

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

PATENT OWNER'S PRELIMINARY RESPONSE

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I. INTRODUCTION

Pursuant to 35 U.S.C. § 313 and 37 C.F.R. § 42.107, Patent Owner Perceptive Automata LLC (“Perceptive”) submits this Preliminary 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 not institute *inter partes* review because Petitioner has not met its burden of showing a reasonable likelihood of prevailing on any of its proposed grounds of unpatentability, each based on obviousness under 35 U.S.C. § 103(a).

The Petition suffers from fundamental flaws, each of which warrants denial of institution. First, Petitioner’s Ground 1 allegations rely on a combination of Djuric and AA. When stating a reason to combine these references, Petitioner expressly admits to using the teachings of the ’579 patent as a blueprint. This is legally improper as it introduces impermissible hindsight bias. Moreover, the purported rationale for combining Djuric and AA is unclear and lacks the requisite articulated reasoning for combining the references. Finally, the combination results in extra processing, which violates the stated purpose of Djuric. Thus, Djuric teaches away from the combination. These flaws infect all Grounds of the Petition, thus warranting denial.

Additionally, the Petition's allegations are deficient because the references of the proposed grounds do not teach all limitations of the challenged claims. Thus, the combination does not render the challenged claims obvious.

Further, Petitioner fails to address the *Graham* factors, which is an express prerequisite to showing obviousness. This defect also warrants denial of all grounds.

Finally, Petitioner's grounds are redundant, and Petitioner failed to adequately explain whether and why one ground is preferred over another. Specifically, Ground 1 is a combination of Djuric and AA, Ground 2 is a combination of Djuric, AA, and Cox, Ground 3 is combination of Djuric, AA, and Rolfe, Ground 4 is a combination of Djuric, AA, Cox, and Rolfe, Ground 5 is a combination of Djuric, AA, and Ross, Ground 6 is a combination of Djuric, AA, Cox, and Ross. Despite the redundancy of the six grounds, none of the permutations disclose or render obvious the independent claims of the '579 patent. Indeed, Petitioner's reliance on so many different combinations highlights not only the deficiencies of Djuric but also the secondary references.

To justify the institution of an *inter partes* review, Petitioner must establish that there is a "reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For at least

the reasons discussed in this Preliminary Response, Petitioner has not shown a reasonable likelihood of prevailing on any of the challenged claims.

II. THE '579 PATENT AND THE CHALLENGED CLAIMS

A. Overview of the '579 Patent

The inventions disclosed and claimed in the '579 patent generally relate to systems, computer-implemented methods, and computer readable media 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 '579 patent discloses training the probabilistic network. *Id.* at 2:49, 2:41-49. “The probabilistic neural network generates a feature vector for a plurality of features.” *Id.* at 2:10-19. “The feature vector comprises values describing statistical distribution for each feature.” *Id.* The '579 patent discloses receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic. *Id.* at 2:19-28. The '579 patent further discloses “execut[ing] the probabilistic neural network to generate output representing hidden context for a traffic entity displayed in the new image.” *Id.* The '579 patent also discloses “determin[ing] a measure of uncertainty for each of the plurality of values, and navigating the autonomous vehicle “to avoid the traffic entity identified in the new image[,], [t]he navigation [] based on at least the measure of uncertainty generated by the probabilistic neural network.” *Id.* at 2:50-63.

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

For the limited purpose of this Preliminary Response, Patent Owner does not contest Petitioner's definition of a person of ordinary skill in the art but reserves the right to do so if trial is instituted.

IV. 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'"). Should the Board determine to institute trial in this proceeding, Patent Owner reserves the right to argue for construction of certain claim terms.

V. APPLICABLE LEGAL STANDARDS

The Board may only grant a petition for *inter partes* review where "the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(c). Petitioner bears the burden of showing that this statutory threshold has been met. *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."); *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); *see also* USPTO, OFFICE PATENT TRIAL PRACTICE GUIDE, Statutory Requirements (Dec. 12, 2025) (“The Board . . . may institute a trial where the petitioner establishes that the standards for instituting the requested trial are met Conversely, the Board may not authorize a trial where the information presented in the petition, taking into account any patent owner preliminary response, fails to meet the requisite standard for instituting the trial.”).

Each of Petitioner’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). The obviousness analysis requires several threshold inquiries identified below.

A. Claims cannot be found obvious if an element is missing and expert testimony cannot supply the missing claim element

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 or suggest all claim limitations); *Garmin Int’l, Inc. v. Patent of Cuozzo Speed Techs. LLC*, No. IPR2012-00001, Paper 15 at 15 (P.T.A.B. Jan. 9, 2013) (refusing to institute an IPR under 35 U.S.C. § 103 where prior art did not disclose all claim limitations). Further,

Because an *inter partes* review may only be requested “on the basis of prior art consisting of patents or printed publications,” 35 U.S.C. § 311(b), expert testimony cannot take the place of disclosure from patents or printed publications. In other words, expert testimony may explain “patents and printed publications,” but is not a substitute for disclosure in a prior art reference itself.

See OFFICE PATENT TRIAL PRACTICE GUIDE at § I.G.

B. A petition must address the *Graham* factors

Obviousness is resolved on a number of 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 Petitions for IPR “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) (emphasis added). 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).

C. An IPR Petition Must Provide Articulated Reasons With Rational Underpinnings for How and Why the References Would Have Been Combined

The conclusion of obviousness based on a combination of references must be supported with explicit analysis of a reason to combine those references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The Federal Circuit has stated that such reasons must be 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 977, 988 (Fed. Cir. 2006); *accord Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008) (agreeing with the district court’s reasoning that “some kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented method”); *see also LG Elecs., Inc. v. Cellular Commc’ns Equip. LLC*, IPR2016-00197, Paper 7 at 7-11 (PTAB April 29, 2016) (faulting a petition’s obviousness analysis for lack of sufficient articulated reasons with rational underpinnings for modifying references to achieve particular elements required in the claims).

VI. THE PETITION DOES NOT DEMONSTRATE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE UNDER GROUND 1

For Ground 1, Petitioner contends that Djuric in view of AA renders claims 1-20 obvious. Petitioner fails at the threshold. Petitioner failed to show that a POSITA would have been motivated to combine AA with Djuric. Furthermore, Djuric and AA fail to disclose a number of limitations in independent claims 1, 13, and 20. Additionally, Petitioner does not address the *Graham* factors, including the requirements that Petitioner identify the differences between the challenged claims and Djuric and explain how such differences are allegedly overcome by AA. As set forth below, Petitioner's allegations do not satisfy Petitioner's threshold burden. Petitioner has thus failed to meet its burden as to Ground 1.

A. Petitioner failed to demonstrate that a POSITA would have been motivated to combine AA with Djuric

Petitioner improperly attempts to combine Djuric and AA for limitations 1[a], 1[a-i], 1[a-ii], 1[a-iii], 1[c], and 1[e] directed to the claimed “probabilistic neural network” and “feature vector” limitations.¹ The Petition identifies two separate and

¹ Patent Owner addresses independent claim 1 as to all Grounds because claim 1 is the independent claim that Petitioner focuses on for all Grounds. *See, e.g.*, Pet. at 23-29, 52-55. Patent Owner's arguments with respect to claim 1 apply to all challenged claims, including independent claims 13 and 20.

internally inconsistent motivations to combine Djuric and AA, one for the “probabilistic neural network” limitations and one for the “feature vector” limitation. The stated basis for a POSITA being motivated to combine Djuric and AA in the manner suggested is facially and legally deficient.

