

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

AUTONOMOUS DEVICES, LLC,
Patent Owner

Case: IPR2024-00745
U.S. Patent No. 11,663,474

PATENT OWNER'S RESPONSE

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EXHIBIT LIST

Exhibit	Description
2001	Declaration of Dr. Eli Saber
2002	Dr. Eli Saber CV
2003	Deposition transcript of Dr. Jason Janet dated December 19, 2024 in IPR2024-00745
2004	File history of U.S. Patent App. No. 15/340,991 (“the ’991 Application”)

I. INTRODUCTION

Autonomous Devices, LLC (“Patent Owner” or “PO”) respectfully submits this Response to the Board’s decision to institute trial (Paper 9, the “Decision”) and to the Petition for *inter partes* review (Paper 2, the “Petition” or “Pet.”) filed by Tesla, Inc. (“Petitioner” or “Tesla”). The Board instituted review of U.S. Patent No. 11,663,474 (“the ’474 patent”) (Ex. 1001) regarding Claims 45-47, 51, 56-57, 59-60 and 68-69 (the “Challenged Claims”) of the ’474 patent based on six grounds that rely primarily on U.S. Patent Application Pub. No. 2014/0089232 (“Buibas”) (Ex. 1005), U.S. Patent Application Pub. No. 2013/0325786 (“Sinyavskiy”) (Ex. 1006), U.S. Patent Application Pub. No. 2017/0024877 (“Versace”) (Ex-1007), U.S. Patent No. 9,604,359 (“Grotmol”) (Ex. 1008), and U.S. Patent No. 5,219,264 (“McClure”) (Ex. 1009). Decision, 7-8, 39.

Petitioner has not carried its burden of proving unpatentability of claims 56 and 57 by a preponderance of the evidence (35 U.S.C. § 316(e)). As explained below and in the accompanying Declaration of Patent Owner’s expert, Dr. Saber, Petitioner has not established that the above-cited prior art references disclose or suggest all of the limitations of Claims 56 and 57.¹ In addition, Petitioner’s expert, Dr. Janet,

¹ Patent Owner submits the Declaration of Dr. Eli Saber (Ex. 2001), an expert in the field of the ’474 patent. Ex. 2001, ¶¶1-19; Ex. 2002.

provided deposition testimony that supports Patent Owner's arguments that Claims 56-57 are not disclosed or suggested by the prior art.

II. THE '474 PATENT

The '474 patent, titled "Artificially intelligent systems, devices, and methods for learning and/or using a device's circumstances for autonomous device operation," discloses systems and methods for learning and using a device's circumstances for autonomous device operation. Ex. 1001, Abstract, 1:58-64. The '474 patent discloses systems and methods for autonomous driving by learning and using a device's circumstances including detecting objects with various properties along with correlated instruction sets for operating the device in various circumstances. *Id.*, 67:19-60, claim 45.

Prior to the innovations described in the '474 patent, "[c]ommonly employed device or system operating techniques lack[ed] a way to learn [the] operation of a device or system and enable autonomous operation of a device or system." *Id.*, 1:51-54. The '474 patent solved this problem by utilizing a sophisticated system for learning the scenarios encountered by a device and distilling those scenarios into a set of circumstance representations (which may include one or more object representations), inputting the circumstance representations into inputs of a knowledgebase that are correlated with instructions for operating a device, and then

using the correlated instructions that can be efficiently performed autonomously. *Id.*, 67:19-60, claim 45; Ex. 2001, ¶¶48-52.

Referring to Figure 38 (shown below) and the specification's description of Figure 38, for example, vehicle 98a includes sensors 92, such as a camera 92a, that capture the vehicle's 98a's surrounding. Ex. 1001, 162:58-164:15, Fig. 38, claim 45. The vehicle's computer(s) process the output from the sensors 92 to form a circumstance representation that includes object representations 625 representing objects 615aa-ad (people, boulders, materials, vehicles, etc.) in the vehicle's surrounding. *Id.*, Fig. 38. If a vehicle's computer(s) detect a match with a previously learned circumstance representation (*i.e.*, by inputting the incoming circumstance representation into inputs of a knowledgebase), the vehicle 98a performs autonomous operation using previously learned instructions 526 correlated with the previously learned circumstance representations or inputs for circumstance representations. *Id.*, 162:58-164:15, Fig. 38, claim 45. Ex. 2001, ¶¶48-52.

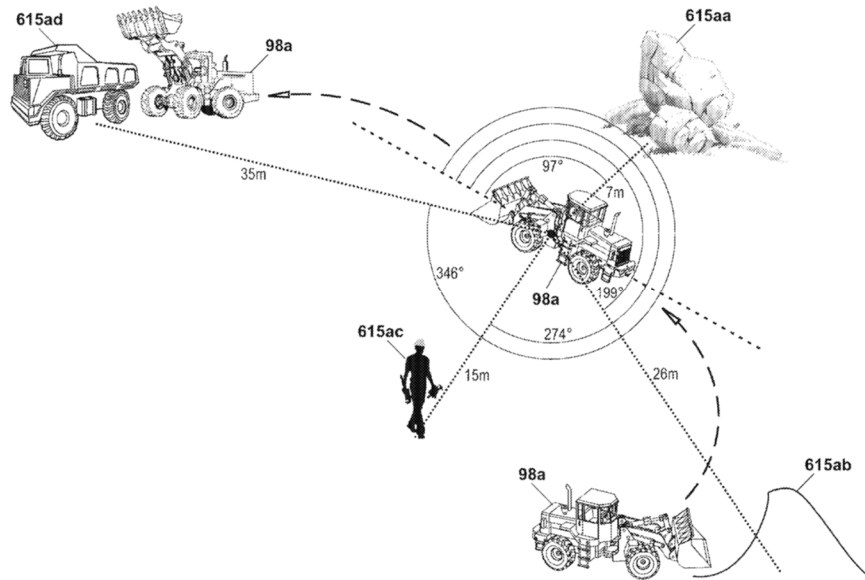


FIG. 38

Ex. 1001, Fig. 38.

The '474 patent describes and claims methods and systems implementing its innovative techniques for autonomous operation. Ex. 2001, ¶¶48-52. For example, one such method is claimed in claim 45. Claim 45 is directed to a first device with a knowledgebase that includes one or more inputs for inputting at least a portion of a circumstance representation, wherein the one or more inputs are correlated with one or more instruction sets for operating a second device. Ex. 1001, Claim 45. This claim uses correlations between inputs and instruction sets to achieve autonomous operation. In addition, claims 56 and 57 contain numerous limitations that the

Petition has not established are disclosed, suggested or rendered obvious by the cited references. Ex. 2001, ¶¶52.

III. PERSON OF ORDINARY SKILL IN THE ART

For purposes of this proceeding only, Patent Owner adopts Petitioner’s definition of a person of ordinary skill in the art (POSA). Pet., 7; *see also* Ex. 2001, ¶46. A POSA at the time of the invention of the ’474 patent would have at least: (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, systems engineering, or equivalent course work with two to three years of work experience in computer vision, image/video processing, and/or machine learning; or (2) a master’s degree in electrical engineering, computer engineering, computer science, systems engineering, or equivalent course work with a focus in computer vision, image/video processing, and/or machine learning. Pet., 7; *see also* Ex. 2001, ¶¶46-47.

IV. ALLEGED PRIOR ART

The Petition relies on several references for its unpatentability grounds, and those references are summarized below. Ex. 2001, ¶54.

A. BUIBAS (EX. 1005)

Buibas is titled “Neural Network Learning and Collaboration Apparatus and Methods” and discloses an “[a]pparatus and methods for learning and training in neural network-based devices.” Ex. 1005, Abstract. Buibas discloses a “robotic

brain” that “may comprise one or more neural networks.” *Id.*, ¶[0079]. Figure 10 of Buibas, shown below, discloses that a processing apparatus 1000 receives sensor input 1020. *Id.*, ¶[0136]. This input is transformed into an encoded signal 1026, which is sent to detectors 1002_n, which are used for object detection. *Id.*, ¶¶[0137]-[0139]; *see also* Ex. 2001, ¶¶55-56.

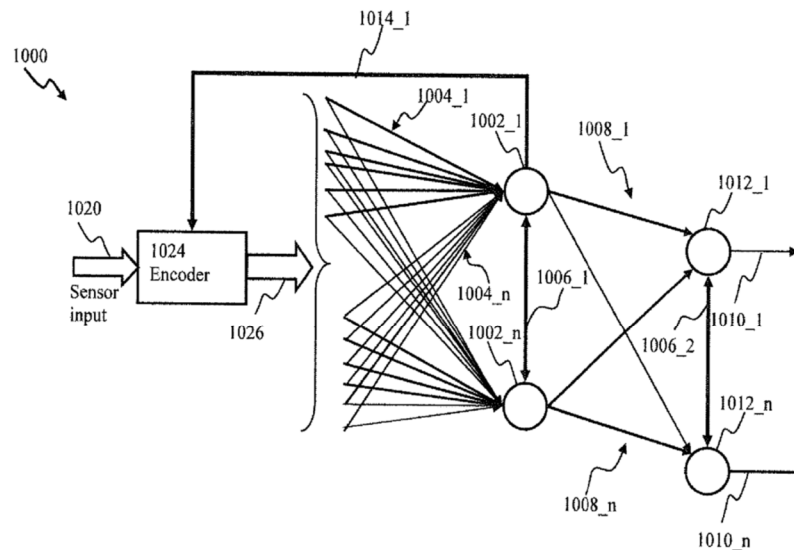


FIG. 10

Ex. 1005, Fig. 10.

