

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner,

v.

PERCEPTIVE AUTOMATA LLC

Patent Owner.

Case No. IPR2025-01573

Patent No. 10,614,344

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

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2037	District Court Statistics on Post-Institution Motions to Stay Pending IPR
2038	District Court Time-to-Trial Statistics
2039	Declaration of Eli Saber, Ph.D.
2040	CV of Eli Saber, Ph.D.
2041	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
2042	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, doi: 10.1109/IVS.2017.7995919
2043	Deposition of Dr. Jason Janét

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.120, Patent Owner Perceptive Automata LLC (“Perceptive”) submits this Response to the Petition for *Inter Partes* Review (“Petition”) filed by Tesla, Inc. (“Petitioner” or “Tesla”) challenging claims 1-22 of U.S. Patent No. 10,614,344 (the “’344 patent”) (Ex. 1001).

The Petition presents three grounds of obviousness, two based on multiple references (one combining U.S. Patent No. 10,496,091 (“Ross”) (Ex. 1004) and International Publication No. WO2014/210334 (“Cox”) (Ex. 1005) and one combining Ross, Cox, and U.S. Patent No. 10,733,506 (“Ogale”)) and one based on a single reference (U.S. Patent Application Publication No. 2019/0072966 (“Zhang”)) (Ex. 1006)).

Tesla’s three grounds suffer from critical flaws that render the challenged claims not unpatentable. First, each ground fails to teach two similar claim limitations—specifically, “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users” and “generat[ing] a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users.” Tesla and its expert (Dr. Janét) allege that these elements are met by Ross’s “set of possible intents . . . and associated likelihood values” and Zhang’s

predicted trajectories of objects. But nothing in the Petition, or in Ross or Zhang, supports that either of these is “statistical summary [data] characterizing a distribution of user responses expected to be received responsive to presenting the sensor data” to users. And nothing in Tesla’s attempt to combine Ross with Cox (or Ross with Cox and Ogale) changes that result.

Tesla’s obviousness grounds are further flawed in that there is no motivation to combine Ross and Cox (with or without Ogale). Cox discloses processes whose primary aim is to improve machine learning models for recognizing faces in images—something wholly divorced from the machine learning systems of Ross, Ogale, and the challenged claims. Nowhere does Tesla or its expert account for this difference in their obviousness analysis or explain why a POSITA would have been motivated to combine Cox with Ross and Ogale despite this difference.

Finally, the Petition’s single-reference obviousness ground fails because Zhang does not disclose or suggest two claim elements, and because Tesla failed to identify the differences between Zhang and the challenged claims, which *Graham* expressly requires Tesla and its expert to do.

Given these and other flaws in Tesla’s obviousness theories, the Board should conclude that challenged claims 1-22 of the ’344 patent are not unpatentable.

II. THE '344 PATENT AND THE CHALLENGED CLAIMS

A. Overview of the '344 Patent

The '344 patent issued on April 7, 2020, from U.S. Patent Application No. 16/512,560, filed July 16, 2019. *See* Ex. 1001. The '344 patent is a continuation of U.S. Patent Application No. 15/830,549, filed on December 4, 2017, and claims priority to U.S. Provisional Patent Application No. 62/528,771, filed July 5, 2017.¹

The '344 patent identifies and describes certain problems with autonomously operating a car. As the '344 patent states, “[t]he ability a driver of a car to look at a person—who is walking, driving another car, or riding a bike on or near a street—and predict what that person wants to do may be the single most important part of urban driving.” '344 patent, 1:21-24. “For example, when a driver of a car sees people near the car, determining whether one person will cross the street, whether another person will remain standing on a street corner, and whether yet another person will change lanes on his or her bicycle is necessary to safely drive the car and

¹ As Tesla notes, the provisional application to which the '344 patent claims priority predates the priority date of Zhang. Pet. 10. For the limited purpose of this proceeding, Patent Owner does not dispute that the references discussed in the Petition (Ross, Cox, Ogale, and Zhang) are prior art to the '344 patent.

avoid hitting the people.” *Id.* at 1:24-29. “This ability is so fundamental, that operating in cities without it would be nearly impossible.” *Id.* at 1:30-31.

