transitory computer readable storage medium storing instructions, that when executed by a processor, cause the processor to perform steps comprising:
13[a]	training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:
13[a-i]	[the probabilistic neural network configured to perform steps comprising:] receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic,
13[a-ii]	[the probabilistic neural network configured to perform steps comprising:] generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and
13[a-iii]	[the probabilistic neural network configured to perform steps comprising:] generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;
13[b]	receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;
13[c]	executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;
13[d]	determining a measure of uncertainty for each of the plurality of values; and
13[e]	navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network.

Claim 20	Limitations
20[pre]	A computer system comprising: a processor; and a non-transitory computer readable storage medium storing instructions that when executed by the processor, cause the processor to perform steps comprising:
20[a]	training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:
20[a-i]	[the probabilistic neural network configured to perform steps comprising:] receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic,
20[a-ii]	[the probabilistic neural network configured to perform steps comprising:] generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and
20[a-iii]	[the probabilistic neural network configured to perform steps comprising:] generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;
20[b]	receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;
20[c]	executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;
20[d]	determining a measure of uncertainty for each of the plurality of values; and
20[e]	navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network.

III. LEVEL OF ORDINARY SKILL

Tesla alleges that a POSITA in the field of the '579 patent as of July 5, 2017 “would have had at least: (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, or equivalent course work, with two to three years of work experience in computer vision, image/video processing, and/or machine learning; or (2) a master’s degree in electrical engineering, computer engineering, computer science, or equivalent course work, with a focus in computer vision, autonomous vehicles, and/or machine learning.” Pet. 15-16; *see also* Ex. 1003, ¶ 66. Neither Perceptive nor its expert (Dr. Saber) dispute this definition for purposes of resolving this IPR proceeding. Ex. 2048, ¶ 53.

Notably, Tesla does not allege that its expert (Dr. Janét) meets this definition, nor does Dr. Janét opine that he does. *See* Pet.; Ex. 1003. As such, Tesla has not established that Dr. Janét was a POSITA at the relevant time for purposes of this proceeding and thus his opinions should not be given consideration. *See, e.g., Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1377-78 (Fed. Cir. 2022) (finding abuse of discretion when ALJ admitted “testimony on any issue that is analyzed through the lens of” a POSITA when expert did not qualify as POSITA). In contrast, Dr. Saber not only meets this definition today, but he also met it in the February 2019 timeframe. Ex. 2048, ¶ 53.

IV. APPLICABLE LEGAL STANDARDS

A. Tesla's Burden

As the petitioner, Tesla bears the burden of showing the unpatentability of the challenged claims by a preponderance of the evidence. *See* 35 U.S.C. § 316(e). This burden never shifts to Perceptive. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (“[T]he Petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”); *Amazon Web Services, Inc. v. Saint Regis Mohawk Tribe*, IPR2019-00103, Paper 22 at 17 (PTAB May 10, 2019) (“The burden is on Petitioner, not the Board, to specify with particularity how [the prior art] teaches [various claimed features].”); *Liberty Mut. Ins. Co. v. Progressive Cas. Ins. Co.*, No. CBM2012-00003, Paper 8 at 14-15 (P.T.A.B. Oct. 25, 2012) (representative) (“[I]t is the responsibility of the Petitioner to clearly articulate [the proposed combination].”); 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(4). The Petition must provide an understandable explanation of the element-by-element specifics of the patentability challenges. *See* 35 U.S.C. § 312(a)(3); 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(3)-(4).

B. Obviousness in IPR Proceedings

Each of Tesla's grounds relies on obviousness. Section 103 of the Patent Act provides that “[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter

as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). If a single element of the claim is absent from the prior art, the claim cannot be considered obvious. *See CFMT, Inc. v. YieldUp Int’l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (“[O]bviousness requires a suggestion of all limitations in a claim.”) (citing *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974)); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversing obviousness rejection where prior art did not teach all claim limitations)).

Further, “[b]ecause an *inter partes* review may only be requested ‘on the basis of prior art consisting of patents or printed publications,’ . . . expert testimony cannot take the place of disclosure from patents or printed publications.” *See* OFFICE PATENT TRIAL PRACTICE GUIDE at § I.G. “In other words, expert testimony may explain ‘patents and printed publications,’ but is not a substitute for disclosure in a prior art reference itself.” *Id.*; *see In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006) (“[R]jections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

C. The *Graham* Factors in IPR Proceedings

Obviousness is resolved on several factual determinations including: (1) the scope and content of the prior art, (2) any differences between the claimed subject

matter and the prior art, and (3) the level of ordinary skill in the art. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). These factors provide the threshold “background” for the obviousness determination, and without undertaking an analysis of the *Graham* factors, a proper obviousness determination cannot be made. *Id.* at 18 (“Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. *Against this background, the obviousness or nonobviousness of the subject matter is determined.*”) (emphasis added).

In view of this clear Supreme Court precedent, it is not surprising that IPR petitions “must address the *Graham* factors.” *Eizo Corp. v. Barco N.V.*, No. IPR2014-00358, Paper 11 at 29-30 (P.T.A.B. July 23, 2014) (citing *Graham*, 383 U.S. at 17-18). For example, the Board faulted the petitioner in *Eizo* for failing to identify the differences between the claimed subject matter and the prior art. *Id.* at 29-30. In particular, the Board found insufficient the petitioner’s “conclusory assertion” that “[t]o the extent [the first reference] may not explicitly teach” the limitation, the second reference “explicitly teaches this limitation.” *Id.* at 30. The Board explained that “such an assertion fails to resolve the exact differences sought to be derived from” the second reference. *Id.* (finding that petitioner had not shown

a reasonable likelihood of prevailing on that ground). Other Board decisions have reached the same result. *See, e.g., Moses Lake Indus., Inc. v. Enthone, Inc.*, No. IPR2014-00246, Paper 6 at 17 (P.T.A.B. June 18, 2014); *eBay, Inc. v. Paid, Inc.*, No. CBM2014-00125, Paper 15 at 21 (P.T.A.B. Sept. 30, 2014).

V. CLAIM CONSTRUCTION

Patent Owner submits that the Board need not construe any claim terms in a particular manner to arrive at the conclusion that the Petition is deficient. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (claims “need only be construed ‘to the extent necessary to resolve the controversy’”).

Patent Owner believes that the term “hidden context” should be treated according to its plain and ordinary meaning. Nonetheless, Patent Owner notes that, as the ’579 patent explains, the plain and ordinary meaning of hidden context “represent[s] intentions and future plans of a traffic entity” (Ex. 1001 at 14:53-55) and “includes factors that affect the behavior of[] traffic entities, for example, a state of mind of a pedestrian, a degree of awareness of the existence of the autonomous vehicle in the vicinity (for example, whether a bicyclist is aware of the existence of the autonomous vehicle in the proximity of the bicyclist), and so on” (*id.* at 4:12-18).

VI. GROUNDS 1, 3, 5: THE CITED REFERENCES (DJURIC AND AA) DO NOT RENDER THE CHALLENGED CLAIMS UNPATENTABLE

The challenged claims are not unpatentable in view of Grounds 1, 3, or 5. Ground 1 of the Petition alleges that the challenged claims are obvious in view of Djuric and AA, whereas Grounds 3 and 5 allege obviousness over Djuric and AA in view of Rolfe or Ross. *See* Pet. at 11. However, as discussed below, Djuric fails to teach several limitations of the challenged claims, and those defects are not cured by the addition of AA, or by the further addition of Rolfe or Ross.²

A. Djuric

Djuric is “directed to predicting the moving trajectory of objects that are within the surrounding environment of an autonomous vehicle” using “state data [fused] with data associated with a geographic area.” Ex. 1004 at ¶ 0021. In general,

² Unless otherwise noted, Patent Owner’s arguments in this section refer to Petitioner’s allegations concerning Ground 1. However, Patent Owner’s arguments herein apply equally to Grounds 3 and 5. For Grounds 3 and 5, Petitioner does not rely on Rolfe or Ross as allegedly teaching any of the elements that, as discussed herein, Djuric and AA do not teach. *See* Pet. at 65, 70-74. Instead, those grounds merely rely on Rolfe or Ross as allegedly teaching elements of dependent claims. *See id.*

Djuric predicts a future location of an object based on the object's velocity and acceleration, known current and/or past locations of the object, and elements in the object's environment such as obstructions in the path of the object. *See id.* at ¶¶ 0023, 0025; Ex. 2048 at ¶ 62. Djuric's "output is indicative of a plurality of predicted trajectories of the object." Ex. 1004 at ¶ 0005, claim 1.