Figure 4 from Buibas, shown below, discloses that weight vectors, which are vectors that comprise weight values, can be merged in merge 400, “where the parent[] A provides the portion 432 and the parent B provides the portion 434 to the off-spring 436.” *Id.*, ¶[0096]. Figure 4 merely shows that “offspring network

configuration (e.g., the weight vector W) 408 may be obtained using two parent weight vectors,” *id.*, ¶¶0095], and never discloses or suggests instruction sets for operating a device. Ex. 2001, ¶¶55-56.

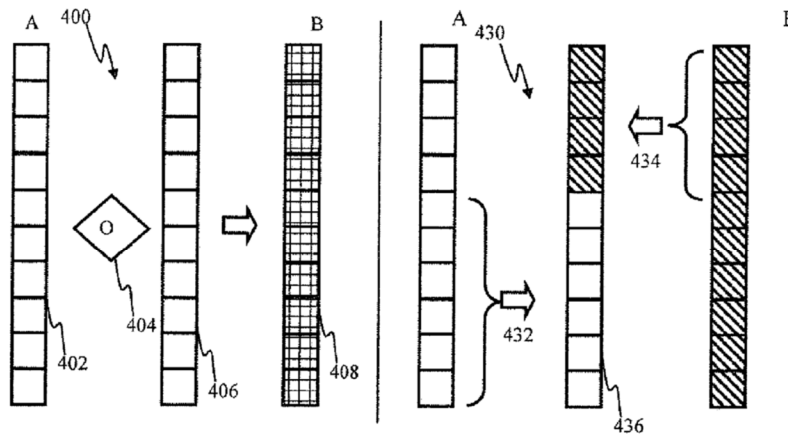


FIG. 4

B. GROTMOL (EX. 1008)

Grotmol discloses a method for training and operating a robotic device to follow a simple trajectory based on a simple sequence (*i.e.*, ordered buffer) of images. Ex. 1008, Abstract. If any circumstance occurs for which the simple trajectory is not trained (*i.e.*, different objects, etc.) the robot in Grotmol would not know what to do or would collide with an obstacle. Ex. 2001, ¶¶57-58. The robotic device “may utilize a camera” to store a “sequence of images of a visual scene seen when following a trajectory during training in an ordered buffer.” Ex. 1008, Abstract. During training, “[m]otor commands issued by a trainer corresponding to time instances when the images are acquired may be stored.” *Id.*, 39:17-19. During

autonomous operation, the robotic device may be configured to compare an acquired image “with one or more images from the training buffer in order to determine the most likely match.” *Id.*, Abstract. After an acquired image is matched to an image stored in the training buffer, the best match may be used “to predict motor command for controlling operation of a robot.” *Id.*, 27:57-58. Ex. 2001, ¶¶57-58.

Figure 1 from Grotmol, shown below, discloses that robot 160 includes sensor 166. *Id.*, 8:57-61. Sensor 166 provides “information associated with objects within the field-of-view 168.” *Id.*, 8:64-66. Grotmol discloses that its device also includes a memory that stores “training sets,” which may include “an instance of the video frame, an instance of the binary signal, and an instance of a motor control indication configured to cause the robot to execute an action.” *Id.*, 3:35-39. Ex. 2001, ¶¶57-58.

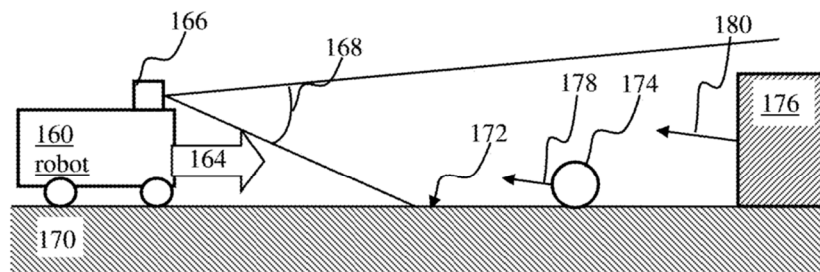


FIG. 1

Ex. 1008, Fig. 1.

C. SINYAVSKIY (EX. 1006)

Sinyavskiy is titled “Stochastic Spiking Network Learning Apparatus and Methods” and discloses a “framework” to “enable [an] adaptive spiking neuron signal processing system to flexibly combine different learning rules.” Ex. 1006, Abstract. Sinyavskiy discloses “spiking” neural networks that can be trained to control the operation of robotic devices. Ex. 1006, ¶¶[0185]-[0188]; Ex. 2001, ¶59.

V. CLAIM CONSTRUCTION

The claims in an *inter partes* review are construed using the same standard that applies in district court proceedings, as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 100(b) (2019). Claim terms are afforded “their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312-17). The Board, however, only construes the claims when necessary to resolve the underlying controversy. *Toyota Motor Corp. v. Cellport Systems, Inc.*, IPR2015-00633, Paper

11 at 16 (Aug. 14, 2015) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Patent Owner believes there is no need to construe any terms of the Challenged Claims, as there is not any underlying controversy regarding any terms at this time.

VI. THE CITED REFERENCES DO NOT RENDER CLAIMS 56-57 UNPATENTABLE

The Board instituted review of the ’474 patent based on Grounds 1A, 1B, 2A, 2B, 2C, and 2D. Decision, 39. In instituting review, the Board relied on the Petition and the testimony of Petitioner’s declarant, Dr. Janet (Ex. 1003). For the reasons discussed below, the cited references do not render Claims 56 and 57 unpatentable. Ex. 2001, ¶¶60-130.

A. Ground 1A Fails Regarding Claims 56 and 57

Regarding Ground 1A, Petitioner fails to show that Buibas in view of Sinyavskiy renders claims 56 and 57 of the ’474 patent obvious. Ex. 2001, ¶¶61-101. As explained below, Petitioner fails to show that Buibas in view of Sinyavskiy discloses or suggests multiple limitations in these claims. *Id.*

1. Claim 56: Buibas and Sinyavskiy do not disclose or suggest wherein the one or more inputs are further correlated with another one or more instruction sets for operating a third device

Claim 56, which depends from claim 46, states, in part:

wherein *the one or more inputs* are *further* correlated with *another one or more instruction sets for operating a third device*.

Ex. 1001, Claim 56 (emphasis added).

Petitioner first cites its discussion of claim element 45.1, Pet., 41-42, but that claim element does not include *further* correlating the one or more inputs with *another* instruction set for operating *a third device*, as required by claim 56, and only mentions instruction sets for operating a second device. Ex. 1001, Claim 45 (reciting for element 45.1: “a knowledgebase that includes one or more inputs for inputting at least a portion of a circumstance representation, wherein the *one or more inputs are correlated with one or more instruction sets for operating a second device*”); *see also* Ex. 2001, ¶63.

Petitioner next contends that “Buibas further discloses techniques for ‘merging’ brain images to combine behavior modules learned on two or more robots (a second device and a third device). For example, ‘non-interleaved’ network merges can be used ‘to combine capabilities of two (or more) parents or to add a capability to one of the parent network.’ TESLA-1005, ¶[0096], FIG. 4; *see generally id.*, ¶¶[0090]-[0098], [0124]-[0127], [0189], [0225], FIG. 9.” Pet., 41-42. But Petitioner’s contention and Petitioner’s citations of Buibas (each citation discussed in detail below) *do not even mention instruction sets, much less instruction sets for operating a third device*, Pet., 41-43. And Petitioner’s contention and citations

of Buibas further do not mention *any one or more inputs that are further correlated with another instruction set for operating a third device*. Ex. 2001, ¶64. Petitioner has not mapped what is specifically recited in claim 56 to prior art and instead makes highly general, overbroad statements.

In effect, Petitioner has not mapped one or more *inputs that are further correlated with another instruction set for operating a third device to any disclosure of Buibas or Sinyavskiy*. Petitioner expects the Board to ignore the specific language of claim 56 and use Petitioner's notions at an extremely high level of generality to somehow disclose or suggest specific claim language that *Petitioner's own citations of the prior art references do not mention*.

