

Case No. IPR2023-01046

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT, CORP.,
Petitioner,

v.

REALD SPARK, LLC,
Patent Owner.

Case No. IPR2023-01046
Patent No. 10,740,985

PATENT OWNER'S SURREPLY

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TABLE OF EXHIBITS

Exhibit #	Reference Name
EX-2001	Declaration of Dr. Eli Saber
EX-2002	<i>Curriculum Vitae</i> of Dr. Eli Saber
EX-2003	Microsoft's Answering Claim Construction Brief as filed in <i>RealD Spark, LLC v Microsoft Corporation</i> , U.S. District Court, Western District of Washington, Case No. 2:22-cv-00942-TL
EX-2004	Exhibit 1 to Microsoft's Answering Claim Construction Brief as filed in <i>RealD Spark, LLC v Microsoft Corporation</i> , U.S. District Court, Western District of Washington, Case No. 2:22-cv-00942-TL): Kononenko <i>et al.</i> “Learning to look up: Realtime monocular gaze correction using machine learning.” <i>CVPR 2015: IEEE/CVF Conference on Computer Vision and Pattern Recognition, Boston, MA, USA, 7-12 June 2015 (pp. 4667-4675).</i>
EX-2005	Exhibit 2 to Microsoft's Answering Claim Construction Brief as filed in <i>RealD Spark, LLC v Microsoft Corporation</i> , U.S. District Court, Western District of Washington, Case No. 2:22-cv-00942-TL: File History, Restriction Notice, Aug. 15, 2019; Response to Restriction Notice, Oct. 15, 2019
EX-2006	Exhibit 3 to Microsoft's Answering Claim Construction Brief as filed in <i>RealD Spark, LLC v Microsoft Corporation</i> , U.S. District Court, Western District of Washington, Case No. 2:22-cv-00942-TL: U.S. Provisional Application 62/542,661
EX-2007	Exhibit 4 to Microsoft's Answering Claim Construction Brief as filed in <i>RealD Spark, LLC v Microsoft Corporation</i> , U.S. District Court, Western District of Washington, Case No. 2:22-cv-00942-TL: Adriana Romero <i>et al.</i> , <i>Fitnets: Hints for Thin Deep Nets</i> (2014)
EX-2008	Supplemental Declaration of Dr. Eli Saber
EX-2009	Deposition Transcript of Dr. Lina J. Karam, Expert for Petitioner
EX-2010	A. Murat Tekalp, “Digital Video Processing”, Prentice Hall 1995

I. INTRODUCTION

REALD SPARK, LLC, (“RealD”) respectfully submits this Sur-reply in support of the patentability of claims 1-14 and 16-19 of U.S. Patent No. 10,740,985 (“the ’985 Patent”).

First, Ganin (Grounds I and II) does not disclose two machine learning algorithms, and thus does not render the ’985 Patent claims invalid. Ganin’s explicit disclosures confirm it describes a single machine learning algorithm (“MLA”) that performs coarse and fine steps. Because Ganin only discloses one MLA, it likewise cannot disclose two MLAs using the same training data. Grounds I and II thus fail.

Second, the Chalom-Aslan combination (Grounds III – V) does not render the ’985 Patent claims obvious because there is no motivation—express or implied—to combine these references. Petitioner ignores the teachings of Chalom and Aslan, and fails to explain how they would be combined or how they would operate. Even if a POSITA took Petitioner’s arguments at face value, the combination fails to disclose each of the following claim elements: (1) a second MLA that receives both first editing and first selection instructions, (2) a second MLA that uses first reference data, or (3) first and second reference data that are different from one another. As such, Grounds III – V also fail.

RealD requests that the Board find each of claims 1-14 and 16-19 not unpatentable over the prior art.