Relevant here, it is well-established law that a conclusion of obviousness may not be infected with hindsight. Indeed, “[c]ombining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.” *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999) (citing *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.”)).

Additionally, the conclusion of obviousness based on a combination of references must be supported with explicit analysis of a reason to combine those references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The Federal Circuit has stated that such reasons must be 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 977, 988 (Fed. Cir. 2006); *accord Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed.

Cir. 2008) (agreeing with the district court’s reasoning that “some kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented method”); *see also LG Elecs., Inc. v. Cellular Commc’ns Equip LLC*, Case No. IPR2016-00197, Paper 7 at 7–11 (P.T.A.B. April 29, 2016) (faulting a petition’s obviousness analysis for lack of sufficient articulated reasons with rational underpinnings for modifying references to achieve particular elements required in the claims).

i. Petitioner failed to demonstrate that a POSITA would have been motivated to combine AA with Djuric as to limitations regarding the “probabilistic neural network”

Turning to Petitioner’s flawed allegations, Petitioner’s assertions regarding the “probabilistic neural network” are found in its mapping of limitation 1[a]. Limitation 1[a] recites “training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising” Petitioner claims that both Djuric and AA disclose this element.

For Djuric, Petitioner alleges that: “Djuric discloses that its system uses ‘a model,’ which is trained by ‘supervised training techniques.’ Djuric’s trained model may be various types of ‘neural network[s],’ including a ‘Bayesian network[,]’ which is a type of probabilistic neural network (PNN) (*training a probabilistic*

neural network). The model is configured to perform a number of steps.” Pet. at 23-24 (citations omitted) (emphasis in original).

For AA, Petitioner alleges that: “To the extent not explicitly disclosed by Djuric, AA describes training a convolutional neural network, as a ‘trained probabilistic model,’ that ‘generates a probability distribution’ to ‘account for the uncertainty of plausible future poses in predicting subject motion.’ Thus, AA’s convolutional neural network that is trained as a probabilistic model is *a probabilistic neural network*.” *Id.* at 24 (citations omitted) (emphasis in original).

Setting aside the inaccuracies in Petitioner’s positions, which are discussed *infra*, what immediately follows these passages is an express admission that Petitioner is improperly using the ’579 patent as a roadmap to craft its obviousness allegations. Petitioner states:

AA’s teachings align with the ’579 Patent, which 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)."

Pet. at 24 (emphasis added). Petitioner’s motivations are fatally infected with impermissible hindsight bias, as the allegations themselves acknowledge using the

'579 patent as a roadmap. *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.”); *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.”). This admission is fatal to Petitioner’s obviousness assertion.

Petitioner’s allegations with respect to limitation 1[a] are also fundamentally flawed in other ways. As set forth above, Petitioner claims that both Djuric and AA disclose limitation 1[a]. *See* Pet. at 23-24. Petitioner’s assertions are similar to *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, in which the Federal Circuit held that there was no motivation to combine two references. 688 F.3d 1342, 1369 (Fed. Cir. 2012). There, the defendant proposed combining two wound-care patents to invalidate a patent related to treating a wound with negative pressure. One of those references disclosed “treating or healing of wounds,” and the other disclosed “a seal capable of maintaining negative pressure.” *Id.* The Court observed that “both of these references independently accomplish similar functions, namely, draining fluids.” *Id.* The Court held that, “[b]ecause each device independently operates effectively, a person having ordinary skill in the art, who was merely seeking to create a better device to drain fluids from a wound, would have no reason to combine

the features of both devices into a single device.” *Id.* The same is true here if Petitioner’s allegations are viewed as correct. Petitioner claims that both Djuric and AA disclose limitation 1[a]’s “probabilistic neural network.” Assuming arguendo this is correct, Petitioner’s allegations beg the question of why a POSITA looking at Djuric would be motivated to consult AA with respect to the requirement of a “probabilistic neural network.” Stated differently, if Petitioner’s allegations that both references disclose a “probabilistic neural network” are true, why would a POSITA looking at Djuric be motivated to seek other references for this limitation?

On this same point, Petitioner’s stated reason to combine Djuric and AA for the “probabilistic neural network” limitations is that “[a] POSITA would have recognized that implementing the probabilistic approach from AA would help Djuric ‘account for the uncertainty of future movements’ and ‘account for the uncertainty of plausible future poses in predicting subject motion... in real-time.’” Pet. at 20. But as to limitation 1[e], which recites in part “the navigation based on at least *the measure of uncertainty generated by the probabilistic neural network*” and limitation 1[d] “determining a measure of uncertainty ...,” Petitioner solely relies on Djuric’s model and does not even rely on AA for these limitation. *See* Pet. at 34-39. Remarkably, Petitioner does not even rely on AA for these “uncertainty” claim limitations that are related to the alleged reasons as to why a POSITA would be

motivated to combine AA with Djuric. Thus, Petitioner has failed to provide any rational underpinning for why a POSITA would be motivated to combine AA with Djuric based on AA's alleged benefits as to "uncertainty" issue, as Petitioner does not even rely on AA as to the "uncertainty" claim limitations.

Furthermore, Petitioner does not explain how Djuric's alleged disclosures of these limitations, such as Djuric's confidence level quantifying how likely an object is to follow a certain trajectory, are allegedly any different than the alleged disclosure of AA's "probabilistic approach" that "accounts for uncertainty of plausible future positions." In other words, Petitioner does not allege or show that Djuric lacks the very functionality it cites to in AA for the proposed motivation to combine. Again, if Djuric already possesses this functionality, why would a POSITA be motivated to consult AA? In short, they would not, which is fatal to Petitioner's argument.

Finally, for the "probabilistic neural network" limitations, Djuric itself teaches away from the proposed combination. Indeed, Petitioner readily acknowledges that "Djuric's stated goal [is] that 'the combined data set can allow the model's network to be smaller and, thus, use less computational resources (e.g., processing, storage, etc.)[.]'" Pet. at 21 (citing Ex. 1004 at ¶ 0037). But a probabilistic neural network is known to be computationally expensive and memory intensive. *See, e.g.*, <https://www.geeksforgeeks.org/deep-learning/probabilistic-neural-networks-pnns/>

(reciting limitations of a PNN, including “PNNs are computationally expensive . . .” and “PNNs can be memory intensive . . .”). Neither Petitioner nor its expert address how the proposed modification would be implemented, and whether it would thwart Djuric’s stated goal of computational efficiency. *See Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008) (“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.”) (quoting *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006); *see also, e.g., Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (finding no motivation to modify the prior art where doing so “would destroy the basic objective” of the prior art). Indeed, a POSITA would not be motivated to use a “probabilistic neural network” that would defeat the objectives of Djuric’s stated goal, as acknowledged by the Petitioner. Petitioner and its expert fail to grapple with these details.