Petitioner's contention and citations of Buibas rely on Buibas Figure 4 and ¶[0096] (describing FIG. 4). Pet., 41-42. Below is Figure 4 showing that network weight updates and merging of weight vectors do not involve any instruction sets. Ex. 2001, ¶65. Figure 4 is described by Petitioner's own citations of Buibas that refer to "network weight update," "merging of weight vectors," "weights," and "merges" (including how they are used and implemented) throughout Petitioner's citations of Buibas. *Id.*

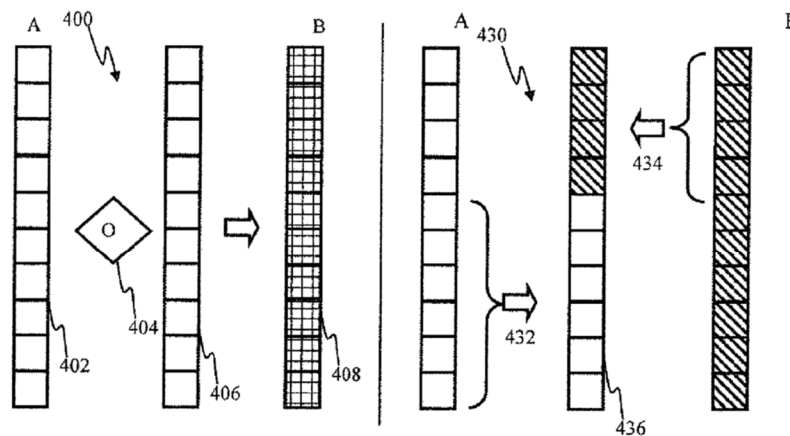


FIG. 4

Ex. 1005, Figure 4.

First, a neural network contains input neurons (*i.e.*, inputs) connected by connections with intermediate neurons that are connected by connections with output neurons (*i.e.*, outputs). Ex. 2001, ¶66. Output neurons or outputs provide instruction sets for operating a device. ***Connections among neurons are associated with weights. Weights are numerical values. Id.*** When an input is inputted into the input neurons or inputs, the neural network uses the weights of its connections to derive an instruction set for operating a device at the output neurons or outputs. *Id.*

Second, a ***weight vector*** (also referred to in Buibas as “network configuration,” “offspring network configuration (e.g., the weight vector W) 408,” Ex. 1005, ¶[0095] and other references) ***is a list of weights*** that are read/copied from the associations with connections among neurons of an originating/parent neural network as shown in Buibas FIG. 4 with respect to parent weight vector 402 as well

as parent weight vector 406. When parent weight vector 402 with its weights and parent weight vector 406 with its weights are merged (“merging” referred to in petitioner’s citations of Buibas) as shown, the result is an offspring weight vector 408 whose weights are then used to update (“update of network weights” referred to in Petitioner’s citations of Buibas) the weights of a neural network where the offspring weight vector is applied. Thus, merging of weight vectors results in another vector of weights, not instruction sets. Ex. 2001, ¶67. Next, it is important to realize that *a weight vector is not a neural network* since a weight vector does not include any neurons and instruction sets for operating a device. Ex. 2001, ¶67. The offspring weight vector is what its name says, a list of weights. *Id.* As can be immediately appreciated, Petitioner’s contention and Petitioner’s citations of Buibas describing updates of network weights and merging of weight vectors do not involve any instruction sets. *Id.* Petitioner’s argument that Buibas’s “network merges can be used ‘to combine capabilities of two (or more) parents or to add a capability to one of the parent network,’” Pet., 42, to meet the limitations of claim 56 is wrong for the following reasons:

First, a network merge is a phrase Buibas uses for a merge of weight vectors of the neural networks, not for merging of neural networks themselves (that cannot be done as explained below). Ex. 2001, ¶68. The entire section of Buibas titled “*Network Merges*” (Ex. 1005, ¶[0094-0098]) is explicitly dedicated to and

specifically describes merging of weight vectors. Ex. 2001, ¶68. Further, Buibas specifically states that “merges” are “network weight updates comprising two or more sources.” Ex. 1005, ¶[0094]. Even Further, Petitioner’s own citations of Buibas clearly show that a network merge is a merge of weight vectors of the neural networks (*see* Ex. 1005, ¶[0028] stating “FIG. 4 is a functional block diagram illustrating a **network merge** in accordance with one or more implementations” and *showing merging of weight vectors*). *See also* Ex. 1005, FIG. 4 (showing an example of merging of weight vectors and using the resulting merged weight vector to update weights of another neural network); *see also* Ex. 2001, ¶68.

Second, Petitioner’s contention of combining capabilities by a network merge (*i.e.*, merging weight vectors as Buibas specifically defines a “network merge” as discussed above) is not, and indeed does not even mention, further correlating the same one or more inputs with another instruction set, let alone an instruction set for operating a third device as required by claim 56. Ex. 2001, ¶69. Merging two weight vectors as Buibas specifically discloses network merges involves combining weights of weight vectors and does not involve any instruction sets, much less **further** correlating **the same** one or more inputs with **another** instruction set **for operating a third device** as a part of the merge process, and as required by claim 56. *Id.*

Third, in its merge process, Buibas explains that an “**‘offspring’ network configuration (e.g., the weight vector *W*)** 408 may be obtained **using two parent**

weight vectors,” Ex. 1005, ¶[0095], and that the merge “may be used . . . *to combine capabilities of two (or more) parents* or to add a capability to one of the parent network.” *Id.*, ¶[0096]. But “combining capabilities”/“adding a capability” by merging weight vectors and further correlating the same one or more inputs with another instruction set *are two totally different concepts*. Ex. 2001, ¶70. Buibas’s disclosure of obtaining an offspring weight vector or network configuration by combining two parent weight vectors says nothing about instruction sets (*see* Ex. 1005, FIG. 4 (showing weights in weight vectors being merged, not instructions sets being merged or even involved)) and, thus fails to contemplate further correlating another instruction set with the same one or more inputs, as required by claim 56. *Id.*; *see also* Ex. 1005, ¶¶[0097-0099] (discussing combining traits and adding traits to determine offspring weight vectors but never mentioning further correlating one or more inputs with another instruction set).

In addition, Buibas’s operations ([Eqn. 3] and [Eqn. 4], shown below; Ex. 1005, ¶¶[0097-0098]) used in merges to arrive at an offspring weight vector being indeed on weighs, instead of on instruction sets, is further explicit evidence that Buibas’s network weight updates and merges of weight vectors do not involve any instruction sets, and especially not instruction sets for operating a third device. Ex. 2001, ¶71.

$$W^{\text{eff}} = (W^A \text{ OR } W^B) \quad (\text{Eqn. 3})$$

$$W^{\text{eff}} = (W^A \text{ AND } W^B). \quad (\text{Eqn. 4})$$

Petitioner's additional citation to Buibas's disclosure of Figure 9 and its accompanying text, Pet., 41-42, again involves weights and only illustrates a "robotic brain update" or "network merge," Ex. 1005, ¶[0124], where splice points for the merge are selected, *source weights* for each segment are selected, and *target weights* are generated for each segment. *Id.*, ¶¶[0124-0127]. Petitioner's citation of Buibas describes merging of weights and never mentions that existing same inputs are further correlated with another instruction set for operating a third device when the weight merge occurs. *Id.*; *see also* Ex. 2001, ¶72.

Petitioner's further citations to Buibas ¶[0189] (generally discussing combining brain images), and ¶[0225] (generally discussing merging brain images), Pet., 42, also never mention instruction sets and further correlating the same one or more inputs with another instruction set for operating a third device. *See* Ex. 2001, ¶73. While Buibas ¶[0189] and ¶[0225] discuss merging brain images very generally without even a mention of *additional another* instruction set for operating *a third device*, the *same one or more inputs*, and how they are *further* correlated, Buibas makes clear in its other sections what its brain image merges actually involve and how they work:

(i) “[a]n authenticated user connecting through a user interface device 1202 connects to the cloud server, and identifies a brain image 1404 to be loaded onto the computerized neuromorphic apparatus 1150.” Ex. 1005, ¶[0183]. The robot then “downloads the selected brain image, and *set its synaptic weights appropriately.*” *Id.*

(ii) “The brain image 1404 may comprise *the network weights* so that the download effectuates *the weight configuration* of the computerized neuromorphic apparatus network.” *Id.*

(iii) “[T]he target configuration may comprise *network weights* downloaded into the target robotic device. In some implementations, the target configuration may comprise *network weight vectors* stored within the cloud server and available for subsequent downloads to one or more robotic devices. Buibas, ¶[0123].

This sample of unmodified quotes from Buibas confirm that what is shared and loaded from an originating robot into a receiving robot are weight values, not instruction sets, and especially not instruction sets for operating a third device further correlated with the same one or more inputs as required by claim 56. Ex. 2001, ¶¶73-74.

Petitioner next argues that “it would have been understood and obvious to a POSITA that the parents to a merged network that forms a partition of a brain image on the first device can be trained [by different users on different devices] such that

the inputs to the offspring brain image on the first device are correlated with commands (instruction sets) for operating both the second device and the third device,” Pet., 42, but this is conclusory, not supported by Buibas, and is wrong. Ex. 2001, ¶75. Petitioner cites no expert testimony to support this conclusory argument, and merely cites to its analysis of claim 51 and its previous citations of Buibas. Pet., 42. But *claim 51 does not claim further correlating an input with another instruction set for operating a third device* and only *recites a different concept* “wherein at least a portion of the one or more instruction sets for operating the second device is learned in a learning process that includes operating the second device at least partially by a user.” Ex. 1001, Claim 51. And as previously discussed, the portions of Buibas cited by Petitioner merely disclose network weight updates and merging of weight vectors, and say nothing about instruction sets, much less that the same one or more inputs are further correlated with another instruction set for operating the third device. Ex. 2001, ¶75.