The ’344 patent describes certain pre-existing methods that fail to adequately address these shortcomings of autonomous vehicles, including that “autonomous driving vehicles may rely on methods that make decisions on how to control the vehicles by predicting ‘motion vectors’ of people near the vehicles.” *Id.* at 1:38-40. As the ’344 patent indicates, the conventional methods accomplished this “by collecting data of a person’s current and past movements, determining a motion vector of the person at a current time based on these movements, and extrapolating a future motion vector representing the person’s predicted motion at a future time based on the current motion vector.” *Id.* at 1:41-46. The ’344 patent recognizes, “[h]owever, the [conventional] methods do not predict a person’s actions or movements based on other observations besides his or her current and past movements, which lead to inferior results in predicting the person’s future behavior.” *Id.* at 1:46-49.

The ’344 patent specifically describes and claims novel methods, non-transitory computer readable storage media, and systems which address the shortcomings of then-existing autonomous vehicle systems. For example, the ’344 patent discloses an embodiment where summary statistics of user responses can be used to train a learning based model so that the learning based model can predict

whether an object in the road (e.g., pedestrian) in an image has a given “state of mind—e.g. that a pedestrian is likely to cross the street or that an oncoming vehicle is unlikely to be willing to yield to the vehicle containing the sensor if the vehicle containing the sensor needs to turn.” *Id.* at 10:19-38; *see also id.*, 6:37-7:19, 11:5-12:20. “The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the ‘live data’ would do based on the summary statistics and/or training labels” *Id.* at 7:20-23; *see also id.*, 12:21-13:48. “The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind.” *Id.* at 7:32-39.

For example, claim 1 of the ’344 patent recites “[a] computer-implemented method comprising” the steps of “receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road” and “providing the sensor data as input to a supervised learning based model.”

As claim 1 further explains, “the supervised learning based model [is] configured to” perform certain functions, *i.e.*, “receive an input sensor data displaying a particular object on a road” and “predict[] an output statistical summary

characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object.” For example, given an image of a pedestrian at an intersection an autonomous vehicle is approaching, an embodiment of the claimed model is configured to predict an output statistical summary characterizing a distribution of what users expect the pedestrian will do (*e.g.*, enter the crosswalk in front of the vehicle, or wait until the vehicle passes).

Claim 1 further provides for “executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users,” and “controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data.”

B. Claim Overview

Independent claims 1, 10, and 19 are reproduced below:

Claim 1	Limitations
1[pre]	A computer-implemented method comprising:
1[a]	receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road;

1[b]	providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object;
1[c]	executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users; and
1[d]	controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data.
Claim 10	Limitations
10[pre]	A non-transitory computer readable storage medium storing instructions that when executed by one or more processors, cause the one or more processors to perform the steps comprising:
10[a]	receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road;
10[b]	providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object;
10[c]	executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the

	sensor data captured by the sensor installed on the autonomous vehicle to users; and
10[d]	controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data.
Claim 19	Limitations
19[pre]	A computing system comprising: one or more processors; and a non-transitory computer readable storage medium, storing instructions that when executed by the one or more processors, cause the one or more processors to perform steps comprising:
19[a]	receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road;
19[b]	providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object;
19[c]	executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users; and
19[d]	controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data.

III. LEVEL OF ORDINARY SKILL

Tesla alleges that a POSITA in the field of the '344 patent “would have had at least: (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, or equivalent course work, with three years of work experience in computer vision, autonomous vehicles, 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. 17. Neither Perceptive nor its expert (Dr. Saber) dispute this definition for purposes of resolving this IPR proceeding. Ex. 2039, ¶ 53.

Notably, Tesla does not allege that its expert (Dr. Janét) meets this definition, nor does Dr. Janét opine that he does. *See generally* 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 July 2017 timeframe. Ex. 2039, ¶ 53.

IV. CLAIM CONSTRUCTION

Petitioner alleges that “there is no need for claim construction” in this proceeding. Pet. 17. Patent Owner submits that the Board need not construe any claim terms in a particular manner to conclude that the challenged claims are not unpatentable. *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’”).

V. 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 (P.T.A.B. 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 or suggest 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 also *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006) (“[R]ejections 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 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 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).