For at least these reasons, Petitioner has failed to provide the requisite articulated reasoning with rational underpinning as to why a POSITA would have been motivated to combine AA with Djuric as to these claim limitations.

ii. Petitioner failed to demonstrate that a POSITA would have been motivated to combine AA with Djuric as to limitation 1[a-ii] regarding the “feature vector”

Element 1[a-ii] recites “[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.” For this element of Petitioner’s proposed Djuric-AA combination, Petitioner relies solely on AA. Pet. at 28. However, Petitioner’s proposed motivation to supplement Djuric with AA to satisfy this element is confusing and lacks the requisite specificity.

Djuric discloses a “combined data set” that “can include a plurality of images (e.g., rasterized images) associated with an object . . . Each image associated with the object can be associated with a point in time.” Ex. 1004 at ¶ 30; *see also id.* at ¶¶ 31-37. The combined data set can be specific to a particular object. *Id.* at ¶ 31. The combined data set is input into the machine-learned model. *Id.* The machine-learned model can analyze the combined data set to predict a path of the object....” *Id.* at ¶ 33. Petitioner’s description of Djuric is consistent with this explanation. Pet. at 17-18.

The proposed motivation to supplement Duric with AA for element 1[a-ii] is found on pages 21 and 22 of the Petition. There, Petitioner alleges that:

A POSITA would also implement AA’s “feature vector” stage to make Djuric’s model more effective. EX1003, ¶81. Using a compact feature-

vector representation after Djuric’s rasterized, multi-channel inputs would reduce spatial redundancy and thereby improve compute efficiency. EX1003, ¶81. This directly serves Djuric’s stated goal that “the combined data set can allow the model’s network to be smaller and, thus, use less computational resources (e.g., processing, storage, etc.).” EX1004, ¶0037. Implementation would also be straightforward. Djuric already “input[s] the combined data set into the machine-learned model” to predict trajectories of objects around the autonomous vehicle (EX1004, ¶0037), and it would be straightforward to use this data to generate a feature vector as taught by AA. EX1003, ¶81. Thus, this modification of Djuric would have been well within the skill of a POSITA, and a POSITA would have an expectation of success in the modification. EX1003, ¶81

Pet. at 21-22.

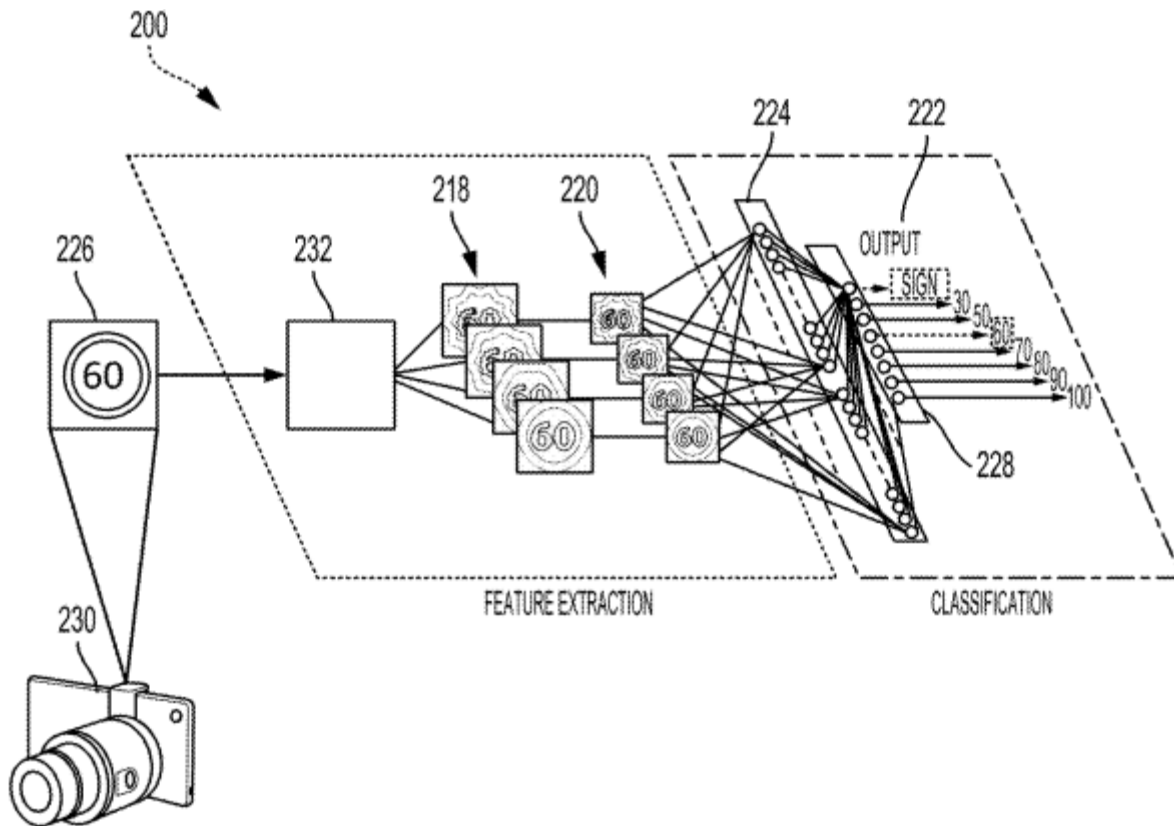
Petitioner’s allegations are completely unclear. Specifically, it is unclear as to what point in Djuric’s process Petitioner proposes to introduce AA’s “feature vector” – i.e., whether (1) Petitioner is proposing to represent the combined data set as a “feature vector,” which is then input into Djuric’s model, or (2) whether Petitioner is proposing to take the output of Djuric’s model and further convert it to a “feature vector.”

The confusion is caused by ambiguity in two sentences. First, Petitioner states that “[u]sing a compact feature-vector representation *after Djuric’s rasterized*,

multi-channel inputs would reduce spatial redundancy and thereby improve compute efficiency.” Pet. at 21 (emphasis added). Use “after Djuric’s rasterized, multi-channel inputs” is unclear and it cannot reasonably be determined from this sentence at what point in time Petitioner is proposing to use a “feature-vector representation.” Second, Petitioner alleges that “[i]mplementation would also be straightforward. Djuric already ‘input[s] the combined data set into the machine-learned model’ to predict trajectories of objects around the autonomous vehicle (EX1004, ¶0037), and it would be straightforward to use *this data* to generate a feature vector as taught by AA.” Pet. at 21 (emphasis added). When using “this data,” it is unclear if Petitioner is referring to the “combined data set” or the output of the machine-learned model, described by Petitioner as the “predict[ed] trajectories of objects around the autonomous vehicle.” Pet. at 21-22 (emphasis added). This lack of clarity alone requires denial. *See, e.g., Liberty Mut. Ins. Co. v. Progressive Cas. Ins. Co.*, CBM2012-00003, Paper 8 at 14-15 (Oct. 25, 2012) (representative) (“[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. . . . [I]t is the responsibility of the Petitioner to clearly articulate [the proposed combination].”).