Petitioner has failed to explain *at all* how a POSA reading Buibas’s disclosure would have arrived at the claimed invention of claim 56. Ex. 2001, ¶76. A POSA reading Buibas’s disclosure regarding updates of network weights and merging weight vectors would not have arrived at the invention of claim 56 because Buibas’s disclosure does not disclose, suggest, or even mention further correlating the same one or more inputs with another instruction set for operating a third device. *Id. It is*

important to realize that Claim 56 does not recite some general grouping of separate neural networks as partitions (partitions themselves are separate neural networks trained for different tasks) that each includes its own separate inputs, but recites “the [same] one or more inputs are further correlated with another one or more instruction sets for operating a third device.” Id.

*It is also important to realize that additional instruction sets cannot simply be added to existing instruction sets that are already correlated with existing same inputs in a knowledgebase (i.e., neural network). Ex. 2001, ¶77. As of the critical date, additional instruction sets could only be added to existing instruction sets that are already correlated with existing inputs **by retraining the knowledgebase with training sets that include the additional instructions sets.** Id. This is so because, during retraining, proper weights for correlations/connections are calculated/adjusted through backpropagation process (see Ex. 1001, 18:64-67) for specific instruction sets associated with specific same inputs in each training set. Id. Backpropagation calculates/adjusts the weights of the correlations/connections relative to other weights of other correlations/connections during retraining. Ex. 2001, ¶77. If one would simply add an additional instruction set to a trained knowledgebase (i.e., neural network), the weights of correlations/connections would be nonexistent or incorrect for the added instruction set, which would make the*

knowledgebase (*i.e.*, neural network) defective or potentially deadly in life-critical applications such as autonomous driving. *Id.*

A POSA would have understood that *further* correlating *the same one or more inputs* with *another* instruction set for operating *a third device* would require *retraining* the neural network of Buibas. Ex. 2001, ¶78, *Retraining a knowledgebase (i.e., neural network) does not involve merging disclosed in Buibas nor does Buibas disclose or suggest retraining a knowledgebase to correlate the same one or more inputs with another additional instruction set for operating a third device.* *Id.* Buibas’s disclosure of merging does not even suggest retraining the neural network to a POSA, and a POSA reading this disclosure would not have arrived at the invention of claim 56. *Id.*

To the extent that Petitioner argues that a brain image in Buibas is an entire neural network (although Buibas is clear in many quotes cited above that “the brain image 1404 may comprise *the network weights* so that the download effectuates *the weight configuration* of the computerized neuromorphic apparatus network,” Ex. 1005, ¶[0183]), instruction sets of this assumed neural network still *cannot simply be added to existing instruction sets that are already correlated with existing same inputs in another neural network, which cannot be done as discussed more just below.* Ex. 2001, ¶79. As discussed above, not even a single standalone additional instruction set can simply be added to existing instruction sets of an existing trained

knowledgebase without retraining with a training set that includes the additional instruction set (that Buibas does not mention, disclose, or suggest), let alone one or more instruction sets from another neural network. *Id.*

None of Petitioner's contentions, Petitioner's citations of Buibas, Buibas's figures, and Buibas's text assert, show, or describe a "merged" neural network where instruction sets of two neural networks are merged. Ex. 2001, ¶80. Such merging of instruction sets of two neural networks would require explanation of not only the addition of the instructions sets from one neural network to another (and Buibas and Petitioner's contentions do not even show this), but also how the additional instruction sets are correlated/connected with the same inputs via correlations/connections and/or intermediate neurons and how those correlations/connections are correctly weighted for proper statistical predictions of those additional instructions sets, which requires retraining the knowledgebase (*i.e.*, neural network) with training sets that include the additional instructions sets as discussed above. *Id.* Buibas does not show or describe merging instruction sets of two neural networks not because Buibas missed it, but ***because this cannot be done to form a single usable new neural network.*** *Id.* If merging of neural networks to obtain a single usable neural network could be done, no one would want to go through the very time consuming process of collecting very large data sets required for training neural networks and the process-intensive process of actual training a

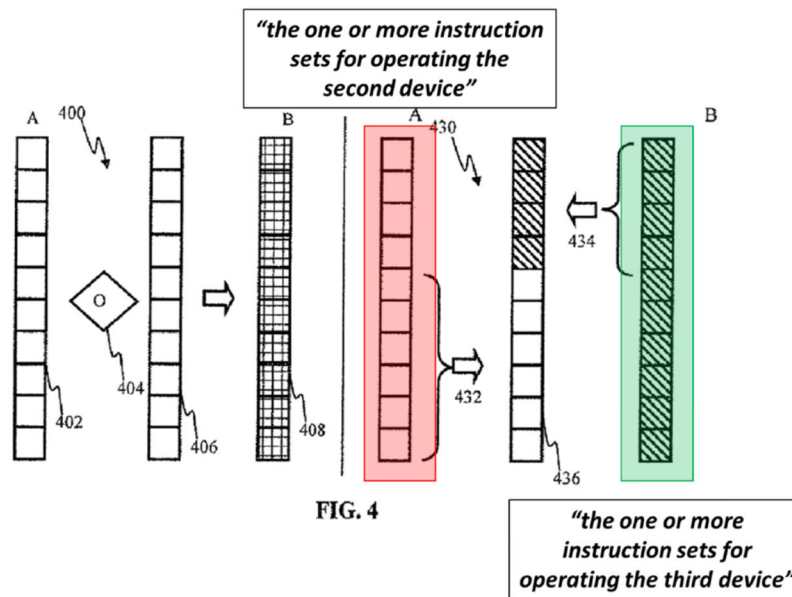
neural network. Instead, what Buibas actually shows and describes is the only thing that can potentially practically be merged, namely merging of weights in weight vectors of two neural networks that does not involve instruction sets as explained in Buibas FIG. 4 and throughout Buibas. *Id.*

In addition, Petitioner's expert, Dr. Janet, provided testimony during his cross-examination that supports the argument that Buibas and Sinyavskiy fail to disclose or suggest that the same one or more inputs are further correlated with another instruction for operating a third device. Dr. Janet testified that retraining a neural network requires resources, Ex. 2003, 71:1-72:6, but never mentioned that any of the prior art references disclose or suggest such retraining. Retraining a neural network does not involve merging in Buibas nor does Buibas or Sinyavskiy disclose or suggest retraining a knowledgebase to correlate the same one or more inputs with another additional instruction set for operating a third device as discussed above.

Turning to Petitioner's final annotated FIG. 4 from Buibas, the Petition specifically mapped Buibas's weights in weight vectors to the claimed instruction sets as shown below in the annotated Figure 4 from the Petition. Pet., 43. Ex. 2001, ¶81. But Buibas's weight vectors do not include any instruction sets or anything other than weights in the parent weight vector A, in the parent weight vector B, and in the offspring weight vector. *See* Ex. 1005, ¶¶[0089-0098], [0123-0127], [0179], [0183], Figure 4. The sections of Buibas cited by Petitioner regarding Buibas's

weight vectors deal with updating and merging weights or weight values and do not have anything to do with instruction sets that are claimed in claim 56. Pet., 41-43.

Ex. 2001, ¶81.



TESLA-1005, FIG. 4 (annotated and color added).

In addition, *a weight is a fundamentally different concept than the claimed instruction set*. Ex. 2001, ¶¶81-82. Weights are statistical “value[s]” or “numeric attribute[s],” Ex. 1001, 104:10-13, that can be “properties of [a] connection[,]” Ex. 1005, ¶[0077]. Conversely, instruction sets are commands for operating a device or its actuators. Ex. 1001, 152:13-29; Ex. 2001, ¶82. A clear fundamental difference between a weight and an instruction set of operating a device is that a weight is a number such as **0.238** that signifies a weight of an associated connection, whereas

an instruction set is a command such as “***Devicel.moveForward(27)***... for moving a Devicel forward 27 units.” Ex. 1001, 142:53-57; *see also* Ex. 2001, ¶82.

Dr. Janet also provided testimony during his cross-examination that supports the argument that Buibas’s weight vectors are not instruction sets. Dr. Janet testified that an instruction set “***would be the commands that would be given to motors and various other components,***” Ex. 2003, 49:1-4, while a weight vector is “***just going to be a block of values.***” *Id.*, 80:4-9. According to Dr. Janet, weight vectors include weights that are values including numeric attributes or symbolic labels, *id.*, 59:13-61:15, and weight vectors are an array or matrix of values. *Id.*, 66:4-67:3, 77:4-78:13. Dr. Janet’s testimony confirms that Buibas’s weight vectors cannot be and are not the claimed instruction sets, as they are totally different from instruction sets.