VI. THE CHALLENGED CLAIMS ARE NOT UNPATENTABLE UNDER GROUND 1

For Ground 1, Tesla alleges that Ross in view of Cox renders claims 1-22 obvious. *See* Pet. 18-47. But Ross and Cox fail to disclose certain limitations of independent claims 1, 10, and 19, and Tesla provides no meaningful explanation of how it would have been obvious to modify these references to add those missing limitations. In addition, Tesla’s proposed motivation to combine Ross and Cox is fundamentally flawed, and Tesla has not properly considered the *Graham* factors in its obviousness allegations. The Board should therefore find the challenged claims not unpatentable under Ground 1.

A. Ross and Cox Do Not Teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users” (Elements 1[b], 10[b], and 19[b])

Limitation [b] of each independent claim recites in-part “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object.”² Tesla acknowledges that Ross fails to teach, suggest, or disclose “a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” *See* Pet. at 31-33. Indeed, as the Petition points out, Ross at best discloses the use of a “perception system” to generate data that an “intent model” uses to generate a “set of possible intents or hypotheses identifying possible next actions (and predicted trajectories), a given point in time when the action is likely to occur, and associated likelihood values.” Pet. 26, 28, 30. As Tesla implicitly acknowledges, Ross does not disclose how the “set of possible intents or hypotheses” or “associated likelihood values” are generated or what form they take. *See id.* at 30-31. Nor has Tesla addressed the claim language requiring that the summary “characterize[e] . . . user responses expected to be received responsive to presenting the sensor data to a plurality of users.” Thus,

² Patent Owner addresses claim 1 as to all Grounds because claim 1 is the independent claim that Tesla focuses on for all Grounds. *See* Pet. at 24-37, 44, 46.

Petitioner has not alleged (nor could it) that Ross teaches that its intent model satisfies the claim language “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users,” as required by the ’344 patent’s independent claims.

Despite not expressly acknowledging this difference between Ross and the challenged claims (a fatal flaw in the Petition, *see* Section VI.D), the Petition attempts to fill this gap by alleging two different theories. Each one is flawed.

First, Tesla alleges that, in view of Cox, “the Ross predicted data . . . is consistent with the decisions of human annotators during training and thus reflects the distribution of the various human annotator responses received from human annotators.” Pet. 32. Tesla alleges this is the case because Cox’s model “make[s] predictions . . . that are more consistent with the decisions of the human annotators.” *Id.* at 31 (citing Ex. 1005, [0032]). But being “consistent with” such decisions does not equate to “predicting an output statistical summary characterizing a distribution of user responses expected to be received.” Ex. 2039, ¶¶ 78-79. The Petition offers nothing more than a conclusory assertion on this point, which is insufficient to meet their burden of proof. *See, e.g., Harmonic*, 815 F.3d at 1363 (“[T]he Petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”).

Second, Tesla alleges that “as applied to Ross, Cox teaches model training that would have included comparing Ross’s predictions to the human labeled training data to identify prediction errors and optimizing the Ross-Cox model such that the errors are minimized.” Pet. 33. However, nothing in the Petition explains how these basic training aspects somehow teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received,” as required by the independent challenged claims. *See id.*; Ex. 2039, ¶ 80. Such conclusory assertions cannot meet Tesla’s burden of proof. *See, e.g., Harmonic*, 815 F.3d at 1363.

As to both arguments, Dr. Janét’s declaration adds nothing, merely parroting the language of the Petition. *Compare* Ex. 1003, ¶¶ 96-102 *with* Pet. 30-33. The Board should thus give Dr. Janét’s testimony little to no weight. *See also Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, at 15, 19 (P.T.A.B. Aug. 24, 2022); *Kinetic Techs., Inc. v. Skyworks Sols., Inc.*, IPR2014-00529, Paper 8 at 14-15 (P.T.A.B. Sept. 23, 2014); *see also* 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*, 225 F.3d at 1311 (“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)).

For the foregoing reasons, Tesla has not shown that Ross and Cox teach or suggest “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users,” as required by independent claims 1, 10, and 19.

B. Ross and Cox Do Not Teach “executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users” (Elements 1[c], 10[c], and 19[c])

Element [c] of independent claims 1, 10, and 19 likewise requires “generat[ing] a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” For these limitations, the Petition simply refers back to its discussion of element 1[b]. Pet. at 34-35. As discussed above with respect to element [b], the combination of Ross and Cox does not teach “generat[ing] a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users” under either conclusory theory in the Petition, and Dr. Janét’s declaration does not add anything to the analysis. Thus, Tesla has failed to show that Ross and Cox teach element [c] of the independent claims for the same reasons discussed above. Ex. 2039, ¶ 85.