Djuric's trajectory predictions are based on observable motion characteristics of an object, including its heading, velocity, acceleration, and interaction with physical features of the environment. For example, a calculation of trajectory relies on the heading and velocity of a moving object. *See id.* at ¶ 0033. Djuric recognizes that obstacles in an object's path may affect or constrain the object's predicted trajectory. *See id.* Thus, Djuric is directed to predicting where an observed object will move based on the object's state and surroundings.

As the '579 patent explains, this type of kinematics-based prediction was known in the prior art:

Conventional systems predict motion of non-stationary objects using kinematics. For example, autonomous vehicles may rely on methods that make decisions on how to control the vehicles by predicting motion vectors of objects near the vehicles. **This is accomplished by collecting data of an objects current and past movements,** determining a motion vector of the object at a current time based on these movements, **and extrapolating a future motion vector**

representing the object's predicted motion at a future time based on the current motion vector. However, these techniques fail to predict motion of certain non-stationary objects for example, pedestrians, bicyclists, and so on. For example, if the autonomous vehicle detects a pedestrian standing in a street corner, the motion of the pedestrian does not help predict whether the pedestrian will cross the street or whether the pedestrian will remain standing on a street corner. Similarly, if the autonomous vehicle detects a bicyclist in a lane, the current motion of the bicycle does not help the autonomous vehicle predict whether the bicycle will change lanes.

Ex. 1001 at 1:38-56 (emphases added).

Consistent with this conventional approach, Djuric relies on “state data” that is “associated with an object that is within a surrounding environment of the autonomous vehicle.” Ex. 1004 at ¶ 0007. Djuric explains that “state data that describes current and/or past states of an object within the surrounding environment of the vehicle can [be fused] with data associated with a geographic area in which the object is located (e.g., map data, satellite imagery, etc.) to create a combined data set.” *Id.* at ¶ 0021. The purpose of this fusion is to “project the data associated with the geographic area onto the state data such that the states of the object can be better evaluated within the context of the object's surroundings.” *Id.* In other words, the geographic information provides data points for evaluating the object's motion and predicting the object's future location. *See* Ex. 2048 at ¶ 61.

Indeed, Djuric expressly states that its approach “enables the autonomy computing system to focus its processing resources . . . on predicting the future location(s) of an individual object, rather than the future states of the entire surrounding environment.” *Id.* at ¶ 0031. Thus, even when Djuric uses geographic information, that information serves only to improve prediction of an observed object’s trajectory. *See* Ex. 2048 at ¶ 61. Djuric does not disclose analyzing image content to infer hidden context, identifying latent information within an image, or predicting information unrelated to the observed state and motion of a particular object. *See id.* at ¶ 62. Accordingly, Djuric does not disclose, and is not directed to, the claimed hidden-context prediction techniques of the ’579 patent.

B. AA

AA is “directed to a method for predicting subject motion” based on “training data comprising a set of subject pose trees . . . wherein each subject pose tree . . . indicates a location along the axis of the image at which each of a plurality of joints of a subject is located” in order “to generate a probability distribution . . . indicating a likelihood that the joint will be located at each location along the axis.” Ex. 1005 at ¶ 0005, claim 1. In general, AA uses a convolutional neural network to predict motion of a subject based on the subject’s body poses. *See id.* at ¶¶ 0001-0005; *see* Ex. 2048 at ¶ 65.

AA explains that its convolutional neural network is “designed to recognize visual features from an image.” *Id.* at ¶ 0034. The convolutional neural network recognizes features hierarchically, with lower layers detecting basic image characteristics such as edges, intermediate layers recognizing combinations of features such as shapes, and higher layers identifying objects and body structures. *See id.* at ¶ 0029. These extracted image features are used to identify and track the locations of a subject’s joints and body poses. *See, e.g., id.* at ¶ 0062; *see also* Ex. 2048 at ¶ 65.

AA’s objective is not to infer hidden or latent contextual information from an image. Rather, AA uses image-derived features to estimate observable body positions and predict how those positions are likely to change over time. To accomplish such a feature analysis, the system of AA must perform complex and involved image segmentation and registration processes. *See, e.g., id.* at ¶¶ 0035-0038, FIG. 2D; *see also* Ex. 2048 at ¶ 92. The training data itself consists of pose trees identifying the locations of joints within an image, and the output is a probability distribution predicting the location of each joint. *See id.* ¶ 0005, claim 1. Thus, both the inputs to and outputs of AA concern a subject’s physical pose and motion. *See* Ex. 2048 at ¶ 66.

Although AA employs a convolutional neural network to process image data, the network is trained to identify visual features associated with a subject's body and to predict future movement of that subject. AA does not disclose inferring hidden context from an image, predicting information that is not tied to the observed pose of a subject, or generating representations of latent contextual information underlying image content. *See id.* at ¶ 66. Instead, AA is directed to pose estimation and motion prediction based on observable visual characteristics. Accordingly, AA does not disclose, and is not directed to, the claimed hidden-context prediction techniques of the '579 patent.

C. Djuric Does Not Teach “generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image” (Limitations 1[a-iii], 13[a-iii], and 20[a-iii])

1. Djuric Does Not Teach “hidden context”

Petitioner does not contend that AA teaches the claimed “hidden context.” Rather, Petitioner relies exclusively on Djuric for this limitation. *See Pet.* at 29-31, 53, 55. That reliance is misplaced because neither Djuric nor AA teaches hidden context, nor do they teach generating an output representing hidden context as required by the challenged claims.

The '579 patent explains that “hidden context” encompasses information that is not directly observable from an image (*see Ex. 2048 at* ¶ 69), such as “a state of

mind of a user,” “a task that a user . . . is planning on accomplishing,” “a goal of a user . . . wherein the user expects to achieve the goal within a threshold time interval,” “a near term goal . . . for example . . . indicating that the person is likely to pick up an object (e.g., a wallet) dropped on the street but stay on that side of the street,” “a degree of awareness of the autonomous vehicle by a user” (Ex. 1001 at 2:64-3:15), “awareness of a bicyclist that a vehicle is driving close to the bicyclist,” or the “intent of a pedestrian” (*id.* at 5:42-46). Djuric does not teach these concepts or any analogous hidden contextual information. *See* Ex. 2048 at ¶ 70. Nor does either reference disclose *generating output representing* such hidden context. *See id.* at ¶ 76.

With respect to the “hidden context” limitation, Petitioner argues that Djuric’s teaching that “the model generates predicted trajectories in consideration of ‘the nominal pathway(s) of an object’” meets the claimed “generating output representing hidden context” and that “Djuric’s disclosure of ‘goal-based prediction’ aligns with the ’579 patent’s description of ‘hidden context.’” Pet. at 29-30; Ex. 1003 at ¶ 93. Neither of these arguments has merit. Not only does Djuric’s “predicted trajectories in consideration of ‘the nominal pathway(s) of an object’” not meet this claim element, but Petitioner’s alleged “alignment” is incorrect in light of the ’579 patent’s specification.