II. GANIN DOES NOT ANTICIPATE THE SECOND MACHINE LEARNING ALGORITHM ELEMENTS OF THE CHALLENGED CLAIMS.

A. Ganin’s training data shows it discloses one MLA rather than two.

As set forth in RealD’s Response, Ganin does not disclose a second MLA or, if it does, Ganin does not use the same training data for both MLAs as required by independent claims 1 and 18. *See* Response at 9-20. In Reply, Petitioner first argues that Ganin’s single set of training data does not mean Ganin discloses only one machine learning algorithm (“MLA”). *See* Reply at 3-6. In doing so, Petitioner ignores a fundamental construct of all MLAs: they must have training data that represents the input and output of their task. If the tasks are different, i.e., a “coarse” warping task and a “fine” warping task, the training data must also be different. EX-2008 at ¶¶ 42-46, 85-87. Otherwise, the MLAs have no way to learn the different tasks they are to perform.

Strangely, Petitioner relies on the ’985 Patent and Aslan to support its contention that Ganin discloses two MLAs. However, citing different patents’ teachings cannot overcome the explicit teachings of Ganin. *See Zenith Elecs. Corp. v. PDI Comm’n Sys., Inc.*, 522 F.3d 1348, 1363 (Fed. Cir. 2008) (“Anticipation requires a showing that each element of the claim at issue, properly construed, is found *in a single prior art reference.*”) (emphasis added). Moreover, Petitioner misunderstands the issues RealD raises with Ganin. If Ganin’s coarse and fine

modules were separate MLAs as Petitioner suggests, then each of these alleged MLAs would require different training data because these MLAs perform different tasks. *Id.* at ¶¶ 85-87. In particular, if Ganin taught a “coarse” MLA, it would need training data with a “coarse” input image and a “coarse” output image to perform the “coarse” adjustment task. *Id.* Likewise, for a “fine” MLA, Ganin would need to provide training data with a “fine” input image and a “fine” output image to perform the “fine” adjustment task. *Id.* Petitioner’s expert concedes this point. EX-2009 at 106:1-21 (testifying that “if you want to optimize the flow of the first model, the coarse module, . . . you have to give the ground truths there, too.”). Since Ganin does not include different sets of training data, it cannot perform two different tasks through two different MLAs. Therefore, Ganin only discloses a single MLA. *Id.*

RealD’s expert testimony is consistent with this conclusion. He concludes that because Ganin uses one set of training data, it includes one MLA performing one task. He repeatedly emphasizes during this discussion that Ganin has “one single end-to-end architecture. . . . So those are not separate architectures . . .” EX. 1061:172:8-19; *see also id.* at 165:18-166:8 (explaining that a neural network “doesn’t mean that’s a whole new machine learning algorithm on it – by it – on its own . . . That doesn’t mean they are two networks that are trained separately et cetera. . . [I]t’s a single end-to-end architecture, and that’s not the same context as the ’985.”); *id.* at 158:21-159:1 (explaining Ganin’s disclosure of a single

architecture is very clear). In short, the coarse and fine modules are “part of a single architecture.” *Id.* at 159:8-14. Ganin therefore discloses one MLA, not two as required by the ’985 Patent claims.

B. Ganin’s single objective function shows it discloses one MLA rather than two.

Petitioner next suggests that the number of objective functions in a system does not reflect the number of MLAs. *See* Reply at 6-8. Petitioner again ignores the context of Ganin and supports its argument with irrelevant conjecture. The point here is that Ganin discloses a “coarse” task and a “fine” task. The outputs are therefore a “coarse” output and a “fine” output. To assess the quality of how the allegedly different MLAs perform these different tasks, the system must necessarily use different objective functions. EX-2008 at ¶¶ 94-95, 102.

More specifically, an MLA can measure how well it has learned a task with an error calculation called an “objective function.” Response at Section V.A.1; *id.* at 13-14; EX-2008 at ¶¶ 73, 94-102. A typical objective function is called an “ l_2 -distance” that measures how far away the actual output is from the desired output present in the training pair. EX-2008 at ¶ 99, n.1. If, as Petitioner contends, Ganin discloses a coarse MLA and a fine MLA, there will need to be a coarse objective function and a fine objective function. The coarse objective function would determine how well Ganin transforms a coarse input into a coarse output. The fine objective function would determine how well Ganin transforms a fine input into a

fine output. But Ganin does not disclose a coarse objective function and a fine objective function, and thus, it cannot disclose a coarse MLA and a fine MLA. Again, Ganin discloses only one MLA, which is contrary to the claims of the '985 Patent.