To the extent Petitioner’s vague allegations propose converting Djuric’s combined data set to a feature vector, which would then be input to Djuric’s machine-learned model, the allegations fall far short of meeting Petitioner’s burden. While Petitioner claims that such a conversion would “reduce spatial redundancy and thereby improve compute efficiency,” it provides no explanation as to why this would be the case. Pet. at 21. Indeed, this proposed modification to Djuric would introduce extra processing into Djuric’s process – converting the combined data set into a feature vector, which would then serve as input to the model. This is contrary to, as opposed to consistent with, Djuric’s stated goal to “use less computational resources.” Pet. at 21 (citing Ex. 1004 at ¶ 0037). As explained in AA, this conversion step requires its own processing.

Indeed, AA describes generation of a feature vector with respect to Figure 2d:



As made clear by Figure 2, converting image 226 to a “feature vector” requires both “feature extraction” and “classification.” With respect to this Figure, AA discloses:

In the example of FIG. 2D, the second set of feature maps 220 is convolved to generate a first feature vector 224. Furthermore, the first feature vector 224 is further convolved to generate a second feature vector 228. Each feature of the second feature vector 228 may include a number that corresponds to a possible feature of the image 226, such as “sign,” “60,” and “100.” A softmax function (not shown) may convert the numbers in the second feature vector 228 to a probability. As such, an output 222 of the DCN 200 is a probability of the image 226 including one or more features.

Ex. 1005 at ¶ 37.

To the extent Petitioner’s vague allegations propose converting Djuric’s combined data set to a feature vector, Petitioner’s conclusory assertion that this conversion would further Djuric’s stated goal of “us[ing] less computational resources” is wholly unexplained and should be given no weight. The motivation to combined must include articulated reasoning with some rational underpinnings. *See, e.g., In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”); *see also Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008) (agreeing with the district court’s reasoning that “some kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented method”); *LG Elecs., Inc. v. Cellular Commc’ns Equip. LLC*, IPR2016-00197, Paper 7 at 7-11 (April 29, 2016) (faulting a petition’s obviousness analysis for lack of sufficient articulated reasons with rational underpinnings for modifying references to achieve particular elements required in the claims). Here Petitioner’s conclusory statement provides no such analysis or reasoning.

To the extent Petitioner’s vague allegations are proposing to convert Djuric’s machine-learned model’s output (predicted object trajectories) to a feature vector, this too is unexplained. Petitioner does not explain why this would be done or how this modification would “use less computational resources.” The requisite articulated reasoning with some rational underpinning is absent. *See id.*

Petitioner’s expert adds nothing to Petitioner’s allegations regarding a motivation to combine Djuric and AA for the “probabilistic neural network” and “feature vector” limitations. Instead, his declaration merely parrots the Petition. *Compare* Ex. 1003, ¶¶ 78-83 *with* Pet. at 20-23. As a result, the cited declaration testimony is conclusory and unsupported by any underlying facts or data. It adds nothing of substance to the assertions for which it is offered to support and is therefore entitled to little weight. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”); *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) (“Lack of factual support for expert opinion to factual determinations, however, may render the testimony of little probative value in a validity determination.”) (quoting *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985)); *Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986) (“Although in some circumstances

unsupported oral testimony can be sufficient to provide prior knowledge or use, it must be regarded with suspicion and subjected to close scrutiny.”).

For at least these reasons, Petitioner has failed to set forth a sufficient allegation for a POSITA being motivated to combine AA with Djuric for the “probabilistic neural network” and “feature vector” limitations found in limitations 1[a], 1[a-i], 1[a-ii], 1[a-iii], 1[c], and 1[e]. This defect is fatal to all Grounds.

B. Petitioner failed to demonstrate that Djuric or AA disclose or render obvious the “probabilistic neural network” limitations recited in the independent claims

Independent claim 1 recites multiple limitations directed to a “probabilistic neural network” (“PNN”).² For example, limitation 1[a] recites, in part, “training a probabilistic neural network.” The limitations reproduced below are also directed to the functionality of the recited “probabilistic neural network:”

- 1[a-i] “receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic;”

² Patent Owner addresses independent claim 1 as to all Grounds because claim 1 is the independent claim that Petitioner focuses on for all Grounds. *See, e.g.*, Pet. at 23-29, 52-55. Patent Owner’s arguments with respect to claim 1 apply to all challenged claims, including independent claims 13 and 20.

- 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[c] “executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;” and
- 1[e] “the navigation based on at least the measure of uncertainty generated by the probabilistic neural network.”

Petitioner alleges that both Djuric and AA disclose a PNN configured to perform the steps recited in these limitations. *See* Pet. at 23 (“Djuric and AA teach element 1[a].”); *id.* at 25 (“Djuric and AA teach element 1[a-i].”); *id.* at 29 (“Djuric and AA teach element 1[a-iii].”); *id.* at 34 (“Djuric and AA teach element 1[d].”); and *id.* at 36 (“Djuric and AA teach element 1[e].”) But as detailed below, Petitioner has failed to carry its burden of showing that Djuric or AA teach a PNN that is configured to perform the steps required by limitations 1[a-i], 1[a-iii], 1[c], or 1[e].

Petitioner first alleges that Djuric discloses a PNN. Petitioner’s entire analysis as to whether Djuric discloses limitation 1[a] is wholly reproduced below:

Djuric and AA teach element 1[a]. EX1003, ¶86. Djuric discloses that its system uses “a model,” which is trained by “supervised training techniques.” EX1004, ¶¶0027, 0053, 0132-0139. Djuric’s trained model may be various types of “neural network[s],” including a “Bayesian network[,]” which is a type of probabilistic neural network (PNN) (*training a probabilistic neural network*). EX1004, ¶¶0027, 0053, 0126, 0132; EX1003, ¶86.

Pet. at 23-24 (emphasis in original).

This analysis is insufficient. Petitioner’s assertion that Djuric uses “a model” trained by “supervised training techniques” does not address how or why that model constitutes a *probabilistic* neural network, as expressly required by limitation 1[a]. *See id.*

Nor does Petitioner’s assertion that Djuric’s model *may be* various types of neural networks satisfy the claim requirement. *Id.* Limitation 1[a] does not encompass just any neural network; it specifically requires a *probabilistic* neural network. Notably, Djuric never describes its model as probabilistic, nor does it use the word “probabilistic” anywhere in its disclosure. *See* Ex. 1004 at *passim*.