Djuric’s “goal-based prediction” is fundamentally different from the hidden context disclosed and claimed in the ’579 patent. *See* Ex. 2048 at ¶ 72. As Petitioner notes, Djuric’s “nominal pathways correspond to ‘common patterns of object travel.’” Pet. at 29-30; Ex. 1003 at ¶ 93. Djuric explains that the “‘goal’ that an object may aim to accomplish . . . [is] associated with one or more nominal pathways . . . correspond[ing] to common patterns of object travel [such as] vehicles travelling within lanes on a roadway or other travel way, bicycles traveling in a bike lane, pedestrians travelling within the boundaries of a walkway, etc.” Ex. 1004 at ¶ 0081. Thus, Djuric’s notion of a “goal” is simply for the object to travel along a pathway in a commonly recognized pattern. *See id.*; Ex. 2048 at ¶ 71.

The ’579 patent, by contrast, focuses on the nature of people to behave in ways that are typically unpredictable by conventional systems—in contrast to the movement in “common patterns” that was recognized by prior art systems. *See id.* at ¶ 72. Indeed, the ’579 patent emphasizes that “[t]he system uses the hidden context to predict behavior of people near a vehicle in a way that more closely resembles how human drivers would judge the behavior.” *See, e.g.*, Ex. 1001 at 4:19-22. Djuric’s prediction of movement along common pathways is therefore fundamentally different from the claimed prediction of hidden context. *See* Ex. 2048 at ¶ 72.

This distinction is further reflected in Djuric’s inputs and outputs. Djuric relies on “state data” that is specifically “*associated with an object* that is within a surrounding environment of the autonomous vehicle.” Ex. 1004 at ¶ 0007 (emphasis added). Although Djuric permits this state data to be fused with geographic information, the purpose of that fusion is merely to “project the data associated with the geographic area onto the state data such that the states of the object can be better evaluated within the context of the object’s surroundings.” *Id.* at ¶ 0021. Djuric repeatedly emphasizes that environmental information is used only to improve prediction of an individual object’s future motion. *See* Ex. 2048 at ¶¶ 61, 73. Indeed, Djuric explains that its approach “enables the autonomy computing system to *focus its processing resources* (e.g., when running the machine-learned model) *on predicting the future location(s) of an individual object, rather than the future states of the entire surrounding environment.*” Ex. 1004 at ¶ 0031 (emphases added). Thus, Djuric’s approach teaches away from analyzing an entire environment surrounding an object. *See id.*; Ex. 2048 at ¶ 73.

Djuric is focused on predicting the future location of an individual object based on the object’s observed state and surroundings. *See id.* It does not analyze an image to infer hidden contextual information, such as whether a bicyclist is aware of a nearby vehicle, whether a pedestrian intends to cross a street, or whether a

person is pursuing a particular objective. *See* Ex. 1001 at 3:10-14 (discussing hidden context “represent[ing] a degree of awareness of the autonomous vehicle by a user represented by the traffic entity, for example, whether a bicyclist driving in front of the autonomous vehicle is likely to be aware that the autonomous vehicle is behind the bicycle.”).

Tesla’s expert declaration adds nothing here, as its expert merely regurgitates the Petition’s allegations. *Compare* Pet. 29-31 *with* Ex. 1003, ¶¶ 92-96. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12 at 5 (P.T.A.B. Feb. 10, 2023) (affirming Board’s decision to “giv[e] little weight to Petitioner’s expert because the expert declaration merely offered conclusory assertions without underlying factual support and repeated, *verbatim*, Petitioner’s conclusory arguments”); *In re Ethicon, Inc.*, 844 F.3d 1344, 1348, 1352 (Fed. Cir. 2017) (concluding that the Board properly gave “little weight” to conclusory expert testimony of objective indicia); *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019) (“This court’s opinions have repeatedly recognized that conclusory expert testimony is inadequate to support an obviousness determination on substantial evidence review”).

Because Djuric does not teach hidden context or generating an output representing hidden context, and because Petitioner does not rely on AA for this

teaching, the combination of Djuric and AA does not teach this element of the challenged claims.

2. Djuric Does Not Teach “the output comprising a plurality of values”

As in Section VI.C.1 above, Petitioner does not contend that AA discloses the claimed “the output comprising a plurality of values.” Rather, Petitioner relies exclusively on Djuric for this limitation. *See* Pet. at 29-31, 53, 55. Nothing in Djuric teaches this limitation. Petitioner merely alleges that “[t]he model output in Djuric also compris[es] a plurality of values because the output includes ‘a trajectory confidence level for each predicted trajectory.’” Pet. at 30; Ex. 1003 at ¶ 94. This conclusory statement fails to establish that Djuric discloses the claimed limitation.

The claims do not merely require an output that contains values of any kind. *See* Ex. 2048 at ¶ 79. Rather, the claims require the “output representing hidden context” to comprise “a plurality of values.” Thus, the claimed values are tied to, and describe, the hidden context represented by the output. *See id.* For example, the ’579 patent explains that the values may describe hidden contextual information such as “awareness of a bicyclist of a vehicle following the bicyclist.” Ex. 1001 at 6:37-44.

As explained in Section VI.C.1 *supra*, Djuric does not teach generating an output that represents hidden context. Instead, Djuric generates predicted trajectories

and associated confidence levels for those trajectories. *See* Ex. 2048 at ¶ 80. Because Djuric’s output does not represent hidden context, its confidence levels likewise do not constitute values describing hidden context. *Id.*

Moreover, as to this limitation too, Tesla’s expert declaration adds nothing, as it merely regurgitates the Petition’s allegations. *Compare* Pet. at 30 *with* Ex. 1003, ¶ 94. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

Accordingly, Petitioner has failed to show that Djuric discloses the claimed “output comprising a plurality of values.” *See* Ex. 2048 at ¶ 83.

3. Djuric Does Not Teach “each value representing a likelihood of receiving a particular user response”

Petitioner does not contend that AA teaches “each value representing a likelihood of receiving a particular user response.” Rather, here again, Petitioner relies exclusively on Djuric. *See* Pet. at 29-31, 53, 55. That reliance fails because Djuric does not teach values representing a likelihood of receiving a particular user response.

Petitioner argues that Djuric teaches using “supervised training techniques,” including using “labeled” data and that “[s]uch labeled data used in supervised training is data labeled by a human.” Pet. at 30-31; Ex. 1003 ¶ 0095. Critically, however, Petitioner identifies no teaching in Djuric stating that the labels are

provided by human users as Petitioner alleges, much less any teaching of a value representing a likelihood of receiving a particular user response, as required by the challenged claims. *See* Ex. 2048 at ¶ 85. Instead, Petitioner cites only to its own expert’s declaration, which simply states “[i]t is my opinion that such labeled data used in supervised training is data labeled by a human.” Ex. 1003 at ¶ 95.

Expert testimony cannot supply a missing claim element. As the Office Patent Trial Practice Guide explains, “expert testimony cannot take the place of disclosure from patents or printed publications.” *See* OFFICE PATENT TRIAL PRACTICE GUIDE at § I.G. Where the prior art fails to disclose a claim limitation, expert testimony cannot cure the deficiency by importing the missing limitation into the reference. *See supra* Section III.A. Because Djuric does not disclose user responses or user input, Petitioner’s expert cannot supply that disclosure. Moreover, Petitioner’s expert declaration here again adds nothing to the analysis beyond parroting the allegation from the Petition. *Compare* Pet. 30-31 *with* Ex. 1003, ¶ 95. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

Accordingly, Petitioner fails to identify any disclosure in Djuric of “each value representing a likelihood of receiving a particular user response,” much less values representing a likelihood of receiving a user response concerning hidden

context. *See id.* The combination of Djuric and AA therefore fails to teach this element of the challenged claims. *See id.* at ¶ 88.