C. Challenged Dependent Claims

As discussed above, Ross and Cox do not teach or suggest elements of claims 1, 10, and 19. Each of the remaining challenged claims in Ground 1 depend from one of those independent claims, and Ross and Cox do not render them obvious for the same reasons.

D. A POSITA Would Not Have Been Motivated to Combine Ross and Cox in the Manner Tesla Alleges

The Petition alleges that “Ross alone renders obvious most limitations of the Challenged Claims.” Pet. 18. The Petition alleges that a POSITA would have been motivated to combine Ross with Cox “to render obvious the remaining limitations, which relate to a supervised learning model and predicting outputs that reflect ‘user responses expected to be received.’” *Id.* According to Tesla:

A POSITA would have been motivated to combine Ross and Cox such that Ross’s intent model is a supervised learning model that is trained with human annotated image data, as taught by Cox Based on this training approach, a POSITA would have further configured the Ross-Cox model to generate predictions for objects shown in camera data that are “more consistent with the decisions of the human annotators” who annotated the training data.

Pet. 20-21. However, neither assertion by Tesla provides a valid motivation to combine Ross with Cox.

Tesla's first assertion (i.e., that a POSITA would have been motivated to combine Ross with Cox "such that Ross's intent model is a supervised learning model that is trained with human annotated image data, as taught by Cox") is not a valid motivation to combine. *See* Pet. 20. Ross describes its own training process for its model:

[T]o train a model to generate likelihoods for these intents, rather than using a fixed time horizon and observing what the object does during that fixed time horizon, the training data may look as far into the future as it takes for the road user to perform any action included in the list of predetermined actions. Then, the next action included in the predetermined list of actions that the road user ends up performing is marked as the correct intent from the object's original position (when the intent would be determined).

Ex. 1004, 4:51-59; *see also id.*, 9:66-10:10. Ross's disclosure does not make clear whether this marking of the action is performed by a human annotator or by the system. *See id.*; Ex. 2039, ¶¶ 94-95. In either case, there would have been no motivation for a POSITA to have modified Ross in view of Cox to either replace this training with Cox's human annotated training data or modify it in view of Cox's training process. *Id.* If Ross's marking is performed by a human annotator, a POSITA would not have been motivated to combine Ross with Cox to implement human annotated training data because Ross already teaches that. *Id.*, ¶ 96. And, if Ross's markings are performed by the system instead of a human, a POSITA still

would not have been motivated to combine Ross with Cox because Ross’s training data “may look as far into the future as it takes for the road user to perform any action included in the list of predetermined actions.” Ex. 1004, 4:54-56; Ex. 2039, ¶ 97. Because of this, a POSITA would not have been motivated to substitute the certainty of that marking with an annotator’s prediction as described in Cox. *Id.*

Additionally, under either theory, Tesla’s theory amounts to “modifying” Ross to add a feature (Cox’s annotated training data) already present in Ross’s system. This situation is 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. Ross and Cox independently accomplish similar functions, i.e., training their models to reduce prediction errors using annotated/marked training

data. *See* Ex. 1004, 4:51-59; Ex. 1005, [0007]-[0010]. Thus, a POSITA would not have been motivated to combine Ross and Cox into the so-called “Ross-Cox model” as Tesla alleges.

Tesla’s second assertion (i.e., that “a POSITA would have further configured the Ross-Cox model to generate predictions for objects shown in camera data that are ‘more consistent with the decisions of the human annotators’ who annotated the training data”) is also not a valid motivation to combine. *See* Pet. 20-21. For starters, Tesla does not even explain what this “further configur[ation]” would entail, and Tesla does not suggest any modifications to Ross as part of this alleged motivation to combine. *See id.* As such, Tesla has failed to establish its obviousness combination with the requisite articulated reasoning with rational underpinning. *See In re Kahn*, 441 F. 3d at 988. Moreover, as Dr. Saber explains, “a POSITA would have known that the purpose of using annotated training data to train Ross’s model (or any machine learning model) is to make the model’s predictions consistent with the annotations in the training data.” Ex. 2039, ¶ 97. Tesla’s assertion is thus not a valid motivation to combine.