Dr. Janet also confirmed that weights are distinct from instruction sets when he stated that ***weights are a “means of correlating input values to output,” or instruction sets at the outputs,*** *id.*, 79:6-17. He explained that a weight vector “is not going to tell you much about that neural network,” *id.*, 80:4-9, and he agreed that ***weights would not be enough, on their own, to yield a particular instruction set from a particular input.*** *Id.*, 83:12-18. An “***array of values***” or ***weights is “not enough” to arrive at a correlated instruction set from a given input.*** *Id.*, 84:3-10. All of this testimony confirms that Buibas’s weights are indeed distinct from the

claimed instruction sets, are not the claimed instruction sets, and that Buibas does not disclose or suggest claim 56.

In sum, **(i)** none of Petitioner's citations of Buibas even mention instruction sets, and as a result, none of them further mention the same one or more inputs further correlated with another instruction set for operating a third device, **(ii)** Buibas's updates of network weights and merging of weight vectors do not involve instruction sets at all, **(iii)** Buibas's combining and merging brain images also never mention instruction sets, and as a result, further do not mention correlating the same one or more inputs with another instruction set for operating a third device, **(iv)** instruction sets (standalone or from another neural network) cannot simply be added to existing instruction sets that are already correlated with existing same inputs in a knowledgebase (*i.e.*, neural network) without the required retraining that Buibas does not disclose or suggest, and **(v)** Buibas's weights are a totally different concept than instruction sets.

Further, Petitioner does not rely on Sinyavskiy for this limitation of claim 56 and Sinyavskiy still does not contemplate this limitation of claim 56. Ex. 2001, ¶83. Thus, the Buibas-Sinyavskiy combination fails to disclose or suggest the same one or more inputs are further correlated with another one or more instruction sets for operating a third device as required by claim 56. *Id.*

2. **Claim 56: Buibas and Sinyavskiy do not disclose or suggest wherein at least a portion of the another one or more instruction sets for operating the third device or at least an information related to the another one or more instruction sets for operating the third device is learned in another learning process that includes operating the third device at least partially by another user**

Claim 56 requires, among other things:

wherein at least a portion of the *another one or more instruction sets for operating the third device* or at least an information related to the *another one or more instruction sets for operating the third device* is learned in *another learning process* that includes *operating the third device* at least partially *by another user*.

Ex. 1001, Claim 56.

Petitioner argues with no support that “it would have been understood and obvious to a POSITA that the parents to a merged network that forms a partition of a brain image on the first device can be trained on separate devices, e.g., a second device and a third device, by respective users” in multiple learning processes. Pet., 42. Petitioner *provides no basis for this obviousness argument*. Ex. 2001, ¶86. And while Petitioner does point out that Buibas discloses multiple devices, Pet., 42, Petitioner does not identify *a single instruction set nor a single learning process* in either Buibas or Sinyavskiy to support why the claimed another instruction set or its related information is learned in another learning process involving another user and

a third device would have been obvious based on the references' disclosure. Ex. 2001, ¶85-86.

In its argument, Petitioner cites Buibas, “TESLA-1005, ¶[0096], FIG. 4; *generally id.*, ¶[0090]-[0098], [0124]-[0127], [0189], [0225], FIG. 9,” but none of Petitioner’s citations mention *any instruction sets*. Pet., 42. Ex. 2001, ¶87. Further, none of Petitioner’s citations mention *another learning process*. *Id.* Petitioner fails to map *instruction set for operating the third device* or its related information are *learned in another learning process* that includes *operating a third device* by *another user*, to the disclosure of Buibas or Sinyavskiy. *Id.* Instead, Petitioner cites extreme generalities and expects the Board to ignore the specific language of claim 56 and use Petitioner’s notions at an extremely high level of generality to somehow disclose or suggest specific claim language that *Petitioner’s own citations of the prior art references do not mention*.

Petitioner next contends with no explanation or support that it would have been obvious to learn another instruction set or its related information in another learning process involving another user operating a third device with Buibas’s brain image “such that the inputs to the offspring brain image on the first device are correlated with commands (instruction sets) for operating both the second device and the third device.” Pet., 42. Ex. 2001, ¶87. Petitioner’s contention is wrong at least for the following reasons:

First, Petitioner’s citations of Buibas involving merging of brain images *do not even mention instruction sets* as discussed above in § VI.A.1. Ex. 2001, ¶88. Also, Buibas is clear in many quotes cited in § VI.A.1 from throughout Buibas that “the brain image 1404 may comprise *the network weights* so that the download effectuates *the weight configuration* of the computerized neuromorphic apparatus network.” Ex. 1005, ¶[0183].

Second, Petitioner’s obviousness argument lacks *any supporting explanation or expert testimony*. Ex. 2001, ¶88. Something that is not explained and supported by Petitioner, and indeed not even mentioned in Petitioner’s own citations of Buibas, is clearly not obvious to a POSA. *Id.*

Third, Petitioner has failed to provide a reason to modify Buibas by the teaching of Sinyavskiy (and indeed did not even rely on Sinyavskiy at all for claim 56) to achieve this limitation of claim 56 and has failed to provide evidence of a reasonable expectation of success for this limitation of claim 56 in the proposed modification. Ex. 2001, ¶89. Petitioner’s entire discussion of combining Buibas and Sinyavskiy only discusses network partitioning (Petitioner argues that “[i]ndeed, it would have been obvious to partition Buibas’ spiking networks according to the specific techniques disclosed in Sinyavskiy,” Pet., 13) and how that result is achieved by the combination, *but never mentions how the result is achieved of*

instruction set for operating the third device or its related information are learned in another learning process that includes operating a third device by another user.

Moreover, common knowledge of a POSA may only be used to supply a missing claim limitation when that limitation is “unusually simple and the technology particularly straightforward.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016). Petitioner's argument is incorrect.

First, the portion of the claim at issue here involves not only a process that uses different instances of instruction sets, different learning processes, different devices, and different users, but specifically requires that this claimed process results in *the same one or more inputs further correlated with instruction sets learned in different learning processes involving different users operating different devices integrated into a single knowledgebase*. Ex. 1001, Claim 56. Petitioner has not established that this process and its result are straightforward or unusually simple to a POSA. Ex. 2001, ¶90.

Second, as discussed in detail in § VI.A.1 above, any additional instruction sets (especially instruction sets learned in an additional learning process involving an additional user operating an additional device) *cannot be simply added to the existing instruction sets that are already correlated with the existing inputs*. Ex. 2001, ¶91. The correlations or weights of correlations of those additional instruction sets would be nonexistent or inaccurate since there was no backpropagation (*see* Ex.

1001, 18:64-67) to calculate/adjust the weights of the correlations/connections relative to other weights of other correlations/connections in a *retraining of the knowledgebase with training sets that include the additional instructions sets*. Ex. 2001, ¶91. Such retraining of the knowledgebase with additional instruction sets learned in an additional learning process involving an additional user operating an additional device is a complex process that is not straightforward or unusually simple. *Id. Further evidence of this is the fact that none of the prior art references mention such retraining. Id.*

Furthermore, Buibas and Sinyavskiy cannot and do not disclose or suggest the claimed another instruction set of claim 56 at all because Petitioner has mapped the instruction sets of claim 56 to weights in Buibas's weight vectors, *which are totally different concepts*, as discussed in detail in § VI.A.1. Ex. 2001, ¶92.

In sum, (i) Petitioner has not mapped instruction set for operating the third device or its related information are learned in another learning process that includes operating a third device by another user to the disclosure of Buibas or Sinyavskiy, (ii) Petitioner has not provided reasoning for its obviousness contention, (iii) Petitioner has not provided expert support for its obviousness contention, (iv) Petitioner's own citations of Buibas do not mention key elements of claim 56 ([a] any instruction sets as well as [b] another learning process), (v) Petitioner has not pointed to nor do the prior art references disclose or suggest the required retraining

since additional instruction sets (especially instruction sets learned in different learning processes that involve different devices and different users) cannot be simply added to existing instruction sets correlated with existing inputs, and (vi) Petitioner has actually mapped the instruction sets of claim 56 to weights in Buibas's weight vectors in § VI.A.1 above, which are totally different concepts. Each of these points confirms that a POSA would not have arrived at the invention of claim 56 based on Buibas and Sinyavskiy. Ex. 2001, ¶¶89-93.

Petitioner does not rely on Sinyavskiy for this limitation of claim 56 and Sinyavskiy still does not contemplate this limitation of claim 56. As a result, Petitioner cannot rely on obviousness in view of Sinyavskiy as somehow curing the deficiencies identified above in Buibas. Thus, Buibas-Sinyavskiy fails to disclose or suggest that another instruction set for operating the third device or its related information is learned in “another learning process that includes operating the third device at least partially by another user.” Ex. 1001, Claim 56; *see* Ex. 2001, ¶93.

3. Claim 57: Buibas and Sinyavskiy do not disclose or suggest wherein the one or more inputs are further correlated with another one or more instruction sets for operating a third device

Claim 57 recites the first limitation of claim 56 (discussed above in § VI.A.1), which states:

wherein *the one or more inputs* are *further* correlated with *another one or more instruction sets for operating a third device*.

Ex. 1001, Claim 57.