D. Djuric Does Not Teach “executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image” (Limitations 1[c], 13[c], and 20[c])

For these elements, Petitioner again alleges that Djuric’s goal-based prediction teaches hidden context. *See* Pet. at 33, 53, 55. But as discussed in Section VI.C *supra*, Djuric does not teach hidden context. As such, Petitioner’s allegations fail for the same reasons discussed in Section VI.C *supra*. Ex. 2048 at ¶ 89.

As to this claim element, Tesla’s expert’s declaration adds nothing, as its expert merely regurgitates the Petition’s allegations. *Compare* Pet. at 33 *with* Ex. 1003, ¶ 99. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359. Thus, Dr. Janét’s opinions should be given little to no weight.

E. Djuric Does Not Teach “determining a measure of uncertainty for each of the plurality of values” (Limitations 1[d], 13[d], and 20[d])

Djuric does not teach “determining a measure of uncertainty for each of the plurality of values,” as required by the challenged claims. As discussed above with respect to elements 1[a-iii], 13[a-iii], and 20[a-iii], Petitioner alleges that Djuric’s trajectory confidence levels are the claimed “plurality of values.” *See* Section VI.C.2. Here, however, Petitioner alleges that the claimed “measure of uncertainty” is Djuric’s “way-point confidence level.” Pet. at 34, 53, 55. Djuric makes clear that

these way-point confidence levels relate to way-points within a predicted trajectory (see Ex. 1004 at [0085]), but nothing in Djuric describes determining these way-point confidence levels for any trajectory confidence level, i.e., Petitioner’s alleged “plurality of values.” Petitioner’s theory is thus inconsistent with the language of the challenged claims and should be rejected. Ex. 2048 at ¶ 91.

Moreover, as discussed above, each of the “plurality of values” must “represent[] a likelihood of receiving a particular user response.” See Section VI.C.2. Because Djuric does not teach that limitation, it likewise does not teach “determining a measure of uncertainty for each of the plurality of values” for the same reasons.

As to this claim element too, Tesla’s expert declaration adds nothing, as its expert merely regurgitates the Petition’s allegations. *Compare* Pet. at 34-36 with Ex. 1003, ¶¶ 100-103. See *Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359. Thus, Dr. Janét’s opinions should be given little to no weight.

F. Challenged Dependent Claims

As discussed above, Djuric does not teach or suggest certain limitations of claims 1, 13, and 20. Each of the remaining challenged claims in Grounds 1, 3, and 5 depend from one of those independent claims, and Djuric and AA (or the other references relied on in Grounds 3 and 5) do not render them obvious for the same reasons.

G. A POSITA Would Not Have Been Motivated to Combine Djuric and AA

Even setting aside Petitioner’s failure to demonstrate how various claim elements are taught by the prior art, Petitioner separately fails to establish that a POSITA would have been motivated to combine Djuric and AA. *See id.* The Petition falls far short of its burden to provide explicit analysis of a reason to combine those references. *See KSR*, 550 U.S. at 418. The Federal Circuit has repeatedly held that obviousness requires more than “mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d at 988; *accord Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008); *see also LG Elecs. Inc. v. Cellular Commc’ns Equip. LLC*, IPR2016-00197, Paper 7 at 7-11 (P.T.A.B. Apr. 29, 2016).

Petitioner’s first proposed modification to Djuric in view of AA is that “[t]he model in the Djuric-AA combination teaches a probabilistic convolutional neural network.” Pet. at 20. However, neither Petitioner nor its expert explain *what* problem in Djuric would have prompted a POSITA to turn to AA for this modification. *See* Ex. 2048 at ¶ 95. Djuric discloses a complete, functioning system directed to trajectory prediction. AA discloses a complete, functioning system directed to pose-based motion prediction. The references address different technical problems and

employ different approaches. Where each reference independently performs its intended function, a POSITA would have no apparent reason to combine them. *See Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012) (“Because each device independently operates effectively, a person having ordinary skill in the art . . . would have no reason to combine the features of both devices into a single device.”). This deficiency is particularly glaring because Petitioner claims that both Djuric and AA already disclose a PNN. Pet. at 23-24; Ex. 1003 at ¶¶ 86, 87. Assuming *arguendo* that this is correct, Petitioner never explains why a POSITA examining Djuric would need to consult AA to satisfy the PNN limitation in the first place. *See* Ex. 2048 at ¶ 96.

Petitioner’s second proposed modification to Djuric in view of AA is that “[t]he model in the Djuric-AA combination generates a feature vector as described in AA.” Pet at 20. Petitioner does not identify any shortcoming of Djuric that would be addressed through this modification. Ex. 2048 at ¶ 96. This is thus not a situation where “there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 402 (2007). Instead, Petitioner relies on hindsight reconstruction of the claimed invention. *See, e.g., In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999) (referring to “[c]ombining prior art references . . . [by] simply tak[ing] the inventor’s

disclosure as a blueprint for piecing together the prior art to defeat patentability” as “the essence of hindsight”); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, (Fed. Cir. 1985) (“The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time.”).

Petitioner also relies on generic assertions that the combination would have been “a natural, predictable refinement,” that implementation “would also be straightforward,” that the combination would use “known techniques,” and that it would be a “predictable combination of well-known prior art elements.” Pet. 21-22, 59-60; Ex. 1003 at ¶¶ 80-82. Such statements merely assert that a POSITA could combine the references, not that a POSITA would have been motivated to do so. The Federal Circuit has repeatedly rejected this type of conclusory reasoning as insufficient and infected by hindsight bias. *See InTouch Techs., Inc. v. VGo Communs., Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (citing *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (“[T]he expert’s testimony on obviousness was essentially a conclusory statement that a person of ordinary skill in the art would have known, based on the ‘modular’ nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions. This is not sufficient and is fraught with hindsight bias.”)).

Moreover, the references themselves teach away from the proposed combination. *See* Ex. 2048 at ¶ 98.

First, Djuric emphasizes reducing computational burden and increasing efficiency. *See id.* at ¶ 99. Djuric repeatedly explains that its approach improves trajectory prediction while reducing computational requirements, enabling smaller models, increased processing speed, and more efficient use of limited onboard vehicle resources. For example, Djuric explains:

The systems and methods enable the vehicle technology to more accurately predict future locations of objects, **while reducing the computational resources needed to do so Such a focused processing approach can increase computational speeds** as well as provide more accurately predicted object trajectories. Additionally, use of a machine-learned model as described herein can allow for parallelization of the process, rather than being run in sequence. Moreover, the combined data set **can allow the model's network to be smaller and, thus, use less computational resources (e.g., processing, storage, etc.) and run more efficiently.** This improvement is particularly advantageous for a vehicle computing system because the vehicle computing system has limited computational resources onboard the vehicle and is running in real-time, as the vehicle is travelling.

Ex. 1004 at ¶ 0037 (emphases added); *see also id.* at ¶¶ 0021, 0031. By contrast, AA relies on sophisticated image-processing techniques, including pose estimation,

image segmentation, registration, and modeling detailed relationships among body joints. *See* Ex. 1005 ¶¶ 0035-0038, 0063, 0070; *see also* Ex. 2048 at ¶ 100. Incorporating AA's framework into Djuric would substantially increase computational complexity and resource consumption, not to mention the additional complexity needed to integrate the above listed sophisticated image-processing techniques into Djuric's system, directly undermining the objectives that Djuric identifies as important advantages of its system. *See* Ex. 2048 at ¶ 100. Djuric therefore teaches away from the proposed modification. *See id.*

Second, AA likewise teaches away from Djuric's approach. *See id.* at ¶ 93. AA explains that models that "use predicted [] locations at one point in time to predict [] locations at a future point in time," such as the system of Djuric, are not meant to handle "the complexity of subject body motion, occlusion of joints in captured images, false detections of joints, and the like." Ex. 1005 at ¶ 0051. AA therefore focuses on detailed modeling of body poses and joint relationships. *See* Ex. 2048 at ¶ 93. Djuric, by contrast, is concerned with predicting trajectories of moving objects. *See* Ex. 1004 at ¶ 0002; Ex. 2048 at ¶ 101. AA's detailed pose-tree analysis serves a fundamentally different purpose than Djuric's trajectory-prediction framework. *See* Ex. 2048 at ¶ 101. A POSITA seeking Djuric's streamlined

trajectory prediction would have no reason to adopt AA's significantly more complex architecture. *See id.*

Third, Petitioner's own obviousness theory demonstrates hindsight reconstruction. *See id.* at ¶ 102. Petitioner contends that Djuric already discloses a probabilistic neural network because its trained model may include a Bayesian network, while AA allegedly discloses a probabilistic neural network because it generates probability distributions. *See Pet.* at 23-24; Ex. 1003 at ¶¶ 86, 87. Having made those assertions, Petitioner then states:

The '579 Patent[] explains that its neural network can be a “probabilistic convolutional neural network.” EX1001, 5:56-60. In view of this teaching and as described above, it would have been obvious to a POSITA to implement Djuric using a PNN as taught by AA (a probabilistic neural network).