Petitioner argues that the same objective function could be used for both the coarse and fine MLAs. This is incorrect. An assessment of how well Ganin transforms a coarse input into a coarse output has no bearing on how well Ganin performs its fine module transformations. *See, e.g.*, EX-1061 at 121:12-24 (explaining that an MLA needs an “appropriate objective function that you would utilize to do the training to essentially map the input images to the output images . . . so you need to define an objective function that would help essentially train the network to get to that level.”). Petitioner again tries to support its argument by improperly citing to other references (i.e., Aslan) and incomplete, out of context portions of RealD’s expert testimony. Again, Aslan’s disclosures relate to a different system having different features, and thus, has no bearing on what Ganin teaches. And, rather than concluding one objective function can be used to train two MLAs, the full answer of RealD’s expert explains that “[i]t depends a lot on the context, the application, what’s being done. You have to be more specific.” EX-1061 at 14:13-17.

Finally, both experts agree that an MLA requires training data and an objective function. EX-2008 at ¶¶85-87, 99-103; EX-1003 at ¶ 28 (“Training a machine learning model typically requires a training dataset, objective function . . . , and an optimization algorithm.”). What Petitioner omits is that if two different MLAs perform two different tasks, they will necessarily require two different sets of training data and two different objective functions. EX-2008 at ¶¶ 85-87, 99-103. Since Ganin does not teach different training data or different objective functions, it likewise cannot disclose two different MLAs as required by the ’985 Patent claims.

C. **Ganin’s description of a “single architecture” shows it discloses one MLA rather than two.**

Petitioner offers nothing of substance to rebut the following repeated statements from Ganin showing it discloses a single MLA:

- “[a]ll these operations are performed in a feed-forward manner . . . **the** resulting **neural network** can synthesize images with manipulated gaze.” EX-1006 at 1.
- “**a** new deep feed-forward **architecture** [] combines several principles of operation . . .” *Id.* at 2.
- “[t]**he** proposed system takes [various] input[s] . . . and sends them to **the** multi-scale **neural network** . . .” *Id.* at 4 (Figure 2).
- “3. **The Model**” *Id.* at 4 (heading).
- “[i]n this section, we discuss **the architecture** of our deep model . . . **The model** is trained on pairs of images . . .” *Id.* at 4.
- “[t]he task of **the network** is therefore the prediction of the warping field.” *Id.*

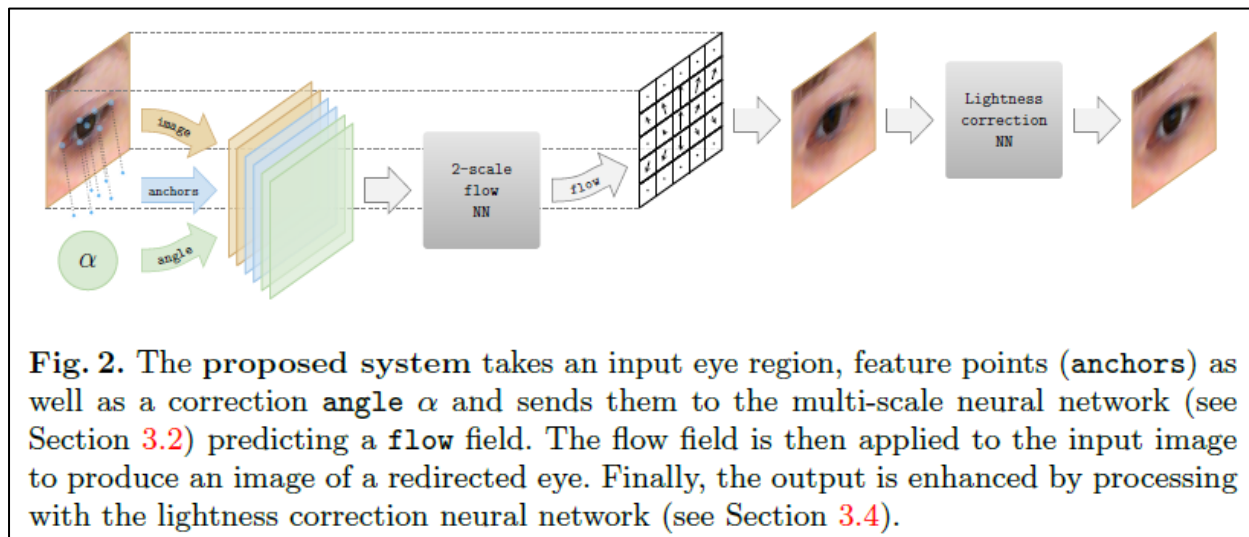
- “[a]ll operations . . . are implemented in a **single** feed-forward **architecture** . . .” *Id.*
- “[t]he **model** was trained end-to-end . . .” *Id.* at 8 (emphasis added to all).