Setting aside Tesla’s invalid assertions, a POSITA would not have been motivated to combine Ross with Cox for additional reasons. Ross and Cox are directed to fundamentally different types of machine learning systems with distinct aims. Ross’s system observes the behavior of road users over time (including

looking into the future in a scenario to see what the road user actually does) and uses that information to train a machine learning model to predict what such road users will do. *See, e.g.*, Ex. 1004, 4:25-32, 4:51-65. In contrast, Cox is generally concerned with improving the ability of a machine learning model to predict classifications of images—primarily whether a face is or is not present in an image, but also tangentially with other questions such as the gender of the subject in the image or an emotion conveyed by a face in the image. *See* Ex. 1005, [0007]-[0010], [0016]. As Dr. Saber explains in detail, these different systems and aims affect the design of the network architecture, selection of an appropriate loss function, and other features of the system, such that Tesla’s alleged combination of Ross and Cox amounts to nothing more than an attempt to engage in hindsight reconstruction of the claimed invention. Ex. 2039, ¶¶ 98-101; *see also* Ex. 2041 at 1 (noting that “pedestrian path prediction is a challenging problem, due to the highly dynamic nature of pedestrian motion, and systems need to react with limited computation time”), Ex. 2042 at 1 (noting that “the ability to infer the future intentions of drivers to predict the likelihood of potential collisions” “is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents”).

Tesla’s expert declaration adds nothing to the motivation to combine analysis, merely parroting the Petition. As such, it should be given little to no weight. *See*,

e.g., *Xerox*, Paper 9 at 15, 19; *Kinetic Techs.*, Paper 8 at 14-15; *see also TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019) (“[A] conclusory assertion with no explanation is inadequate to support a finding that there would have been a motivation to combine.”); *In re Kahn*, 441 F.3d at 988 (requiring “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

In sum, Tesla’s combination of Ross and Cox is fundamentally flawed. The Board should find the challenged claims not unpatentable under Ground 1.

VII. THE CHALLENGED CLAIMS ARE NOT UNPATENTABLE UNDER GROUND 2

For Ground 2, Tesla alleges that Ross in view of Cox and Ogale renders claims 1-22 obvious. *See* Pet. 47-56. Just as with Ground 1, however, Ross and Cox fail to disclose certain limitations in independent claims 1, 10, and 19, and Tesla’s addition of Ogale to the combination does not cure these shortcomings. In addition, Tesla’s proposed motivation to combine Ross and Cox is just as fundamentally flawed as it is for Ground 1, and the addition of Ogale only creates further flaws. Further, Tesla has not properly considered the *Graham* factors in its obviousness allegations. The Board should therefore find the challenged claims not unpatentable under Ground 2.

A. Ross, Cox, and Ogale Do Not Teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users” (Elements 1[b], 10[b], and 19[b])

Tesla alleges that Ross and Cox teach element [b] of each independent claim for the same reasons it alleges for Ground 1. *See* Pet. 52. However, Tesla adds Ogale to Ross and Cox in its Ground 2 combination “to the extent that the Patent Owner argues, or the Board finds, that the predictions generated by the Ross-Cox model do not correspond to (1) user responses expected to be received responsive to presenting the sensor data to a plurality of users or (2) user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users.” Pet. 47.

As discussed in Section VI.A above, Ross and Cox do not teach element [b] of the challenged independent claims because this combination does not disclose or suggest the claim element “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” Ogale does not cure the deficiency for which it was added, namely Ross and Cox’s failure to disclose “user responses expected to be received responsive to presenting the sensor data.” Pet. 47; *see* Ex. 2039, ¶¶ 110-111.

Indeed, Tesla’s scant and conclusory allegations for element 1[b] merely allege that (1) Ogale “describes that its prediction model for an autonomous vehicle

that is trained using human labeled training data and in particular, labeled training data provided by multiple human participants” and (2) that “[b]y training Ogale’s model with such human labeled data, the model outputs predictions based on input sensor data that predicts how a human would have labeled the input sensor data.” Pet at 52 (citations omitted). Nothing in these allegations even claims, much less establishes, that Ogale cures Ross and Cox’s failure to disclose “an output statistical summary characterizing *a distribution of user responses expected to be received*.” This missing element is not specifically addressed in Tesla’s allegations for element 1[b]. Accordingly, Tesla has failed to show that Ogale cures the deficiencies for which it was brought into the Ground 2 combination.