Id. (emphasis added).

This statement expressly uses the '579 patent's teachings as the reason to combine the prior-art references. *See Ex.* 2048 at ¶ 102. Rather than identifying a motivation arising from the prior art itself, Petitioner begins with the patented solution and works backwards to construct a combination that resembles the claimed invention. *See id.* That is precisely the type of hindsight reconstruction that the Federal Circuit has repeatedly condemned. *See Interconnect Planning Corp.*, 774 F.2d at 1138 (“The invention must be viewed not with the blueprint drawn by the

inventor, but in the state of the art that existed at the time.”); *Insite Vision Inc. v. Sandoz, Inc.*, 783 F.3d 853, 859 (Fed. Cir. 2015) (“Defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness.”).

Thus, a POSITA would not have been motivated to combine Djuric and AA, but the Board need not reach this analysis as Petitioner failed to carry its burden at the outset to provide explicit analysis of a reason to combine Djuric and AA. *See KSR*, 550 U.S. at 418; *In re Kahn*, 441 F. 3d at 988.

VII. GROUNDS 2, 4, 6: THE CITED REFERENCES (DJURIC, AA, AND COX) DO NOT RENDER THE CHALLENGED CLAIMS UNPATENTABLE

The challenged claims are not unpatentable in view of Grounds 2, 4, or 6. Ground 2 of the Petition alleges that the challenged claims are obvious in view of Djuric, AA, and Cox, whereas Grounds 4 and 6 allege obviousness over Djuric, AA, and Cox in view of Rolfe or Ross. *See* Pet. at 11. However, as discussed below, Djuric fails to teach several limitations of the challenged claims, and those defects

are not cured by the addition of AA or Cox, or by the further addition of Rolfe or Ross.³

A. Cox

Cox “relates to machine learning, in particular to machine learning augmented by measurements acquired from human populations.” Ex. 1008 at ¶ 0001. Cox explains that “[t]raditional machine-learning algorithms typically incorporate human knowledge (at least implicitly) as an input.” *Id.* at ¶ 0002; Ex. 2048 at ¶ 107. Cox gives the specific example of “a machine-learning system trained to decide whether a face is present in an image will be given set of human-generated ‘ground truth’ labels that signal whether a human judged the image to contain a face or not.” *Id.* “In this case, the job of the machine-learning system is to emit analogous labels (for

³ Unless otherwise noted, Patent Owner’s arguments in this section refer to Petitioner’s allegations concerning Ground 2. However, Patent Owner’s arguments herein apply equally to Grounds 4 and 6. For Grounds 4 and 6, Petitioner does not rely on Rolfe or Ross as allegedly teaching any of the elements that, as discussed herein, Djuric, AA, and Cox do not teach. *See* Pet. at 65, 70-74. Instead, those grounds merely rely on Rolfe or Ross as allegedly teaching elements of dependent claims. *See id.*

example, ‘face present’ and ‘face not present’) in response to new, previously unseen images.” *Id.*

Cox describes using “psychometric data” as an additional input in the machine learning system, in addition to human annotations of the image. *See id.* at ¶¶ 0005-0010; Ex. 2048 at ¶ 109. The “psychometric data” can be used to determine the degree of “penalization” for misclassifying the image (i.e., indicating that the image contains a face when it does not, or vice versa), because “greater penalties may be introduced for misclassification . . . of examples that are easily classified by humans” and “lesser penalties may be introduced for misclassification of examples that are relatively more difficult for humans to classify.” *See id.* at ¶¶ 0005, 0008, 0010; *see* Ex. 2048 at ¶ 109. These penalties are used in a “human-weighted loss function” to train the model, with the aim of improving its accuracy. *See id.*

Finally, Cox explains that:

Embodiments of the present invention incorporate a substantial pool of detection data (e.g., more than ten thousand subjects with one hundred trials per subject across all conditions, tested with approximately 7,500 face images) for occluded faces in very large, noisy, perpendicularly obstructed, and Simoncelli textured configurations. These scenarios represent an important set of difficult circumstances for detection, enabling the location of more faces through a better understanding of difficult examples during classifier training.

(Ex. 1008 at ¶ 0047), and provides results on face classification in figures 9, 10 and 11. The focus of Cox (training, testing, use of loss functions, etc.) is primarily on face classification. *See* Ex. 2048 at ¶ 112.

B. Djuric, AA, and Cox Do Not Teach “generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image” (Limitations 1[a-iii], 13[a-iii], and 20[a-iii])

For Grounds 2, 4, and 6, Petitioner contends that Djuric in view of AA and Cox teach the elements of the independent claims, relying only on the additional references in Grounds 4 and 6 for certain dependent claims. *See* Pet. at 55-73. As set forth above in Section VI, Djuric and AA do not teach the above limitations of the challenged independent claims. Those same shortcomings equally doom Grounds 2, 4, and 6, as Petitioner refers back to its theories for Ground for the above limitations. Those deficiencies are dispositive and apply equally to Grounds 2, 4, and 6. Thus, for all the same reasons discussed in Section VI with respect to Grounds 1, 3, and 5, the Board should conclude that Grounds 2, 4, and 6 do not render obvious any of the challenged claims.

Petitioner attempts to address certain deficiencies in its Grounds 1, 3, and 5 analysis, particularly with respect to limitations 1[a-iii], 13[a-iii], and 20[a-iii], by adding Cox to the asserted combination. The addition of Cox, however, does not

cure the deficiencies identified above and instead introduces further defects, as discussed below.

1. Djuric and Cox Do Not Teach “hidden context”

Petitioner does not contend that Cox teaches the claimed “hidden context.” *See* Pet. at 60-64. Rather, just as it did with respect to Grounds 1, 3, and 5, Petitioner relies exclusively on Djuric for this limitation in Grounds 2, 4, and 6, again relying solely on Djuric’s predicted trajectories as allegedly being the claimed hidden context. *See* Pet. at 61; Ex. 1003, ¶ 163 (citing Ground 1 allegations). As discussed above with respect to Grounds 1, 3, and 5, neither Djuric nor AA teach hidden context. *See* Section VI.C; *see also* Ex. 2048 at ¶ 114. The addition of Cox does not address this shortcoming. Nor does Petitioner even allege as much, as Petitioner merely relies on Cox as purportedly supplying the “representing a likelihood of receiving a particular user response from a user presented with the image” limitation of elements 1[a-iii], 13[a-iii], and 20[a-iii]. *See* Pet. at 61-65, 67, 70. The combinations of art in Grounds 2, 4, and 6 therefore fail to teach the claimed hidden context.