Petitioner’s only counterpoint is to argue that Ganin—on one occasion—used the term “neural network” interchangeably with the term “module.” *See* Reply at 8-9. This cannot overturn the many references to a single architecture/model/network noted above.

As to Petitioner’s argument that the “lightness correction” module is a stand-alone MLA, this was not argued by Petitioner prior to its Reply¹ and as such, should be disregarded on that basis alone. *See* U.S. Patent Trial and Appeal Board, Consolidated Trial Practice Guide 73 (Nov. 2019) (“a petitioner “may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability.”). Further, even if one were to credit this argument, it simply reinforces that the coarse and fine modules are part of one MLA.

¹ Petitioner alleged that the coarse module was a first MLA, that the fine module was the second MLA, and never mentioned the “lightness correction” module in its Petition for any purposes. *See* Petition at 18 (“Ganin discloses ‘using a first machine learning algorithm [e.g., coarse warping module . . .]’”) and 21 (“Ganin discloses ‘using a second machine learning algorithm [e.g., fine warping module . . .]’”).

For example, as shown below, the “lightness correction” feature is identified by a single, gray box titled “Lightness correction NN.” EX-1006 at Figure 2. The coarse and fine modules are also collectively identified by a single, gray box titled “2-scale flow NN.” *Id.*



Id. As a result, if the gray “NN” box in Figure 2 is indicative of a single MLA, then the coarse and fine modules found within the “2-scale flow NN” are likewise a single MLA under Petitioner’s reasoning.

Ganin therefore teaches **one** set of training data, **one** training to complete **one** task, **one** objective function, and thus **one** MLA. *Id.* at ¶ 77-103. Ganin does not disclose the second MLA element as claimed in independent claims 1 and 18. EX-2008 at ¶¶ 77-103.

D. Because Ganin does not disclose two MLAs, it also cannot disclose a second MLA that uses “the same training data” as the first MLA.

Here Petitioner argues that Ganin discloses using a single set of training data,

so it must also disclose that both MLAs use the same training data. *See* Reply at 9-10. That is wrong for all the reasons noted above. Ganin discloses a single MLA, so the fact that Ganin discloses a single set of training data is unsurprising and irrelevant as it confirms that Ganin only teaches a single MLA rather than two.

Next, Petitioner alleges that the '985 Patent claims do not require the training data to be used “in a particular way.” Reply at 10. As with its first argument, this is irrelevant to the question at hand. The '985 Patent claims explicitly require a first MLA and a second MLA that use the same training data. *See, e.g.,* claim 1 at EX-1001 26:45-52. Ganin does not disclose these elements for all the reasons noted above. Whether and how the '985 Patent claims further use the training data “in a particular way” is unrelated to how many MLAs are claimed and whether they receive the same training data. Accordingly, the Board should not find the challenged claims unpatentable under Ground I.

E. Because Ganin does not disclose two MLAs, its combination with Liu also fails to disclose two MLAs.

The first and second MLA elements are also present in independent claim elements 16[E] and 19[E], and are not disclosed in Ganin for the same reasons. *See* Response at 20-21. Liu does not remedy these deficiencies as Liu has not been raised as disclosing any portion of elements 16[E] and 19[E]. *See* Petition at 38 (noting “16[A-G] collectively are substantively identical to 1[A-E] collectively and are therefore disclosed in Ganin for the same reasons.”). Thus, the Board should not find

the challenged claims unpatentable under Ground II.