Tesla’s expert declaration again adds nothing to the obviousness analysis here, merely parroting the language of the Petition. *Compare* Ex. 1003, ¶¶ 149-152 with Pet. 51-53. The Board should thus give Dr. Janét’s opinions little to no weight. *See, e.g., Xerox*, Paper 9, at 15, 19; *Kinetic Techs*, Paper 8 at 14-15; *see also* 37 C.F.R. § 42.65(a); *Upjohn*, 225 F.3d at 1311.

The combination of Ross, Cox, and Ogale therefore fails to teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users,” as required by independent claims 1, 10, and 19.

B. Ross, Cox, and Ogale Do Not Teach “executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users” (Elements 1[c], 10[c], and 19[c])

Element [c] of independent claims 1, 10, and 19 requires “generat[ing] a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” For this element, the Petition simply refers back to its discussion of element 1[b]. Pet. 53-56. For the same reasons discussed in Section VII.A above with respect to element 1[b], Tesla failed to show that Ross, Cox, and Ogale teach “generat[ing] a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” Ex. 2039, ¶ 115.

C. Challenged Dependent Claims

As discussed above, Ross, Cox, and Ogale do not teach or suggest elements of claims 1, 10, and 19. Each of the remaining challenged claims in Ground 2 depend from one of those independent claims, and Ross, Cox, and Ogale do not render them obvious for the same reasons.

D. A POSITA Would Not Have Been Motivated to Combine Ross, Cox, and Ogale in the Manner Tesla Alleges

According to the Petition, Ground 2 merely adds Ogale to Petitioner’s proposed combination “to the extent that the Patent Owner argues, or the Board

finds, that the predictions generated by the Ross-Cox model do not correspond to (1) user responses expected to be received responsive to presenting the sensor data to a plurality of users or (2) user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users.” Pet. 48. And, as the Petition expressly alleges, Tesla is only attempting to add Ogale to its proposed combination of Ross and Cox because Ogale allegedly “makes clear through its disclosure that human annotated training data used to train a predictive model provides that trained model outputs reflect how human annotators would have annotated the input data.” Pet. 53.

As discussed in Section VI.D above, a POSITA would not have been motivated to combine Ross and Cox in the manner Petitioner suggests, nor has Petitioner provided any articulated reasoning with rational underpinnings for why a POSITA would have done so or how such a combination would have yielded the claimed inventions. Tesla’s addition of Ogale to the proposed combination does not cure the lack of a motivation to combine Ross and Cox in the first place, and thus its alleged motivation to combine Ross and Cox for purposes of Ground 2 is deficient for the same reasons set forth in Ground 1. *See* Section VI.D above; *see* Ex. 2039, ¶¶ 119-123.

Here again, Petitioner’s expert declaration does not add anything to the obviousness analysis, instead just parroting the language from the Petition. *Compare*

Ex. 1003, ¶¶143-146 *with* Pet. 48-51. The Board should thus give Dr. Janét’s testimony little to no weight. *See, e.g., Xerox*, Paper 9 at 15, 19; *Kinetic Techs*, Paper 8 at 14-15; *TQ Delta*, 942 F.3d at 1359; *In re Kahn*, 441 F.3d at 988.

Because Tesla has failed to show a valid motivation to combine these references, the Board should find the challenged claims not unpatentable under Ground 2.

E. Tesla Fails to Consider the *Graham* Factors

Even though petitions for IPR “must address the *Graham* factors,” Tesla’s Ground 2 allegations fail to do so. *See Eizo*, Paper 11 at 29-30 (citing *Graham*, 383 U.S. at 17–18). Here, Tesla alleges:

[T]o the extent that the Patent Owner argues, or the Board finds, that the predictions generated by the Ross-Cox model do not correspond to (1) user responses expected to be received responsive to presenting the sensor data to a plurality of users or (2) user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users, . . . the combination of Ross, Cox, and Ogale teaches these elements.

Pet. 48. This type of conclusory analysis fails to identify the differences between the claimed subject matter and the prior art and is precisely the type of flawed allegation that the Board rejected in *Eizo Corp.* There, 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 such that a proper obviousness analysis could be performed. *Id.* Other Board decisions have reached the same result. *See, e.g., Moses Lake*, Paper 6 at 18; *eBay*, Paper 15 at 21.