Because the Petition does not allege that Cox teaches the claimed hidden context (*see id.*), the Board need not consider whether Cox does so. *See Liberty Mut.*, Paper 8 at 14-15 (“[W]e address only the basis, rationale, and reasoning put forth by

the Petitioner and resolve all vagueness and ambiguity in Petitioner’s arguments against the Petitioner.”) *see also, e.g., In re NuVasive, Inc.*, 841 F.3d 966, 971-72 (Fed. Cir. 2016) (vacating Board’s unpatentability finding based on portion of reference not raised in petition); *Juniper Networks, Inc. v. Swarm Technology LLC*, IPR2021-01445, Paper 62 at 28-29 (P.T.A.B. Feb. 7, 2023) (refusing to consider arguments raised in petitioner’s reply but not contained in petition). However, to the extent the Board considers the issue, Cox likewise does not teach the claimed hidden context.

Cox is directed to using “large sets of human-derived data containing different types of information” to provide “ground-truth labels for regularization of machine-learning systems.” Ex. 1008 at ¶ 0005. More specifically, Cox seeks to improve machine learning performance by incorporating human-generated labels and thereby producing more “human-like” results. *See id.*; *see also id.* at ¶ 0016; Ex. 2048 at ¶ 115.

To accomplish this goal, Cox trains machine learning systems to identify and classify features that are present in an image. *See* Ex. 2048 at ¶ 116. For example, Cox describes presenting participants with images and asking them to identify a person’s gender, determine whether a face is present in a partially obscured image, or select an emotion corresponding to a facial expression. Ex. 1008 at ¶ 0016; *see*

also Ex. 2048 at ¶ 116. The resulting human-generated labels are then used to train a machine learning system that can better detect faces despite image noise or occlusion and assign visual attributes to images. Ex. 1008 at ¶ 0016. Cox explains that the trained system may determine that an image contains a man who is smiling, has a beard, and is wearing a hat, or may identify objects such as a tree, car, bus, building, or street. Ex. 2048 at ¶ 116.

Thus, Cox is directed to recognizing and labeling observable features and objects contained in an image. *Id.* The outputs of Cox identify what is visible in the image and assign corresponding labels. *Id.* Cox does not infer latent information that is not directly observable from the image, nor does it predict underlying mental states, intentions, awareness, goals, or other hidden contextual information. *See id.* at ¶ 117.

This stands in sharp contrast to the '579 patent, which is directed to determining hidden context of a traffic entity, such as “a state of mind of a user,” “a task that a user . . . is planning on accomplishing,” “a goal of a user . . . wherein the user expects to achieve the goal within a threshold time interval,” “a near term goal,” “a degree of awareness of the person about the autonomous vehicle,” or “whether a bicyclist driving in front of the autonomous vehicle is likely to be aware that the autonomous vehicle is behind the bicycle.” Ex. 1001, 2:64-3:15. These forms of

hidden context are not directly visible in an image and instead require inference regarding a person's internal state, awareness, intentions, or likely behavior. *See* Ex. 2048 at ¶ 117.

Cox contains no disclosure of generating such hidden context information. *See id.* Rather, Cox identifies and labels observable image content. *See id.* Because Cox does not teach determining hidden context, it likewise does not teach generating output summary statistics of expected human responses describing a hidden context of a traffic entity, as required by the challenged claims.

As to this limitation too, Tesla's expert declaration adds nothing, as its expert merely regurgitates the Petition's allegations. *Compare* Pet. at 60-64 with Ex. 1003, ¶¶ 163-167. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

In sum, grafting Cox onto Djuric does not remedy the deficiencies of either Djuric or Cox with respect to the claimed "hidden context." *See* Ex. 2048 at ¶ 118.

2. Djuric and Cox Do Not Teach "the output comprising a plurality of values"

Petitioner attempts to rewrite the claim language such that "the model's output represent[] [s] a likelihood of receiving a particular user response from a user presented with the image." Pet. at 61; Ex. 1003 at ¶ 163 (emphasis in original); *see also* Ex. 2048 at ¶ 120. This is not what the claim requires. *See* Ex. 2048 at ¶ 120.

The claim language states “generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image.” Ex. 1001, claim 1. The grammatical structure of the claim is straightforward. *See id.* The output represents hidden context. *See id.* The output comprises a plurality of values. *See id.* And each value represents a likelihood of receiving a particular user response. *See id.* These are separate requirements that must each be satisfied.

The Petition rewrites the claim by treating the output itself as representing a likelihood of receiving a user response. *See* Ex. 2048 at ¶ 121. But that treatment eliminates the distinction drawn by the claim language between the output and the values contained within the output. *See id.* Under the claims, the output represents hidden context, while the values within that output represent likelihoods of receiving particular user responses. *See id.*

This distinction is significant because Petitioner does not contend that Cox teaches an output comprising “a plurality of values.” *See id.* Instead, Petitioner continues to rely on Djuric for that portion of the limitation. *See* Pet. at 61, 64. Petitioner’s attempt to characterize the output itself as a likelihood of receiving a user response appears designed to avoid the actual claim language and to make the

asserted combination of Cox, Djuric, and AA appear more closely aligned with the claims than it is. *See* Ex. 2048 at ¶ 121.

As to this claim element too, Tesla's expert declaration adds nothing, as its expert merely regurgitates the Petition's allegations. *Compare* Pet. at 60-64 *with* Ex. 1003, ¶¶ 163-167. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

C. Djuric Does Not Teach “executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image” (Limitations 1[c], 13[c], and 20[c])

As discussed in Section VI.C *supra*, Djuric does not teach hidden context. Petitioner again alleges for these elements that Djuric's goal-based prediction teaches hidden context. *See* Pet. at 60-64. Djuric fails to teach the hidden context recited in these elements for the same reasons discussed in Section VI.C *supra*. Ex. 2048 at ¶ 125.

As to this claim element too, Tesla's expert declaration adds nothing, as its expert merely regurgitates the Petition's allegations. *Compare* Pet. at 60-64 *with* Ex.

1003, ¶¶ 163-167. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

D. Djuric Does Not Teach “determining a measure of uncertainty for each of the plurality of values” (Limitations 1[d], 13[d], and 20[d])

As discussed in Section VI.E *supra* with respect to Grounds 1, 3, and 5, under Petitioner’s mapping of Djuric to the language of the challenged claims, Djuric does not teach “determining a measure of uncertainty for each of the plurality of values,” as required by the challenged claims. *See* Section VI.E. For Grounds 2, 4, and 6 and these limitations, Petitioner merely refers to its flawed argument for Grounds 1, 3, and 5. Petitioner’s theory is inconsistent with the language of the challenged claims and should be rejected for the same reasons discussed above with respect to Grounds 1, 3, and 5. Ex. 2048 at ¶ 126.

E. Challenged Dependent Claims

As discussed above, Djuric does not teach or suggest certain limitations of claims 1, 13, and 20. Each of the remaining challenged claims in Grounds 2, 4, and 6 depend from one of those independent claims, and Djuric, AA, and Cox (or the other references relied on in Grounds 4 and 6) do not render them obvious for the same reasons.

F. A POSITA Would Not Have Been Motivated to Combine Djuric, AA, and Cox

As set forth above, for Grounds 1, 3, and 5, Petitioner has not shown that a POSITA would have been motivated to combine AA with Djuric. *See* Section VI.G. For Grounds 2, 4, and 6, Petitioner does not make any additional allegations with respect to this issue. *See* Pet. at 57-60. A POSITA would not have been motivated to combine Djuric and AA in the manner alleged for Grounds 2, 4, and 6 for the same reasons discussed above with respect to Grounds 1, 3, and 5. *See* Section VI.G. In addition, Petitioner has not shown that a POSITA would have been motivated to combine Cox with Djuric and AA. *See* Ex. 2048 at ¶ 127.