III. THERE IS NO MOTIVATION TO COMBINE CHALOM AND ASLAN.

In its Response, RealD explained several reasons why there is no motivation to combine Chalom and Aslan. *See* Response at 21-28. Petitioner replies that there is motivation to combine based on (1) an “express” motivation to combine Chalom and Aslan, (2) a “known elements” theory, (3) an implicit motivation to combine the references for accuracy and/or efficiency gains, and (4) an allegation that Chalom’s motion vector fields are suitable for Aslan. *See* Reply at 11-14, 24-26. None of these is correct, nor can Petitioner raise some of these arguments at this late stage.

First, there is no “express” motivation to combine Chalom and Aslan. The Petition alleges that Chalom “expressly motivates” a combination with Aslan because Chalom’s random forest “may be **compressed** using any suitable technique or techniques.”² Petition at 43 (emphasis added). However, a POSITA does not

² In Reply, Petitioner seems to suggest an alternate “express” motivation rooted in Chalom’s training descriptions. Reply at 11-12. This allegation is new to the Reply, and thus cannot be considered at this late stage. *See, e.g.*, U.S. Patent Trial and Appeal Board, Consolidated Trial Practice Guide 73 (Nov. 2019) (stating that a

“compress” one MLA by adding another, entirely new MLA. This substantial increase in complexity and size is the opposite of “compression.” See EX-2008 at ¶ 67 (noting “[t]he use of a compressed representation reduces data storage and bandwidth requirements”); *id.* at ¶ 113 (explaining that adding a second MLA “will increase complexity”).

As one would expect, compression reduces the overall size and complexity of a dataset, and Chalom’s examples of compression are “parameterized surface fitting or the like.” EX-1005 at 13:61-65. RealD’s expert offers additional options for compression, such as reducing the size of Chalom’s MLA by including fewer trees/branches or by using the most probable trees/branches. EX-2008 at ¶¶ 114-115. All of these options result in one smaller, reduced MLA that is easier to store and implement. This is what is meant by compression; a POSITA does not “compress” an MLA by adding another MLA to substantially increase the overall size and complexity of the system. *Id.* Chalom’s desire for compression precludes increasing complexity and data size, so its teachings cannot form an express motivation to combine Chalom with Aslan.

Dr. Saber’s testimony is consistent with this conclusion. He explains that

petitioner “may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a *prima facie* case of unpatentability.”).

Chalom teaches a compression example that “store[s] the slope and intercept of that one line” instead of separately storing “all 10,000 points . . . in a database or lookup table.” EX-1061 at 183:11-185:15. As another example, Dr. Saber explains that compression could involve reducing the number of features from 10,000 to 6,000. *Id.* at 186:6-23. None of Dr. Saber’s examples in his report or deposition involve increasing the size and complexity of Chalom’s MLA.

Second, Petitioner argues that the Chalom-Aslan combination is nothing more than “[k]nown elements performing their ordinary functions to produce a predictable result.” Reply at 13. Petitioner failed to make this argument in its Petition, and it cannot do so now in its Reply. *See, e.g.*, U.S. Patent Trial and Appeal Board, Consolidated Trial Practice Guide 73 (Nov. 2019) (stating that a petitioner “may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability.”). Indeed, the Petition does not mention “known elements,” “ordinary functions,” “predictable results,” or what each of those factors are in the context of the Chalom-Aslan combination. *See* Petition at 45-47. Thus, contrary to Petitioner’s argument, there was no reason to provide a direct rebuttal to this non-existent allegation. But, even if Petitioner had made this argument, it fails for the reasons that follow.