Petitioner attempts to bridge this gap by asserting, without explanation, that a Bayesian network “is a type of probabilistic neural network.” Pet. at 23-24. But

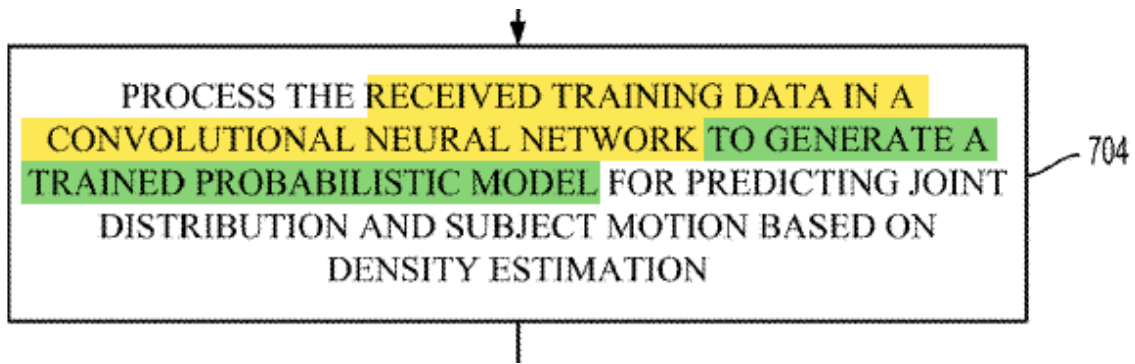
Petitioner does not address Djuric’s disclosure that listing Bayesian networks and neural networks as alternative types of models:

the machine-learned models 740 can be or can otherwise include various machine-learned models such as, for example, **neural networks** (e.g., deep neural networks), support vector machines, decision trees, ensemble models, k-nearest neighbors models, **Bayesian networks**, or other types of models including linear models and/or non-linear models. Example neural networks include feed-forward neural networks, recurrent neural networks (e.g., long short-term memory recurrent neural networks), or other forms of neural networks.

Ex. 1004 at [¶ 126] (emphasis added); *see also id.* at [¶ 127]. Indeed, Petitioner provides no analysis—technical or otherwise—to reconcile its blanket assertion that Djuric discloses a PNN with this disclosure from Djuric. Accordingly, Petitioner has failed to meet its burden of showing that Djuric discloses limitation 1[a].

Petitioner next alleges that AA discloses a PNN. Pet. at 24. Specifically, Petitioner asserts that AA “describes training a convolutional neural network, as a ‘trained probabilistic model.’” *Id.*

AA discloses a convolutional neural network (“CNN”) that “*generates* a trained probabilistic model.”



EX1005 at Fig. 7 (annotation added), ¶¶ 0005-0008, ¶ 0065. But Petitioner fails to explain how a neural network that generates or outputs a probabilistic model is itself a probabilistic neural network.

Further, even if AA disclosed a PNN, Petitioner has failed to meet its burden that such network is configured to perform the steps required by at least limitations 1[a-i], 1[a-iii], 1[c], and 1[e]. Although Petitioner asserts that AA teaches these limitations, it provides no citations to support those conclusory assertions. *See* Pet. at 25-31, 36-39.

As a result, the Petition fails to show that AA discloses a PNN configured to perform the steps recited in limitations 1[a-i], 1[a-iii], 1[c], and 1[e]. Nor does the Petition offer any explanation as to how a person of ordinary skill in the art would modify the distinct networks disclosed in Djuric and AA to arrive at a single PNN configured to perform those steps. Accordingly, Petitioner has failed to meet its burden with respect to these limitations.

As the Federal Circuit has made clear, “the Petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363. Consistent with this principle, the Board resolves vagueness and ambiguity in the Petitioner’s arguments against the Petitioner. *Liberty Mut. Ins.*, No. CBM2012-00003, Paper 8 at 14-15 (representative).

Given that Petitioner does not show with particularity that Djuric or AA disclose a “probabilistic neural network” configured to perform the steps recited in limitations 1[a-i], 1[a-iii], 1[c], and 1[e], Petitioner has failed to meet its burden that the challenged claims are obvious in light of Djuric or AA.

Petitioner also cites to its expert declaration in support of its arguments, but that declaration fares no better than the Petition itself. Rather than providing any further explanation, Petitioner’s expert merely parrots the language and citations from the Petition. *Compare* Ex. 1003, ¶¶ 86-87 *with* Pet. at 23-24 as to limitation 1[a]; *compare also* Ex. 1003, ¶¶ 88-89 *with* Pet. at 25-28 as to limitation 1[a-i]; *compare also* Ex. 1003, ¶¶ 90-91 *with* Pet. at 28-29 as to limitation 1[a-iii]; *compare also* Ex. 1003, ¶ 99 *with* Pet. at 33-34 as to limitation 1[c]; *compare also* Ex. 1003, ¶¶ 104-106 *with* Pet. at 36-39 as to limitation 1[e].

As a result, the cited declaration testimony is conclusory and unsupported by any underlying facts or data. It adds nothing of substance to the assertions for which

it is offered to support and is therefore entitled to little weight. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”); *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) (“Lack of factual support for expert opinion to factual determinations, however, may render the testimony of little probative value in a validity determination.”) (quoting *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985)); *Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986) (“Although in some circumstances unsupported oral testimony can be sufficient to provide prior knowledge or use, it must be regarded with suspicion and subjected to close scrutiny.”).

Furthermore, the Trial Practice Guide makes clear that “expert testimony cannot take the place of disclosure from patents or printed publications” and “is not a substitute for disclosure in a prior art reference itself.” *See* OFFICE PATENT TRIAL PRACTICE GUIDE at § I.G. Accordingly, Petitioner’s reliance on its expert declaration cannot remedy the Petition’s failure to identify where Djuric discloses the challenged limitations.

In sum, Petitioner has not met its burden of showing that Djuric or AA disclose or render obvious limitations 1[a-i], 1[a-iii], 1[c], or 1[e] reciting a “probabilistic neural network.”

Claim limitations 13[a], 13[a-i], 13[a-iii], 13[c], 13[e], 20[a], 20[a-i], 20[a-iii], 20[c], and 20[e] of independent claims 13 and 20 also require a “probabilistic neural network.” For the same reasons discussed above with respect to independent claim 1, Petitioner has not met its burden as to independent claims 13 or 20.

Further, Petitioner has wholly failed to provide any type of meaningful analysis as to these claim limitations. This failure is dispositive. As the Federal Circuit has explained, “the Petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363. IPR proceedings are party-directed and adversarial; the Board is not tasked with supplying missing arguments or evidence. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018) (“rather than create (another) agency-led, inquisitorial process for reconsidering patents, Congress opted for a party-directed, adversarial process”).

Consistent with these principles, the regulations and statute require a petition to include a detailed explanation of the evidence, material facts, and governing law, and to specify where each claim element is found in the prior art. 37 C.F.R. § 42.22(a)(2) (“Each petition . . . must include . . . a detailed explanation of the

significance of the evidence including material facts, and the governing law, rules, and precedent.”); 37 C.F.R. § 42.104(b)(4) (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”); 35 U.S.C. § 312(a)(3) (Petitioner bears the burden of identifying “in writing and with particularity . . . the evidence that supports the grounds for the challenge to each claim”). As the Board has repeatedly held, “[i]t is Petitioner’s responsibility to cite specific evidence to support its arguments, not the Board’s”—nor Patent Owner’s—“responsibility to piece together evidence or speculate as to Petitioner’s position.” *TCL Communication Technology Holdings Ltd. v. Dataquill Limited*, No. IPR2020-00746, Paper 21 at 22 (Sept. 18, 2020); *see also Whole Space Industries Ltd. v. Zipshade Industrial (B.V.I.) Corp.*, No. IPR2015-00488, Paper 14 at 18 (P.T.A.B. July 24, 2015) (citations omitted).

Indeed, as emphasized by the Federal Circuit, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). Because Petitioner has failed to satisfy its burden as to Ground 1, institution on the ground should be rejected.