Petitioner first argues that the “Buibas-Sinyavskiy combination renders obvious [claim 57] for each of the reasons described above with respect to [claim] 56.” Pet., 43. But Petitioner has failed to show that Buibas or Sinyavskiy disclose or suggest claim 57 of the ’474 patent for the same reasons discussed above in § VI.A.1 (included here by reference) with respect to the same limitation in claim 56. Ex. 2001, ¶95. Some of the reasons for Buibas and Sinyavskiy failure to disclose or suggest the features of claim 56 and features of claim 57 namely include: **(i)** none of Petitioner’s citations of Buibas even mention instruction sets, and as a result, none of them further mention the same one or more inputs further correlated with another instruction set for operating a third device, **(ii)** Buibas’s updates of network weights and merging of weight vectors do not involve instruction sets at all, **(iii)** Buibas’s combining and merging brain images also never mention instruction sets, and as a result, further do not mention correlating the same one or more inputs with another instruction set for operating a third device, **(iv)** instruction sets (standalone or from another neural network) cannot simply be added to existing instruction sets that are already correlated with existing same inputs in a knowledgebase (*i.e.*, neural network) without the required retraining that Buibas does not disclose or suggest,

and (v) Buibas's weights that Petitioner maps to instruction sets in claim 56 are a totally different concept than instruction sets. *Id.*

Further, Petitioner does not rely on Sinyavskiy for this limitation of claim 57 and Sinyavskiy still does not contemplate this limitation of claim 57. Ex. 2001, ¶96. Thus, the Buibas-Sinyavskiy combination fails to disclose or suggest the ***same one or more inputs*** are ***further*** correlated with ***an additional another*** one or more instruction sets for operating ***an additional third device*** as required by claim 57. *Id.*

Petitioner next contends that claim 57 is obvious because “mere duplication of parts has no patentable significance unless a new and unexpected result is produced,” Pet., 43 (quoting *In re Harza*, 274 F.2d 669 (CCPA 1960)). Petitioner is wrong as Petitioner's own citation of *Harza* states that ***“new and unexpected result” applies to “mere duplication of parts,” but claim 57 does not merely duplicate an element from claims 45 and 46 from which claim 57 depends.*** Ex. 2001, ¶97. Mere duplication would recite “the one or more inputs are further correlated with another one or more instruction sets for operating ***the [same] second device.***” Unlike mere duplication, claim 57 actually recites “the one or more inputs are further correlated with another one or more instruction sets for operating ***a third device.***” Petitioner ignores that *Harza* applies only to mere duplication of the ***same*** elements and that the element that claim 57 recites is not duplicated or the same as any element in higher level claims. Ex. 2001, ¶97.

Practically, mere duplicating of the same one or more instruction sets for operating the second device, as Petitioner suggests, **would be nonsensical since it would not provide any additional knowledge in the knowledgebase**. Ex. 2001, ¶98. Actually, **it would create a potential issue** since correlations/connections from inputs should lead to unique instruction sets in a knowledgebase (*i.e.*, neural network) that relies on inputs correlated with instructions. *Id.* Otherwise, the knowledgebase would be confused by which instruction set of the duplicate instruction sets to output. So, duplicating the same instruction sets correlated with the same inputs does not make sense.

To the extent that new and unexpected result applies to claim 57 in view of *Harza* at all, **what would have been expected** (the opposite of new and unexpected) as of the priority date in 2016 is that a knowledgebase with inputs correlated with instruction sets for operating one (first) device is used on that same device. Ex. 2001, ¶99. **It was new and unexpected** to have a knowledgebase with **the same inputs** correlated with instruction sets for operating a second device **and further correlated** with instruction sets for operating a third device, be used on another (first) device as claimed in claim 57. *Id.*

In addition, the claimed invention provides a new and unexpected result in its very recitation. Ex. 2001, ¶100. It is one level of complexity to copy a knowledgebase with inputs correlated with instruction sets for operating a second

device (that does not include inputs correlated with instruction sets for operating any other devices) to a first device (*i.e.*, copying knowledge learned on one device to another device). *Id.* But ***it is an entirely different higher level of complexity to make an integrated knowledgebase with the same inputs correlated with instruction sets for operating multiple different devices operable on the first device.*** *Id.* This is especially clear in view of the inability to simply add an additional instruction set (especially instruction set for operating an additional device) to existing instruction sets that are already correlated with existing inputs without retraining with a training set that includes the additional instruction set (that Buibas and Sinyavskiy do not mention, disclose, or suggest) as discussed in more detail above in § VI.A.1. *Id.* The claimed ***same one or more inputs correlated with*** an instruction set for operating ***the second device*** and ***further correlated with another*** instruction set for operating ***a third device*** in a single integrated knowledgebase being ***operable on the first device*** would have been new and unexpected as of the priority date of the '474 patent in 2016. *Id.*

Finally, Petitioner did not rely on Sinyavskiy at all for any of the limitations in claim 57 for this ground. Pet., 43-44. As a result, Petitioner cannot rely on obviousness in view of Sinyavskiy as somehow curing the deficiencies identified above in Buibas. Ex. 2001, ¶101.

B. Ground 2C Fails Regarding Claims 56 and 57

Regarding Ground 2C, Petitioner fails to show that Grotmol in view of Buibas renders claims 56 and 57 of the '474 patent obvious. Ex. 2001, ¶¶102-130. Petitioner fails to show that Grotmol in view of Buibas discloses or suggests multiple limitations in these claims. *Id.*

1. Claim 56: Grotmol and Buibas do not disclose or suggest wherein the one or more inputs are further correlated with another one or more instruction sets for operating a third device

Claim 56, which depends from claim 46, states, in part:

wherein *the one or more inputs* are *further* correlated with *another one or more instruction sets for operating a third device*.

Ex. 1001, Claim 56 (emphasis added).

Petitioner first states that “Grotmol discloses that the inputs of its adaptive controller (knowledgebase) are correlated with control outputs (instruction sets) stored in and produced by the adaptive controller, as described above in Ground 2A with respect to [45.1]” and “Grotmol discloses that the control outputs can be learned in a learning process by which the user operates a robot, as described above with respect to [47] and [51] (operating the ... device at least partially by another user),” Pet., 80-81, but this contention *does not mention an instruction set for operating a third device* at all *nor even attempt to explain* how the inputs of the adaptive

controller are *further* correlated with *another* instruction set for operating *a third device*. Ex. 2001, ¶104. Petitioner does not attempt to explain this since Grotmol nowhere discloses or suggests this further correlation of the same one or more inputs with another instruction set for operating a third device. Pet., 81. On the contrary, Petitioner suggests this in stating “[t]o the extent it is argued or determined that Grotmol does not expressly disclose that the inputs to an adaptive controller on a first device are correlated with control outputs (instructions sets) learned on at least two other devices (*i.e.*, a second device and a third device).” *Id.*

In the same contention above, Petitioner’s citations to its own arguments in claims 45.1, 47, and 51, Pet., 81, are baseless because claims 45, 47, and 51 recite “one or more inputs are correlated with one or more instruction sets for operating *a second device*” and do not recite the actual limitation of claim 56: “wherein the one or more inputs are further correlated with another one or more instruction sets for operating *a third device*.” Ex. 2001, ¶105. Claim 56 requires that the *same* one or more inputs be *further* correlated with an *additional another instruction set* for operating *an additional third device*, which is beyond what claims 45, 47, and 51 recite and what Petitioner’s arguments for those claims address. *Id.*

Petitioner next cites Grotmol’s disclosure that “the trained configuration may be loaded to one or more other robots in order to provide learned behaviors,” (Pet., 81 (citing Ex. 1008, 33:30-35)). Petitioner’s argument is incorrect. **First**, Petitioner’s

citation discusses loading a trained configuration from one robot to other robots to provide learned behaviors and *says nothing about (and indeed does not even mention) instruction sets*, let alone that the same one or more inputs are further correlated with an additional instruction set for operating an additional third device, which is what claim 56 requires. Ex. 2001, ¶106. **Second**, Grotmol discloses operating *one (first) device* in training and the knowledge gained from this training in Grotmol, when loaded into *another (second) device*, is still knowledge of operating that one (originating) device, which is about loading the previously learned knowledge on one robot into another robot and not the further correlation that claim 56 requires: the *same* one or more inputs *further* correlated with *an additional another* instruction set for operating an *additional third device*. *Id.* In other words, all of the instruction sets for operating the first robot where they were learned are still the same instruction sets for operating the same first robot (not a third robot) when they are loaded into a second robot in Grotmol. *Id.* Since Grotmol discloses learning on one robot and loading this knowledge to a second robot without mentioning an instruction set for operating a third robot, nothing in Grotmol even remotely suggests that the same inputs are further correlated with another instruction for operating a third device, as claimed in claim 56. *Id.*

Turning to the asserted Grotmol-Buibas combination, Petitioner's argument that "[t]o the extent it is argued or determined that Grotmol does not expressly

disclose that the inputs to an adaptive controller on a first device are correlated with control outputs (instructions sets) learned on at least two other devices (*i.e.*, a second device and a third device), these features nonetheless would have been obvious in view of Buibas. TESLA-1003, ¶160,” is wrong and not supported by Buibas. Pet., 81; *see* Ex. 2001, ¶¶107-108. Petitioner’s argument is incorrect.