Accordingly, the Board should reject Petitioner’s Ground 2 allegations.

VIII. THE CHALLENGED CLAIMS ARE NOT UNPATENTABLE UNDER GROUND 3

For Ground 3, Tesla alleges that Zhang renders obvious claims 1-4, 7-13, and 16-22. *See* Pet. 57-76. Just like Ross and Cox, however, Zhang fails to teach elements [b] and [c] of the independent claims. In addition, Tesla’s single-reference obviousness combination fails to properly address the *Graham* factors. The Board should therefore find the challenged claims not unpatentable under Ground 3.

A. Zhang Does Not Teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object” (Elements 1[b], 10[b], and 19[b])

Just like Ross and Cox, Zhang does not teach elements 1[b], 10[b], or 19[b], which each require “providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received

responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object.”

As an initial matter, Petitioner’s allegations for limitation [b] are difficult to follow because they repeatedly cite to wide swaths of disclosure from Zhang. For example, on pages 64-66, the Petition repeatedly cites Zhang’s “Abstract, ¶¶0025, 0047, 0049, 0051-0065, claims 1, 4, 5, Figs. 4, 5, 9, 10” and “Abstract, ¶¶0025, 0047, 0049, 0051-0065, claims 1, 4, 5, Figs. 4, 5, 9, 10.” Supporting allegations by citing wide swaths of Zhang’s disclosure makes the Petition impossible to decipher. For example, paragraphs 0051-0065 of Zhang span four pages. In these four pages, Zhang discusses at least Figures 7 through 10. These paragraphs cover multiple embodiments of Zhang, as Zhang refers several times to “an example embodiment” or “a particular embodiment” in this swath of disclosure. Worse still, between paragraphs 61 and 62, Zhang includes a section heading that reads “Alternative Embodiment of the Prediction-Based System and Method for Trajectory Planning of Autonomous Vehicles.” Neither Tesla nor its expert address, much less resolve, the fact that many of its citations from paragraphs 0051-0065 appear in different embodiments. By failing to specify with any particularity the portions of Zhang relied upon, and by failing to reconcile citations to multiple embodiments from Zhang, Petitioner has failed to meet its burden. *See Harmonic*, 815 F.3d at 1363 (“[T]he Petitioner has the burden from the onset to show with particularity why the

patent it challenges is unpatentable.”); *Liberty Mut.*, 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].”); *see also* 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(4).

Setting aside this deficiency, Zhang does not teach that its model predicts anything about what users’ responses would be if presented with the sensor data. Instead, Zhang teaches that its training process can use either “real world, human behavior data” (Ex. 1006, [0049]) or training data that is “labeled using human labelers” (*id.*, [0051]). Regardless of which data is used, Zhang does not teach that its model predicts users’ responses. Instead, Zhang’s model predicts “vehicle or object trajectories.” *Id.*, [0053]. And, nothing in Zhang suggests that these “vehicle or object trajectories” are “an output statistical summary characterizing a distribution of user responses.” Nor does Tesla explain how they are. Ex. 2039, ¶¶ 130-131.

The two paragraphs of Zhang that Tesla focuses on do not support its argument. *See* Pet. 63. Paragraph [0025] of Zhang merely indicates that “the vehicle may . . . determine a predicted behavior of at least one other vehicle in the context of the environment[] [and] determine a confidence level that may correspond to a likelihood of the at least one other vehicle to perform the predicted behavior.” Ex. 1006, [0025]. And, paragraph [0058] repeatedly discusses predicting trajectories using “trajectory prediction module 175.” *Id.*, [0058]. Nothing in these paragraphs,

or the rest of Zhang, teaches that these predicted trajectories (or confidence levels) amount to “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users,” as required by the challenged claims. Ex. 2039, ¶ 132.

Here too, Tesla’s expert declaration adds nothing to the obviousness analysis, instead just parroting the language of the Petition. *Compare* Ex. 1003, ¶¶ 172-177 with Pet. 63-67. The Board should thus give Dr. Janét’s opinions little to no weight. *See, e.g., Xerox*, Paper 9, at 15, 19; *Kinetic Techs*, Paper 8 at 14-15; *see also* 37 C.F.R. § 42.65(a); *Upjohn*, 225 F.3d at 1311.