C. The Petition does not address the *Graham* factors

As set forth in Section V.B, the Petition’s Ground 1 obviousness assertion 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 Ground 1 allegations fail to do so. *See Eizo Corp. v. Barco N.V.*, Case No. IPR2014-00358, Paper 11 at 29–30 (P.T.A.B. July 23, 2014) (citing *Graham*, 383 U.S. at 17–18). Here, Petitioner alleges that “to the extent not explicitly disclosed by Djuric, AA describes training a convolutional neural network, as a ‘a trained probabilistic model’” Pet. at 24. 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. *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.*, Case No. IPR2014-00243, Paper 6 at

18 (P.T.A.B. June 18, 2014); *eBay, Inc. v. Paid, Inc.*, Case No. CBM2014-00125, Paper 15 at 21 (P.T.A.B. Sept. 30, 2014).

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*. For at least these additional reasons, Petitioner has not shown a reasonable likelihood of prevailing on Ground 1.

VII. THE PETITION DOES NOT DEMONSTRATE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE UNDER GROUND 2

For Ground 2, Petitioner contends that Djuric in view of AA and Cox renders claims 1-20 obvious. As set forth above, for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine Djuric with AA, or that Djuric or AA disclose at least limitations 1[a], 1[a-i], 1[c], 1[e], 13[a], 13[a-i], 13[c], 13[e], 20[a], 20[a-i], 20[c], and 20[e]. *See* Sections VI.A and VI.B. For Ground 2, Petitioner does not make any additional allegations as to why a POSITA would be motivated to combine Djuric with AA. For Ground 2, Petitioner also does not make any allegations with respect to these limitations. Furthermore, the Petition does not address the *Graham* factors, including the requirement that Petitioner identify the

differences between the challenged claims and Djuric. Thus, Petitioner has not met its burden as to Ground 2.

A. Petitioner failed to demonstrate that a POSITA would be motivated to combine AA with Djuric with respect to the Djuric-AA-Cox combination

As set forth above, for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine AA with Djuric. *See* Section VI.A. For Ground 2, Petitioner does not make any additional allegations with respect to this issue. *See* Pet. at 57-60. Thus, for all the same reasons discussed in Section VI.A as to Ground 1, Petitioner has failed to meet its burden as to Ground 2.

B. Petitioner failed to demonstrate that Djuric, AA, or Cox disclose or render obvious the “probabilistic neural network” limitations of the independent claims

Limitations 1[a], 1[a-i], 1[c], 1[e], 13[a], 13[a-i], 13[c], 13[e], 20[a], 20[a-i], 20[c], and 20[e] recite limitations associated with the training and/or functionality of the claimed “probabilistic neural network.” As set forth above, for Ground 1, Petitioner has not shown that Djuric or AA disclose these limitations. *See* Section VI.B. For Ground 2, Petitioner does not make any additional allegations with respect to these limitations. *See* Pet. at 55-65. Thus, for all the same reasons discussed in Section VI.B as to Ground 1, Petitioner has failed to meet its burden as to Ground 2.

C. The Petition does not address the *Graham* factors

Even though petitions for IPR “must address the *Graham* factors,” Petitioner’s Ground 2 allegations fail to do so. *See Eizo Corp. v. Barco N.V.*, Case No. IPR2014-00358, Paper 11 at 29–30 (P.T.A.B. July 23, 2014) (citing *Graham*, 383 U.S. at 17–18). Here, Petitioner alleges that “[t]o the extent Djuric alone does not render obvious the use of human labeled data to generate values representing a likelihood of receiving a particular user response from a user presented with the image as recited in element 1[a-iii], the claimed operations are also disclosed by Cox.” Pet. at 55. 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. *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.*, Case No. IPR2014-00243, Paper 6 at

18 (P.T.A.B. June 18, 2014); *eBay, Inc. v. Paid, Inc.*, Case No. CBM2014-00125, Paper 15 at 21 (P.T.A.B. Sept. 30, 2014).

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*. For at least these additional reasons, Petitioner has not shown a reasonable likelihood of prevailing on Ground 2.

VIII. THE PETITION DOES NOT DEMONSTRATE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE UNDER GROUND 3 OR GROUND 4

For Grounds 3 and 4, Petitioner improperly conflates its allegations into a single section by contending that Djuric in view of AA and Rolfe (Ground 3) or Djuric in view AA, Cox, and Rolfe (Ground 4) renders dependent claims 3 and 15 obvious. *See* Pet. at 65-68. As set forth above for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine Djuric with AA, or that Djuric or AA disclose at least limitations 1[a], 1[a-i], 1[a-iii], 1[c], 1[e], 13[a], 13[a-i], 13[a-iii], 13[c], 13[e], 20[a], 20[a-i], 20[a-iii], 20[c], and 20[e]. *See* Sections VI.A and VI.B. For Grounds 3 and 4, Petitioner does not make any additional allegations as to why a POSITA would be motivated to combine Djuric with AA. For Grounds 3

and 4, Petitioner also does not make any allegations with respect to these limitations. Furthermore, the Petition does not address the *Graham* factors, including the requirement that Petitioner identify the differences between the challenged claims and Djuric.

A. Petitioner failed to demonstrate that a POSITA would be motivated to combine AA with Djuric with respect to the Djuric-AA-Rolfe combination of Ground 3 or the Djuric-AA-Cox-Rolfe combination of Ground 4

As set forth above, for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine AA with Djuric. *See* Section VI.A. For Grounds 3 and 4, Petitioner does not make any additional allegations with respect to this issue. *See* Pet. at 66-67. Thus, for all the same reasons discussed in Section VI.A as to Ground 1, Petitioner has failed to meet its burden as to Grounds 3 and 4.

B. Petitioner failed to demonstrate that the Djuric-AA-Rolfe combination of Ground 3 or the Djuric-AA-Cox-Rolfe combination of Ground 4 disclose or render obvious the independent claims

Limitations 1[a], 1[a-i], 1[a-iii], 1[c], 1[e], 13[a], 13[a-i], 13[a-iii], 13[c], 13[e], 20[a], 20[a-i], 20[a-iii], 20[c], and 20[e] recite limitations associated with the training and/or functionality of the claimed “probabilistic network.” As set forth above, for Ground 1, Petitioner has not shown that Djuric or AA disclose these limitations. *See* Section VI.B. For Grounds 3 and 4, Petitioner does not make any allegations with respect to these limitations. *See* Pet. at 65-68. Thus, for all the same

reasons discussed in Section VI.B as to Ground 1, Petitioner has failed to meet its burden as to Grounds 3 and 4.

C. The Petition does not address the *Graham* factors

Even though petitions for IPR “must address the *Graham* factors,” Petitioner’s allegations for Grounds 3 and 4 fail to do so. *See Eizo Corp. v. Barco N.V.*, Case No. IPR2014-00358, Paper 11 at 29–30 (P.T.A.B. July 23, 2014) (citing *Graham*, 383 U.S. at 17–18). Here, Petitioner alleges that “[t]o the extent Djuric alone does not render obvious dependent claims 3 and 15, Rolfe confirms that the recited use of an evidence lower bound (ELBO) is a well-known statistical technique.” Pet. at 65. 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. *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.*, Case No. IPR2014-00243, Paper 6 at

18 (P.T.A.B. June 18, 2014); *eBay, Inc. v. Paid, Inc.*, Case No. CBM2014-00125, Paper 15 at 21 (P.T.A.B. Sept. 30, 2014).