As discussed above, Cox is generally directed to determining the presence or absence of a face in images, whereas Djuric generally relates to predicting the trajectory of an object in a road scene. As Dr. Saber explains, Cox's machine learning system is specifically designed for the tasks it is intended to accomplish, including the design of the network architecture, the regularization methodology applied, and the selection of the particular loss function employed (a human weighted loss function instead of a hinge loss function). Ex. 2048, ¶¶ 128-132; *see also* Ex. 2057 at 1; Ex. 2058 at 1 (both explaining unique challenges to autonomous vehicle system design). Given that Djuric's system is designed for completely different purposes than those of Cox, Djuric's system requires different system

designs with different training and validation processes and different datasets. Ex. 2048, ¶¶ 128-132. Tesla and its expert do not address these differences, and do not articulate how the proposed combination would function in view of these differences. Thus, Tesla has not supplied the requisite articulated reasoning with rational underpinnings in its obviousness assertions. *In re Kahn*, 441 F. 3d at 988.

In addition, Cox states that it does not deal in higher levels of complexity, as does AA:

Attributes may be considered individual “building blocks” for higher-level recognition tasks, with their own complexities and challenges regarding features and training. **Thus, rather than initially tackling the more complex problem of face identity, embodiments of the invention consider attributes as a distinct problem.** Existing algorithms for attributes have not been informed by human behavior by any significant measure, making embodiments of the invention a novel alternative.

Id. (emphasis added). As previously explained in Section VI.B, AA requires complex processes such as the segmentation of frames and registration of features across imagery. *See* Ex. 2048 at ¶ 132. AA already performs much more complex image recognition processes than does Cox, and a POSITA would have no reason to look outside of AA to Cox, because AA has no use for simple binary classifications.

See id. Therefore, a POSITA would not combine Cox with AA, as the levels of complexity required in AA would render Cox useless. *See id.*

Further, Petitioner and its expert do not address *what* is missing from Djuric and AA that would cause a POSITA to turn to Cox. *See id.* at ¶ 135. Djuric discloses a fully functioning system. *See id.* AA discloses a distinct, fully functioning system. *See id.* And Cox also discloses a distinct, fully functioning system. *See id.* The working system of Cox with its primary focus the classification of attributes (*see, e.g.,* Ex. 1008 at ¶ 0049), addresses a different problem than both the working system of Djuric, which is focused on predicting the trajectory of a moving object (*see, e.g.,* Ex. 1004 at ¶ 0031), and the working system of AA, which is focused on predicting the motion of a subject based on the subject's body poses (*see, e.g.,* Ex. 1005 at ¶¶ 0001-0005). *See* Ex. 2048 at ¶ 135. When each prior art reference offers a complete solution, as do each of Cox, Djuric, and AA, a POSITA would have no reason to combine the references. *See Kinetic Concepts*, 688 F.3d at 1369 (“Because each device independently operates effectively, a person having ordinary skill in the art . . . would have no reason to combine the features of both devices into a single device.”); *see also* Ex. 2048 at ¶ 135.

Even as to the alleged motivation to combine, Tesla's expert's declaration adds nothing, as its expert merely regurgitates the Petition's allegations. *Compare*

Pet. at 57-60 *with* Ex. 1003, ¶¶ 157-161. *See Xerox*, Paper 12 at 5; *Ethicon*, 844 F.3d at 1348, 1352; *TQ Delta*, 942 F.3d at 1359.

Thus, a POSITA would not have been motivated to combine Cox, Djuric, and AA, but the Board need not reach this analysis as Petitioner failed to carry its burden at the outset to provide explicit analysis of a reason to combine Cox, Djuric, and AA. *See KSR*, 550 U.S. at 418.

VIII. THE PETITION FATALY FAILS TO ADDRESS THE *GRAHAM* FACTORS WITH RESPECT TO ANY GROUND

As set forth in Section IV.C, the Petition’s obviousness assertions must address the *Graham* factors, which include a requirement to explain the differences between the challenged claims and the prior art. Even though petitions for IPR “must address the *Graham* factors,” Petitioner’s allegations fail to do so. *See Eizo Corp.*, Paper 11 at 29-30 (citing *Graham*, 383 U.S. at 17-18).

Here, with respect to all its Grounds, Petitioner alleges that “to the extent” the claim limitations are not explicitly disclosed by Djuric, they are disclosed by AA, Cox, and/or Rolfe. Pet. at 24 (“To the extent not explicitly disclosed by Djuric, AA describes”), 55 (“To the extent Djuric alone does not render obvious . . . the claimed operations are also disclosed by Cox”), 65, 71, 73. However, this type of conclusory analysis fails to identify the differences between the claimed subject matter and the prior art and is insufficient. For example, the Board faulted the

petitioner in *Eizo Corp.* for failing to identify the differences between the claimed subject matter and the prior art. Paper 11 at 29-30. In particular, the Board found insufficient the petitioner's "conclusory assertion" that "[t]o the extent [the first reference] may not explicitly teach" the limitation, the second reference "explicitly teaches this limitation." *Id.* at 30. The Board explained that "such an assertion fails to resolve the exact differences sought to be derived from" the second reference. *Id.* (finding that petitioner had not shown a reasonable likelihood of prevailing on that ground). Other Board decisions have reached the same result. *See, e.g., Moses Lake Indus., Inc.*, Paper 6 at 18; *eBay, Inc.*, Paper 15 at 21.

This is not a trivial defect. The Supreme Court has explicitly stated that the *Graham* factors, including the "differences between the prior and the claims at issue," provide the necessary "background" against which the "the obviousness or nonobviousness of the subject matter is determined." *Graham*, 383 U.S. at 17-18. Petitioner's wholly incomplete analysis in this regard is akin to the faulty analysis in *Eizo Corp.* For at least these additional reasons, Petitioner has not shown a reasonable likelihood of prevailing on any Ground.

IX. TESLA FAILED TO SHOW THAT CERTAIN LIMITATIONS ARE PRINTED MATTER NOT ENTITLED TO PATENTABLE WEIGHT

Tesla asserts that the challenged claims include limitations that are not entitled to patentable weight under the printed matter doctrine.⁴ To prevail on this assertion, Tesla must make two showings. First, Tesla must show that the claim limitations constitute printed matter. Second, even if the claim limitations recite printed matter, Tesla must show that the limitations are *not* functionally or structurally related to the physical substrate holding the printed matter. Only if Tesla makes both showings are the claim limitations not given patentable weight in the invalidity analysis. As set forth below, Tesla has not, and cannot, meet its burden on either prong of the printed matter test. *See FanDuel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1341 (Fed. Cir. 2020) (“In an inter partes review, the burden of persuasion is on the petitioner to prove ‘unpatentability by a preponderance of the evidence,’ 35 U.S.C. § 316(e), and that burden never shifts to the patentee.”).

⁴ The printed matter doctrine is disfavored, “stand[ing] on questionable legal and logical footing.” *In re Lowry*, 32 F.3d at 1583 (citing *In re Gulack*, 703 F.2d 1381, 1385 n.8 (Fed. Cir. 1983)).

A. The Claim Limitations At Issue Are Not Printed Matter

A claim limitation is printed matter “*only* if it claims the content of information.” *In re DiStefano*, 808 F.3d 845, 848 (Fed. Cir. 2015) (emphasis added). Stated differently, “printed matter must be matter claimed *for what it communicates*.” *Id.* at 850 (emphasis added). To be considered printed matter, the claimed information must be “useful and intelligible only to the human mind.” *In re Lowry*, 32 F.3d at 1583 (citations omitted). “[P]rinted matter cases have no factual relevance where ‘the invention as defined by the claims *requires* that the information be processed not by the mind but by [a] computer.’” *Id.* (emphasis in original).