Zhang therefore fails to teach “predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users,” as required by independent claims 1, 10, and 19.

B. Zhang Does Not Teach “executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users” (Elements 1[c], 10[c], and 19[c])

Element [c] of each of independent claims 1, 10, and 19 requires “a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users.” For these limitations, the Petition simply refers back to its discussion of element 1[b]. Pet. 67-69. Zhang does not teach “generate a

statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users,” as required by elements 1[c], 10[c], and 19[c], for the same reasons discussed above with respect to element [b] of each claim. Ex. 2039, ¶ 137.

C. Challenged Dependent Claims

As discussed above, Zhang does not teach or suggest elements of claims 1, 10, and 19. Each of the remaining challenged claims in Ground 3 depend from one of those independent claims, and Zhang does not render them obvious for the same reasons.

D. The Petition Does Not Address the *Graham* Factors or Articulate a Proposed Modification or Supplement to Zhang.

Because Ground 3 sounds in obviousness, Tesla must address the *Graham* factors, which include explaining the differences between the challenged claims and the prior art. As Ground 3 is a single-reference obviousness assertion (as opposed to an anticipation theory), Petitioner presumably proposes to modify Zhang to arrive at the challenged claims. *See, e.g., Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016). (“Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.”). Tesla fails to articulate

differences between the challenged claims and Zhang, and Tesla does not specify the manner in which it proposes to modify Zhang to invalidate the challenged claims.

To the extent Petitioner's Ground 3 obviousness allegations attempt to supplement an alleged missing element in Zhang with expert testimony, the Petition is equally deficient. Again, the Petition does not specify the element of the challenged claims that is not disclosed by Zhang, much less articulate how it proposes to supplement Zhang with the knowledge of a person of ordinary skill to plug such hole. This is not a trivial oversight, as it is improper to supply a missing element with expert testimony. *See* OFFICE PATENT TRIAL PRACTICE GUIDE at § I.G. (“[B]ecause 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.”).

At his deposition, Dr. Janét could not explain any differences between Zhang and the challenged claims, other than to point to statements in his declaration where he believed a person who was not a POSITA could misunderstand Zhang's disclosure. Ex. 2043, pp. 42-76. Such allegations are not only irrelevant to the obviousness determination (which is performed from the perspective of a POSITA), they are not contained in the Petition or Dr. Janét's declaration and have thus been

waived. 35 U.S.C. § 103 (obviousness inquiry concerns “the differences between the claimed invention and the prior art . . . to a person having ordinary skill in the art to which the claimed invention pertains”); *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).

Because the Petition does not address the *Graham* factors, including a discussion of the shortcomings of Zhang and how it proposes to address them, the Board should reject Ground 3.

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.³ 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,

³ The printed matter doctrine is disfavored, “stand[ing] on questionable legal and logical footing.” *In re Lowry*, 32 F.3d 1579, 1583 (Fed. Cir. 1994) (citing *In re Gulack*, 703 F.2d 1381, 1385 n.8 (Fed. Cir. 1983)).

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.”).

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. *C R 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. 76-77. 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. 77. 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 “the sensor data displaying an object on the road.” While the claimed “sensor data” is defined as “displaying an object on the road,” the claim limitation does not attempt to claim specific content. The modifier “displaying an object on the road” merely describes the *types* of sensor data stored 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 "statistical summary" and "statistical summary data" are printed matter. But claim 1 is a "computer-implemented method" that involves "predict[ing] an output statistical summary," "executing the trained supervised learning based model to generate a statistical summary data," and "controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data." *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.”⁴ Pet 78. But this allegation

⁴ Tesla’s 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

is not true at all. For example, claim 1 is a “computer-implemented method” where “predict[ing] an output statistical summary,” “executing the trained supervised learning based model to generate a statistical summary data,” and “controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data.” 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, and the ultimate prediction produced by the claimed method. The challenged limitations are therefore functionally intertwined with the operation of the claimed 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.

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

X. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board find the challenged claims of the '344 patent not unpatentable.

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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 10,209 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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The undersigned certifies that the foregoing Patent Owner's Preliminary Response was served on June 15, 2026, to Lead and Back-up Counsel for Petitioner at the service address provided in Petitioner's Mandatory Notices:

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