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*. For at least these additional reasons, Petitioner has not shown a reasonable likelihood of prevailing on Grounds 3 or 4.

IX. THE PETITION DOES NOT DEMONSTRATE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE UNDER GROUND 5 OR GROUND 6

For Grounds 5 and 6, Petitioner improperly conflates its allegations into a single section by contending that Djuric in view of AA and Ross (Ground 5) or Djuric in view AA, Cox, and Ross (Ground 6) renders dependent claims 7 and 9 obvious. *See* Pet. at 68-74. As set forth above, for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine Djuric with AA, or that Djuric or AA disclose at least limitations 1[a], 1[a-i], 1[a-iii], 1[c], 1[e], 13[a], 13[a-i], 13[a-iii], 13[c], 13[e], 20[a], 20[a-i], 20[a-iii], 20[c], and 20[e]. *See* Sections VI.A and VI.B. For Grounds 5 and 6, Petitioner does not make any additional allegations as to why a POSITA would be motivated to combine Djuric with AA. For Grounds 5

and 6, Petitioner also does not make any allegations with respect to these limitations. Furthermore, the Petition does not address the *Graham* factors, including the requirement that Petitioner identify the differences between the challenged claims and Djuric.

A. Petitioner failed to demonstrate that a POSITA would be motivated to combine AA with Djuric with respect to the Djuric-AA-Ross combination of Ground 5 or the Djuric-AA-Cox-Ross combination of Ground 6

As set forth above, for Ground 1, Petitioner has not shown that a POSITA would be motivated to combine AA with Djuric. *See* Section VI.A. For Grounds 5 and 6, Petitioner does not make any additional allegations with respect to this issue. *See* Pet. at 69-70. Thus, for all the same reasons discussed in Section VI.A as to Ground 1, Petitioner has failed to meet its burden as to Grounds 5 and 6.

B. Petitioner failed to demonstrate that the Djuric-AA-Ross combination of Ground 5 or the Djuric-AA-Cox-Ross combination of Ground 6 disclose or render obvious the independent claims

Limitations 1[a], 1[a-i], 1[a-iii], 1[c], 1[e], 13[a], 13[a-i], 13[a-iii], 13[c], 13[e], 20[a], 20[a-i], 20[a-iii], 20[c], and 20[e] recite limitations associated with the training and/or functionality of the claimed “probabilistic network.” As set forth above, for Ground 1, Petitioner has not shown that Djuric or AA disclose these limitations. *See* Section VI.B. For Grounds 5 and 6, Petitioner does not make any additional allegations with respect to these limitations. *See* Pet. at 70-74. Thus, for

all the same reasons discussed in Section VI.B as to Ground 1, Petitioner has failed to meet its burden as to Grounds 5 and 6.

C. The Petition does not address the *Graham* factors

Even though petitions for IPR “must address the *Graham* factors,” Petitioner’s allegations for Grounds 5 and 6 fail to do so. *See Eizo Corp. v. Barco N.V.*, Case No. IPR2014-00358, Paper 11 at 29–30 (P.T.A.B. July 23, 2014) (citing *Graham*, 383 U.S. at 17–18). Here, Petitioner alleges that “Djuric, AA, and Ross render obvious claim 7 for the same reasons discussed in Section X.A.9 (Ground 1, claim 7),” and “[t]o the extent Djuric-AA does not explicitly disclose the hidden context represents a state of mind, the combination of Djuric-AA and Ross renders this obvious.” Pet. at 71. Petitioner also alleges that “Djuric and Ross render obvious claim 9 for the same reasons discussed in Section X.A.11 (claim 9),” and “[t]o the extent Djuric-AA does not explicitly disclose the hidden context represents a degree of awareness of the autonomous vehicle by a user, the combination of Djuric-AA and Ross renders this obvious.” Pet. at 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. *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.*, Case No. IPR2014-00243, Paper 6 at 18 (P.T.A.B. June 18, 2014); *eBay, Inc. v. Paid, Inc.*, Case No. CBM2014-00125, Paper 15 at 21 (P.T.A.B. Sept. 30, 2014).

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*. For at least these additional reasons, Petitioner has not shown a reasonable likelihood of prevailing on Grounds 5 or 6.

X. THE CHALLENGED CLAIMS ARE ENTITLED TO PATENTABLE WEIGHT

The determination of whether a claim limitation is entitled to patentable weight under the printed matter doctrine comprises a two-part analysis as set forth in *In re DiStefano*, 808 F.3d 845, 848-851 (Fed. Cir. 2015). To be considered printed matter, the claim limitation in question “must be matter claimed for what it communicates.” *Id.* at 849. Furthermore, the claim limitation is printed matter “only

if it claims the content of information.” *Id.* at 848. “Only if the limitation in question is determined to be printed matter does one turn to the question of whether the printed matter nevertheless should be given patentable weight.” *Id.* at 850.

Printed matter is given patentable weight if the “claimed informational content has a functional or structural relationship to the substrate.” *Id.* 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, 1033 (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 has also stated that it “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. v. Angiodynamics, Inc.*, 979 F.3d 1372, 1381 (Fed. Cir. 2020).

As an initial matter, Petitioner improperly attempts to shift the burden to Patent Owner by stating that “[p]rinted matter is *only* entitled to patentable weight if it is functionally related to the substrate on which the information is present.” Pet.

at 76 (emphasis added). Petitioner relies on and misinterprets *In re Marco Guldenaar Holding B.V.*, which actually holds that “claim limitations directed to the content of information and lacking a requisite functional relationship are not entitled to patentable weight.” Pet. at 76 (citing to *In re Marco Guldenaar Holding B.V.*, 911 F.3d 1157, 1161 (Fed. Cir. 2018) (quoting *Praxair*, 890 F.3d at 1032)). However, it is Petitioner’s burden to establish that the claim limitations in question are not entitled to patentable weight. 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.”); *In re Lowry*, 32 F.3d 1579, 1584 (Fed. Cir. 1994) (“Even assuming, arguendo, that data objects and data structures are analogous to printed matter . . . the burden of establishing the absence of a novel, nonobvious functional relationship rests with the PTO.”)

Like Petitioner’s obviousness assertions, Petitioner’s allegations regarding printed matter are conclusory and lack any meaningful analysis as to the independent claims.³ Indeed, Petitioner has failed to meet its burden because Petitioner’s

³ For purposes of Patent Owner’s Preliminary Response, Patent Owner only addresses the limitations of the independent claims.

allegations lack a showing with any particularity that any limitation of the challenged claims is printed matter as a threshold issue. *See* Pet. at 74-76 (“Because the above limitations are defined by the information contained in various data elements, they are patent ineligible printed matter.”). For example, Petitioner does not allege which particular claim element is “matter claimed for what it communicates,” much less what is being communicated and to whom. *Id.*; *see In re DiStefano*, 808 F.3d at 848-49.