First, the single paragraph in its expert report cited by Petitioner, Pet., 81, to support its obviousness argument merely repeats the Petition’s citations of Buibas and ***never attempts to explain how*** Buibas discloses further correlating the same one or more inputs with additional another instruction set for operating a third device. Ex. 2001, ¶107.

Second, as discussed above in § VI.A.1, Buibas fails to disclose or suggest the same one or more inputs are further correlated with another one or more instruction sets for operating a third device because **(i)** none of Petitioner’s citations of Buibas even mention instruction sets, and as a result, none of them further mention the same one or more inputs further correlated with another instruction set for operating a third device, **(ii)** Buibas’s updates of network weights and merging of weight vectors do not involve instruction sets at all, **(iii)** Buibas’s combining and merging brain images also never mention instruction sets, and as a result, further do not mention correlating the same one or more inputs with another instruction set for operating a

third device, (iv) instruction sets (standalone or from another neural network) cannot simply be added to existing instruction sets that are already correlated with existing same inputs in a knowledgebase (*i.e.*, neural network) without the required retraining that Buibas does not disclose or suggest, and (v) Buibas's weights that Petitioner maps to instruction sets in claim 56 are a totally different concept than instruction sets. Ex. 2001, ¶108.

Petitioner's next contention that Buibas "describes techniques for sharing and merging behaviors learned on multiple different robots into a single controller. TESLA-1005, ¶¶[0070], [0090]-[0100], [0103], [0225]," Pet., 81, is also wrong. Ex. 2001, ¶109. The citations from Buibas that Petitioner's contention relies on provide:

(i) "download such *stored state information [i.e. weights]* and apply it to a second neural network," Ex. 1005, ¶[0070],

(ii) "The network updates illustrated in FIG. 3 may comprise for instance *a complete weight update 300, where the existing trained weights vector W 302 is replaced with a different weight vector 304.*" Ex. 1005, ¶[0090]-[0100],

(iii) "The interleaved network merge may be used in some implementations to generate *new weight vector for a network* configured to

be use by off-spring configured to implement (a subset) of parent functionality.” Ex. 1005, ¶[0103], and

(iv) “The merging of brain images involves the combination of one brain image with another brain image.” Ex. 1005, ¶[0225]. *See also id.*, ¶[0183] (Buibas defining its brain image: “[T]he brain image 1404 may comprise *the network weights* so that the download effectuates *the weight configuration* of the computerized neuromorphic apparatus network.”).

Petitioner’s contention and *Petitioner’s citations of Buibas above do not even mention instruction sets, much less instruction sets for operating a third device*, Pet., 41-43. Ex. 2001, ¶110. And as a result, none of Petitioner’s citations identify *any same one or more inputs that are further correlated with additional another instruction set for operating an additional third device. Id.* Petitioner has not mapped what is specifically recited in claim 56 to prior art and instead makes highly general, overbroad statements. *Id.* In effect, Petitioner has not mapped one or more inputs that are further correlated with another instruction set for operating a third device to any disclosure of Grotmol or Buibas. *Id.* Petitioner expects the Board to ignore the specific language of claim 56 and use Petitioner’s notions at an extremely high level of generality to somehow disclose or suggest specific claim language that *Petitioner’s own citations of the prior art references do not mention.*

To the extent that Petitioner argues that a brain image in Buibas is an entire neural network (although Buibas is clear in many quotes cited above that “the brain image 1404 may comprise *the network weights* so that the download effectuates *the weight configuration* of the computerized neuromorphic apparatus network,” Ex. 1005, ¶[0183]), instruction sets of this assumed neural network still *cannot simply be added to existing instruction sets that are already correlated with existing same inputs in a another neural network, which cannot be done* as discussed above in § VI.A.1. Ex. 2001, ¶111. Not even a single standalone additional instruction set can simply be added to existing instruction sets of an existing trained knowledgebase without retraining with a training set that includes the additional instruction set (that Buibas does not mention, disclose, or suggest), let alone one or more instruction sets from another neural network. *Id.*

In sum, none of Petitioner’s citations of Grotmol or Buibas, or other Grotmol or Buibas disclosure, mention any *same* one or more inputs that are *further* correlated with *additional another* instruction set for operating *an additional third device*. Thus, the Grotmol-Buibas combination fails to disclose or suggest this limitation of claim 56. Ex. 2001, ¶112.

2. **Claim 56: Grotmol and Buibas do not disclose or suggest wherein at least a portion of the another one or more instruction sets for operating the third device or at least an information related to the another one or more instruction sets for operating the third device is learned in another learning process that includes operating the third device at least partially by another user**

Claim 56 requires, among other things:

wherein at least a portion of the *another one or more instruction sets for operating the third device* or at least an information related to the *another one or more instruction sets for operating the third device* is learned in *another learning process* that includes *operating the third device* at least partially *by another user*.

Ex. 1001, Claim 56.

Petitioner first states that “Grotmol discloses that the inputs of its adaptive controller (knowledgebase) are correlated with control outputs (instruction sets) stored in and produced by the adaptive controller, as described above in Ground 2A with respect to [45.1]. *See supra* §IV.C.2 at [45.1],” and “Grotmol discloses that the control outputs can be learned in a learning process by which the user operates a robot, as described above with respect to [47] and [51] (operating the ... device at least partially by another user). *See supra* §§IV.C.2.[47], [51].” Pet., 80-81. But Petitioner’s citations to its own arguments in claims 45.1, 47, and 51 are baseless because claim element 45.1 does not recite *any learning process* that includes *operating any device* by *any user*, and claims 47 and 51 recite instruction set for

operating *the second device* or its related information is learned in a *[single] learning process* that includes operating *the second device [not an additional third device]* at least partially by *a [single] user*. Ex. 2001, ¶114. None of claims 45, 47, and 51 recite the actual limitation of claim 56: “another instruction set for operating the third device or its related information is learned in another learning process that includes operating the third device by another user” nor its constituent elements “*another instruction set for operating the third device,*” “*another learning process,*” “*operating the third device,*” and “*another user,*” which are all beyond what claims 45, 47, and 51 recite and what Petitioner’s arguments for those claims address. *Id.*

Petitioner next cites Grotmol’s disclosure that “the trained configuration may be loaded to one or more other robots in order to provide learned behaviors,” (Pet., 81 (citing Ex. 1008, 33:30-35)), but Petitioner’s citation of Grotmol and Grotmol in general discloses training in which *one* user operates *one* device. Ex. 2001, ¶115. The knowledge gained from this training in Grotmol, when loaded into another device, is still knowledge of one user operating one (originating) device, which is about loading the previously learned knowledge on one robot into another robot and not the learning that claim 56 requires: *another instruction set for operating the third device* or its related information *is learned* in *another learning process* that includes *operating the third device* at least partially by *another user*. *Id.*

Petitioner's citation of Grotmol above and Grotmol in general first fails to disclose or suggest *another one or more instruction sets for operating the third device*. Ex. 2001, ¶116. As discussed above in § VI.B.1, Grotmol's disclosure of loading previously learned knowledge of operating one robot into another (second) robot does not disclose "another instruction set for operating the third device" since this limitation of claim 56 involves *the third device* that Grotmol does not disclose or suggest, *in addition to the first and second devices* referred to in Grotmol. *Id.* Petitioner has not established how Grotmol discloses, and Petitioner cannot as Grotmol does not disclose, the claimed third device, much less another instruction set for operating the third device, as required by claim 56. Pet., 81.

Petitioner's citation of Grotmol above and Grotmol in general also fails to disclose or suggest the claimed *"another user,"* as Grotmol only discloses a single user using a device and does not even mention another user, let alone another user operating a third device in another learning process. Ex. 2001, ¶117. Petitioner provides no basis for its argument and merely states that "Grotmol discloses that the control outputs can be learned in a learning process by which *[a single] the user* operates a robot, as described above with respect to [47] and [51]." Pet., 81. But claims 47 and 51 recite only a single "a user" and do not recite "another user" at all. Ex. 2001, ¶117. Therefore, Petitioner's citation of its discussion of claims 47 and 51 in the Petition also never mentions the "another user" limitation of claim 56. Pet.,

81. *Since Petitioner only contends a single “the user”, and relies on claims 47 and 51 that do not recite “another user” at all and its arguments for claims 47 and 51 that do not discuss “another user” at all, Petitioner has failed to map the “another user” limitation of claim 56 to anything in any of the prior art references.* Ex. 2001, ¶117.