Cases finding printed matter illustrate these requirements. Limitations covering markings on the face of a game die were found to be printed matter. *In re Marco Guldenaar Holding B.V.*, 911 F.3d 1157, 1161 (Fed. Cir. 2018). This is because “[e]ach die’s marking or lack of marking communicates information to participants indicating whether the player has won or lost a wager” *Id.* Limitations covering markings on a vascular access port were found to be printed matter. *CR Bard Inc. v. Angiodynamics, Inc.*, 979 F.3d 1372, 1381 (Fed. Cir. 2020). The markings’ purpose was to inform a medical provider that the vascular access port was suitable for a particular type of procedures, and thus “directed to *the content of the information conveyed*.” *Id.* at 1381-82 (emphasis added). Limitations covering “identifying marks” on meat were found to be printed matter. *In re McKee*, 64 F.2d

379, 379-80 (CCPA 1933). The markings’ purpose was to inform a person of the origin of the meat or its producer. *Id.* Limitations covering a prescription label were found to be printed matter. *King Pharms., Inc. v. Eon Labs., Inc.*, 616 F.3d 1267, 1279 (Fed. Cir. 2010). The label’s instructions advised a patient to take a prescription with food. *Id.* The common thread in these cases is that the printed matter communicated specific information to a human.

Cases refusing to find a claim limitation to be printed matter are also instructive. Limitations covering a data structure including a plurality of attribute data objects stored in memory were not found to be printed matter. *In re Lowry*, 32 F.3d at 1583. The limitations at issue did not “claim merely the information content of a memory.” *Id.* Moreover, the Federal Circuit refused to extend the printed matter doctrine to information stored in memory, which was processed by a computer rather than conveyed to a human being. *Id.* A limitation of “selecting a first element from a database including web assets authored by third party authors and web assets provided to the user interface from outside the user interface by the user” was not found to be printed matter. *In re DiStefano*, 808 F.3d 848-851. The Federal Circuit found that the limitation did not claim the *content* of information. *Id.* at 851 (“Although the selected web assets can and likely do communicate some information, *the content of the information is not claimed.*”) (emphasis added).

Here, Tesla identifies ten claim limitations and alleges that they constitute printed matter. Pet. at 74-75. Tesla's allegations are conclusory and lack any meaningful analysis. Tesla never explains how any of those limitations claim the content of information, as required by Federal Circuit precedent. For example, Tesla generically asserts that "each [limitation] recites a data element [] and then defines that data element based on its content." Pet. at 75. But this allegation is plainly false as none of the limitations claim content. None of the limitations recite "matter claimed for what it communicates." *In re DiStefano*, 808 F.3d at 850.

For example, the first claim limitation identified by Tesla is "an image of traffic, the image displaying a traffic entity belonging to the traffic." While the claimed "image" is defined as "displaying a traffic entity belonging to the traffic," the claim limitation does not attempt to claim specific content. The modifier "displaying a traffic entity belonging to the traffic" merely describes the *types* of input images received and used in the computer-implemented method.

The remaining limitations are similar in that they do not describe or claim specific content. Instead, they merely describe the types of information involved in the computer-implemented method. These limitations are very different from those found to constitute printed matter for their communicative content, such as markings on a die that inform a game participant if they won, markings on a medical device

that indicate to a doctor the device's suitability for a particular procedure, markings on meat to identify the meat's origin, or instructions on a prescription label to take a drug with food. *See supra*. Simply put, the limitations here bear no resemblance to those found to constitute printed matter.

Tesla also failed to address that several claim elements recite information that is not "useful and intelligible only to the human mind." *In re Lowry*, 32 F.3d at 1583 (citations omitted). For example, Tesla claims that "output representing hidden context" is printed matter. But claim 1 is a computer-implemented method that involves "generating output representing hidden context," and "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image." *See id.* (rejecting application of printed matter doctrine to information processed by a computer). Here, the claimed information is used by a computer system to perform computational functions, not by a human reader to receive a message.

Accordingly, Tesla has not met its threshold burden of showing that the claim limitations recite printed matter.

B. The Alleged Printed Matter Is Functionally Related to the Substrate

Even if Tesla were to prevail on its claim that the limitations constitute printed matter, it cannot prevail on the second prong of the printed matter test. Printed matter

is given patentable weight if the “claimed informational content has a functional or structural relationship to the substrate.” *In re DiStefano*, 808 F.3d at 850. A limitation deemed to be printed matter is entitled to patentable weight if it is “interrelated with the rest of the claim.” *Praxair Distrib., Inc. v. Mallinckrodt Hosp. Prods. IP Ltd.*, 890 F.3d 1024, 1032, 1035 (Fed. Cir. 2018) (“By interrelating the claimed information regarding correlations between nitric oxide, LVD, and pulmonary edema with the concrete step of discontinuing treatment of the information . . . the printed matter . . . has a functional relationship to the rest of the claim[,] giving the printed matter patentable weight.”). The Federal Circuit further “consider[s] whether the printed matter merely informs people of the claimed information, or whether it instead interacts with the other elements of the claim to create a new functionality in a claimed device or to cause a specific action in a claimed process.” *C R Bard Inc.*, 979 F.3d at 1381.

Cases finding that printed matter is entitled to patentable weight illustrate the requisite functional relationship. In *In re Miller*, the court reversed a finding of printed matter regarding “measuring indicia” and a “legend” printed on the side of a volumetric measuring device. 418 F.2d 1392, 1395-96 (CCPA 1969). These limitations were given patentable weight because the indicia and legend enabled a user to measure specific volumes accurately and were thus integral to the

functionality of the measuring device. *Id.* In *In re Gulack*, a claim limitation capturing a sequence of digits (“plurality of individual digits”) printed on an endless wrist band (“educational and recreational mathematical device”) constituted printed matter. 703 F.2d at 1385. Nevertheless, “the sequence deserved patentable weight because the informational content of the sequence (what numbers were represented) was functionally related to the endless-band physical structure of the substrate.” *In re DiStefano*, 803 F.3d at 850 (citing *In re Gulack*, 703 F.2d at 1385).

Here, Tesla has not, and cannot, demonstrate that the cited limitations are *not* functionally related to the substrate. Tesla asserts, in conclusory fashion, that “[t]he above printed matter limitations do not have any such functional relationship with the ‘substrate,’ which in this case is computer memory.”⁵ Pet. at 76. But this

⁵ Tesla fails to explain why the alleged substrate is “computer memory.” Assuming Tesla is correct, this is reason enough to disregard Tesla’s printed matter challenge. See *In re Lowry*, 32 F.3d at 1583 (“[T]he Board erroneously extended a printed matter rejection under sections 102 and 103 to a new field in this case, which involves information stored in a memory. . . . The printed matter cases have no factual relevance where ‘the invention as defined by the claims requires that the

allegation is not true at all. For example, claim 1 is a computer-implemented method that “generat[es] a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature,” “generat[es] output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image,” “execut[es] the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image,” “determine[es] a measure of uncertainty for each of the plurality of values,” and “navigat[es] the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network.” Each of the challenged limitations participates directly in this sequence of operations. The information is not merely stored in memory or presented to a user; it drives the generation of training data, the training of the model, the prediction produced by the claimed method, and the ultimate controlling of the autonomous vehicle. The challenged limitations are therefore functionally intertwined with the operation of the claimed

information be processed not by the mind but by a machine, the computer.””) (citations omitted).

process. One would be hard pressed to find limitations more fundamentally related to the function of the computer-implemented method. Indeed, removing the challenged limitations would fundamentally alter how the claimed method operates. That is the hallmark of a functional relationship under Federal Circuit precedent.

In sum, the challenged claim limitations do not comprise printed matter. Even if they did, any alleged printed matter is still entitled to patentable weight.

X. CONCLUSION

As this Response shows, the Grounds in the Petition do not invalidate any of the claims of the '579 patent. For the foregoing reasons, Patent Owner respectfully requests that the Board hold that Petitioner has not met its burden and uphold the patentability of all claims of the '579 patent.

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Patent Owner's Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 13,132 words, excluding the parts of this Patent Owner's Response that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Response.

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Patent Owner's Response was served on July 8, 2026, to Lead and Back-up Counsel for Petitioner at the service address provided in Petitioner's Mandatory Notices:

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