Additionally, Petitioner does not cite to any case law in which claim limitations similar to those at issue here were found to be printed matter. Petitioner relies on *C R Bard* as standing for the proposition that a patent cannot cover certain limitations of the challenged claims. Pet. at 76. But the limitations discussed in *C R Bard* are directed to humans that perform a medical procedure involving physical implants with identifiers physically printed on the physical object, not to claim limitations performed by a machine or a computer, or anything close to the substance of the challenged limitations at issue here. 979 F.3d at 1376-77, 1381-82. Nor would such a discussion be relevant in *C R Bard*, because there, unlike here, “the parties agree[d] that the asserted claims include printed matter,” a fact which Petitioner sweeps under the rug. *Id.* at 1381. The other cases Petitioner cites are similarly directed to limitations performed by humans that involve information actually

printed on a physical object that convey information to a human. *See Praxair*, 890 F.3d at 1028-29 (claims are performed by humans and “generally require supplying a medical provider with a cylinder of nitric oxide gas and providing the medical provider with certain prescribing information relating to the harmful effects of nitric oxide for certain patients”); *In re Marco Guldenaar Holding B.V.*, 911 F.3d at 1161 (claims directed to humans playing a dice game, where markings on dice convey information to a human).

The claim limitations at issue here are not printed matter and do not comprise matter claimed for what it communicates that merely conveys information. For example, the claims require “training a probabilistic neural network,” “receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic,” “executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image,” “determining a measure of uncertainty for each of the plurality of values,” “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,” and at least one probabilistic neural network to perform or be configured to perform the steps of “receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic,” “generating a

feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature,” “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,” and “generate output representing hidden context for at least a traffic entity displayed in the new image.” Patent Owner could not find any cases that discuss or analyze claim limitations like those at issue here in the printed matter context. If the claim limitations at issue here were printed matter, one would expect a plethora of court decisions discussing this issue.

Assuming *arguendo* that the claim limitations are deemed to be printed matter, Petitioner fails to meet its burden that the limitations are not owed any patentable weight. Pet. at 76. Again, Petitioner only relies on cases directed to steps performed by a human involving matter actually printed on a physical substrate (e.g., markings on dice and instructions for a health care worker). *Id.* Petitioner then relies on these cases to allege that limitations of the challenged claims “merely inform[] people of the claimed information” without further analysis or explanation as to how this allegation is related to the challenged claims. *Id.* This is insufficient and, in any case, not true with respect to the challenged claims.

Indeed, the Federal Circuit has found a functional relationship where the claim requires a human taking a specific medical action based on printed matter comprising instructions related to the medical action because the interrelated claim information creates a functional relationship with a concrete step of discontinuing treatment because of that information. *See Praxair*, 890 F.3d at 1035. Similarly, the claims of the '579 patent interrelate information with concrete steps based on the alleged printed matter information. For example, receiving an image displaying a traffic entity, generating a feature vector comprising values describing statistical distribution for each feature, generating output representing hidden context for the entity where the output comprises a plurality of values representing a likelihood of receiving a particular user response from a user presented with the image, receiving a new image captured by an autonomous vehicle, executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image, determining a measure of uncertainty for each of the plurality of values, and navigating the autonomous vehicle to avoid the traffic entity displayed in the new image where the navigation is based on at least the measure of uncertainty generated by the by the probabilistic neural network. *See* Ex. 1001, claims 1, 13, and 20. Concrete steps such as “generating a feature vector,” “generating output representing hidden context for the traffic entity,” “determining

a measure of uncertainty for each of the plurality of values,” and “navigating the autonomous vehicle to avoid the traffic entity displayed in the new image ... based on at least the measure of uncertainty generated by the probabilistic neural network” are analogous to the concrete step of “discontinuing treatment.” *See Praxair*, 890 F.3d at 1035; *see also* Ex. 1001, claims 1, 13, and 20. The concrete steps of each challenged claim are interrelated with the alleged printed matter limitations, and the concrete steps are taken based on the alleged printed matter limitations.

Petitioner conclusorily alleges that limitations of the challenged claims “merely inform[] people of the claimed information,” without further analysis or explanation. Pet. at 76. For example, what “people” are merely being informed, when the independent claims recite steps performed by one or more computers and/or probabilistic neural networks. The Federal Circuit has provided that it “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*, 979 F.3d at 1381. The challenged claims do not “merely inform” people of the claimed information. Instead, while the challenged claims refer to certain types of data, they recite numerous limitations that interact to cause

specific actions in a claimed process, as previously discussed. For example, claim 1 of the '579 patent recites:

training a probabilistic neural network, 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,

generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, 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;

receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;

executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;

determining a measure of uncertainty for each of the plurality of values; and

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.

Ex. 1001, claim 1. The limitations also “create a new functionality in a claimed device” regarding the claimed “autonomous vehicle” that can now “navigate[] ... 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” based on the recited limitations. *C R Bard*, 979 F.3d at 1381.

Although Petitioner claims the alleged “printed matter limitations do not have any such functional relationship with the ‘substrate,’ which in this case is computer memory” (Pet. at 76), there is no basis for Petitioner’s conclusion that the substrate is simply “computer memory.” Rather, “substrate . . . encompasses the structural elements of the claimed invention.” *C R Bard*, 979 F.3d at 1381. The structural elements of the claimed inventions include elements such as autonomous vehicles, probabilistic neural networks, computers, memory comprising software instructions, processors, etc. As previously discussed, each of the challenged limitations has a functional relationship with such structural elements. For example, a functional relationship to a substrate has been found when software causes information to be displayed on a computer screen. *See Hafeman v. LG Elecs., Inc.*, Civil Action No. 6:21-cv-00696-ADA-DTG, 2023 U.S. Dist. LEXIS 66459, at *23 (W.D. Tex. Apr. 17, 2023). This is analogous to the claims at issue here, in which software causes, for example, a computer processor to perform one or more of the challenged limitations that ultimately lead to navigating the autonomous vehicle to avoid the traffic entity based on at least the measure of uncertainty.

In sum, the challenged claim limitations do not comprise printed matter. Even if they did, the printed matter is still owed patentable weight. Petitioner has failed to meet its burden to hold otherwise.

XI. PATENT OWNER’S FINAL COMMENTS

Patent Owner does not concede the legitimacy of any arguments in the Petition that are not specifically addressed herein and expressly reserves the right to rebut any such arguments in its Patent Owner Response if *inter partes* review is instituted. Similarly, Patent Owner also does not concede any underlying contentions in the Petition and reserves the right to rebut them later. Additionally, Patent Owner is not limited to the arguments presented here in this Preliminary Response, but expressly reserves the right to raise further arguments, including claim construction arguments, not presented in this Preliminary Response.

XII. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board decline to institute *inter partes* review of the ’579 patent.

Dated: January 16, 2026

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Preliminary Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 12,448 words, excluding the parts of this Patent Owner's Preliminary 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 Preliminary Response.

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Patent Owner's Preliminary Response was served on January 16, 2026, to Lead and Back-up Counsel for Petitioner at the service address provided in Petitioner's Mandatory Notices:

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