Petitioner’s citation of Grotmol above and Grotmol in general next fails to disclose or suggest the claimed *“another learning process that includes operating the third device.”* Ex. 2001, ¶118. Petitioner’s citation of Grotmol is about *loading* the previously learned knowledge on one robot into another robot and NOT the *learning* that claim 56 requires. *Id.* Petitioner ignores that loading a trained configuration from a first robot to a second robot does not constitute an additional another learning process involving operating a third device, as claimed in claim 56. *Id.* Petitioner’s contention is baseless given that Grotmol does not even mention *another learning process that includes operating the third device.* *Id.*

Turning to Buibas, Petitioner argues that “[t]o the extent it is argued or determined that Grotmol does not expressly disclose that the inputs to an adaptive controller on a first device are correlated with control outputs (instructions sets) learned on at least two other devices (*i.e.*, a second device and a third device), these features nonetheless would have been obvious when further considering the teachings of Buibas. TESLA-1003, ¶160. Buibas, for example, describes techniques

for sharing and merging behaviors learned on multiple different robots into a single controller. TESLA-1005, ¶¶[0070], [0090]-[0100], [0103], [0225].” Petition 81. Petitioner’s argument is wrong for the following reasons:

First, as discussed above in § VI.A.2: **(i)** Petitioner has not mapped instruction set for operating the third device or its related information are learned in another learning process that includes operating a third device by another user to the disclosure of Buibas, **(ii)** Petitioner has not provided reasoning for its obviousness contention, **(iii)** Petitioner has not provided expert support for its obviousness contention, **(iv)** Petitioner’s own citations of Buibas do not mention key elements of claim 56 ([a] any instruction sets as well as [b] another learning process), **(v)** Petitioner has not pointed to nor does Buibas disclose or suggest the required retraining since additional instruction sets (especially instruction sets learned in different learning processes that involve different devices and different users) cannot be simply added to existing instruction sets correlated with existing inputs as discussed above in § VI.A.1, and **(vi)** Petitioner has actually mapped the instruction sets of claim 56 to weights in Buibas’s weight vectors in § VI.A.1 above, which are totally different concepts. Ex. 2001, ¶¶119-123.

Second, Petitioner’s contention *does not mention or even contend another learning process involving another user at all*. Ex. 2001, ¶¶120-123. Thus,

Petitioner has not mapped the another learning process that involves another user claimed in claim 56 to anything in Buibas. *See* Pet., 81.

Third, the portions of Buibas cited by Petitioner only discuss merging and do not discuss *any instruction sets at all*, let alone *an additional another instruction set for operating a third device* or its related information *learned in an additional another learning process* involving an *additional another user*. Ex. 2001, ¶¶122. Petitioner has not mapped what is specifically recited in claim 56 to prior art and instead makes highly general, overbroad statements. Petitioner expects the Board to ignore the specific language of claim 56 and use Petitioner’s notions at an extremely high level of generality to somehow disclose or suggest specific claim language that *Petitioner’s own contention and citations of the prior art references do not mention*.

Fourth, the single paragraph in its expert report cited by Petitioner, Pet., 81, to support its obviousness argument merely repeats the Petition’s citations of Buibas and never establishes how Buibas discloses or suggests this limitation of claim 56. Ex. 2001, ¶122.

In sum, Grotmol-Buibas fails to disclose or suggest that another instruction set for operating the third device or its related information is learned in “another

learning process that includes operating the third device at least partially by another user” required by claim 56. Ex. 2001, ¶¶119-123.

3. Claim 57: Grotmol and Buibas do not disclose or suggest wherein the one or more inputs are further correlated with another one or more instruction sets for operating a third device

Claim 57 recites the first limitation of claim 56 (discussed above), which states:

wherein *the one or more inputs* are *further* correlated with *another one or more instruction sets for operating a third device*.

Ex. 1001, Claim 57.

Petitioner first argues that the “Grotmol-Buibas combination renders this claim obvious for at least the reasons addressed above with respect to [56].” Pet., 82. But Petitioner has failed to show that Grotmol or Buibas disclose or suggest claim 57 of the ’474 patent for the same reasons discussed above in § VI.B.1 with respect to the same provision in claim 56. Ex. 2001, ¶125. Namely, Grotmol discloses training in which *one* user operates *one* device, does not mention a third device, and as a result, does not disclose or suggest that inputs are *further correlated* with the *another one or more instruction sets for operating a third device*. *Id.* And, as discussed above in § VI.A.1, Buibas’s merging does not mention instruction sets at all, and as a result, does not disclose or suggest *the same one or more inputs* are

further correlated with *another one or more instruction sets for operating a third device* as required by claim 57. *Id.* Thus, the Buibas-Sinyavskiy combination fails to disclose or suggest this limitation of claim 57.

Petitioner next contends “the limitations in claim 45 directed to ‘one or more instruction sets for operating the second device’ further would have been rendered obvious by the Grotmol-Buibas combination in view of Buibas’ teachings for sharing trained controllers among devices and for each of the reasons described above in the combination overview and with respect to claims 56 and 57. TESLA-1005, ¶¶[0070]-[0071], [0184], [0188], [0196], [0201]; TESLA-1003, ¶162; *supra*, §§IV.C.2, [47], [51].” Pet., 82. Petitioner’s argument is incorrect. First, Petitioner’s same citations of Buibas as in claim 56 do not mention this limitation of claim 57 for the same reasons as discussed above in §§ VI.A.1 and VI.B.1. Ex. 2001, ¶126. Second, claims 45, 47, and 51 recite “one or more inputs are correlated with one or more instruction sets for operating *a second device*” and do not recite the actual limitation of claim 57: “one or more inputs are further correlated with another one or more instruction sets for operating *a third device*.” *Id.* Claim 57 requires that the *same* one or more inputs be *further* correlated with an *additional another instruction set* for operating *an additional third device*, which is beyond what claims 45, 47, and 51 recite and what Petitioner’s arguments for those claims address. *Id.*

Petitioner next argues “mere duplication of parts has no patentable significance unless a new and unexpected result is produced,” Pet., 82 (quoting *In re Harza*, 274 F.2d 669 (CCPA 1960)). Petitioner is wrong as Petitioner’s own citation of *Harza* states that **“new and unexpected result” applies to “mere duplication of parts,” but claim 57 does not merely duplicate an element from claims 45 and 46 from which claim 57 depends.** Ex. 2001, ¶127. Mere duplication would recite “the one or more inputs are further correlated with another one or more instruction sets for operating *the [same] second device.*” Unlike mere duplication, claim 57 actually recites “the one or more inputs are further correlated with another one or more instruction sets for operating *a third device.*” *Id.* Petitioner ignores that *Harza* applies only to mere duplication of the same elements and that the element that claim 57 recites is not duplicated or the same as any element in higher level claims. *Id.*

Practically, mere duplicating of the same one or more instruction sets for operating the second device, as Petitioner suggests, **would be nonsensical since it would not provide any additional knowledge in the knowledgebase.** Ex. 2001, ¶128. Actually, **it would create a potential issue** since correlations/connections from inputs should lead to unique instruction sets in a knowledgebase (*i.e.*, neural network) that relies on inputs correlated with instructions. *Id.* Otherwise, the knowledgebase would be confused by which instruction set of the duplicate

instruction sets to output. *Id.* So, duplicating the same instruction sets correlated with the same inputs does not make sense. *Id.*

To the extent that new and unexpected result applies to claim 57 in view of *Harza* at all, ***what would have been expected*** (the opposite of new and unexpected) as of the priority date in 2016 is that knowledgebase with inputs correlated with instruction sets for operating one (first) device is used on that same device. Ex. 2001, ¶129. ***It was new and unexpected*** to have a knowledgebase with ***the same inputs*** correlated with instruction sets for operating a second device ***and further correlated*** with instruction sets for operating a third device, be used on another (first) device as claimed in claim 57. *Id.*

Finally, the claimed invention provides a new and unexpected result in its very recitation. Ex. 2001, ¶130. It is one level of complexity to copy a knowledgebase with inputs correlated with instruction sets for operating a second device (that does not include inputs correlated with instruction sets for operating any other devices) to a first device (*i.e.*, copying knowledge learned on one device to another device). *Id.* But ***it is an entirely different higher level of complexity to make an integrated knowledgebase with the same inputs correlated with instruction sets for operating multiple different devices operable on the first device.*** *Id.* This is especially clear in view of the inability to simply add an additional instruction set (especially instruction set for operating an additional device) to existing instruction sets that are

already correlated with existing inputs without retraining with a training set that includes the additional instruction set (that Grotmol and Buibas do not mention, disclose, or suggest) as discussed in more detail above in § VI.A.1 included here by reference. *Id.* The claimed *same one or more inputs correlated with* an instruction set for operating *the second device* and *further correlated with another* instruction set for operating *a third device* in a single integrated knowledgebase *being operable on the first device* would have been new and unexpected as of the priority date of the '474 patent in 2016. *Id.*

VII. CONCLUSION

For the foregoing reasons, Petitioner has failed to prove by a preponderance of the evidence that claims 56 and 57 are unpatentable. Patent Owner respectfully requests that the Board confirm the patentability of claims 56 and 57.

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Respectfully submitted,

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CERTIFICATION OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S RESPONSE** specified in 37 C.F.R. § 42.24 have 11,819 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. §42.24(b)(1). This word count was prepared using Microsoft Word 2016.

Dated: January 17, 2025

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CERTIFICATION OF SERVICE

The undersigned hereby certifies that a copy of this **PATENT OWNER'S RESPONSE** and supporting exhibits have been served on Petitioner via email on the following counsel of record for Petitioner:

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