Third, Petitioner’s motivation-to-combine allegations fail because there are no accuracy or efficiency issues within Chalom that would motivate a POSITA to

look to Aslan for gains in these areas. *See* Response at 23-27; *see also* EX-2008 at ¶¶ 105-115. In Reply, Petitioner argues that a generic desire for improved efficiency can provide motivation to combine Chalom and Aslan. Reply at 16. This is false. *ActiveVideo Networks, Inc. v. Verizon Comm's, Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012) (finding a generic assertion of efficiency “not sufficient and [] fraught with hindsight bias.”). And Petitioner’s reliance on *Jazz Pharmaceuticals* is misplaced if not misleading. That case quoted *In re Ethicon*, 844 F.3d 1344, 1351 (Fed. Cir. 2017), which simply holds that “[t]he normal desire of artisans to improve upon what is already generally known can provide the motivation to optimize *variables such as the percentage of a known polymer for use in a known device.*” *Id.* (emphasis added). Optimizing the percentage value of a known variable is a far cry from drastically increasing the complexity and size of a system by adding an entirely missing second MLA to Chalom for no apparent reason.

Petitioner’s Reply also argues that because a combination may have both advantages and disadvantages, any perceived lack of efficiency or accuracy cannot defeat the combination. Reply at 17-18. This misses the point. Petitioner alleges that the motivation to combine Chalom and Aslan rests in alleged improvements to efficiency and/or accuracy. Since there are no such improvements, the entire basis for Petitioner’s motivation to combine is unsupported and thus falls apart.

Finally, Petitioner replies that it is possible to combine Chalom and Aslan even though they use different techniques for different outcomes. *See* Reply at 24-25. However, Chalom’s motion vector fields and Aslan’s classes/labels are vastly different in structure and function, and do not support combination. *See* Response at 27-28. Dr. Saber’s deposition testimony does not undermine this conclusion. Rather, he stated that you could express motion vectors as integers “but that would obviously not be as accurate. And . . . you start to accumulate error when you do that.” EX-1062 at 251:16-24.

Nor does it matter if Chalom’s motion vector is expressed as an integer versus a decimal number. Dr. Saber’s testimony is that a motion vector field “represent[s] **two-dimensional** displacement vectors . . . [that] provide the appropriate amount of displacement in the x and y directions for [a particular] pixel.” EX-2008 at ¶ 119 (emphasis added). This type of system cannot be combined with Aslan’s classes/labels because they “represent **one dimension.**” *Id.* (emphasis added). There is therefore no ability to convert Chalom’s two-dimensional motion vector field into a one-dimensional class/label, and Petitioner has made no effort to explain how or why this is possible in any alleged combination. For all of these reasons, and those expressed in RealD’s Response, Petitioner failed to provide a sufficient motivation to combine Chalom and Aslan.

IV. CHALOM-ASLAN DOES NOT DISCLOSE A SECOND MLA THAT RECEIVES FIRST SELECTION INSTRUCTIONS.

Even if a POSITA was motivated to combine these references, Chalom-Aslan does not disclose a second algorithm that receives both the first editing instructions **and the first selection instructions** as recited in '985 claim 1. *See* EX-1001 at 26:50-27:3; *see also* Response at 28-30.

In Reply, Petitioner alleges that it sufficiently explained how Chalom-Aslan's second MLA receives the first selection instructions. Reply at 20. This is incorrect. While the Petition mentioned that Chalom-Aslan's reference data included first selection instructions, it made no attempt to argue that the first selection instructions are received by the second MLA. *See* Response at 28-30.

Petitioner then switches tactics, alleging that claim 1 does not require the first selection instructions to be passed to the second MLA. Reply at 20 (claiming that "PO's additional requirement that the first selection instructions must be passed to MLA2 is incorrect"). Petitioner is again incorrect.

First, claim 1 itself explicitly requires the second editing instructions be transmitted to the second MLA. Claim 1 recites "a second machine learning algorithm . . . using . . . the first reference data generated by the first machine learning algorithm." EX-1001 at 26:50-54. Claim 1 then goes on to require that "**the first reference data comprise** first editing instructions . . . and **first selection instructions.**" *Id.* at 26:58-60 (emphasis added). Thus, a plain reading of claim 1

requires that the second MLA use the “first reference data,” which includes both “first editing instructions . . . and first selection instructions.” *Id.* at 26:50-60.

Petitioner ignores the claim’s explicit requirements, instead suggesting that using the “first reference data” means using a portion of the first reference data that includes only the first editing instructions. But that is not what the claim states as noted above. And it defies the basic tenets of claim interpretation. In a similar case, the Federal Circuit admonished a defendant for failing to trace the antecedent basis of certain “memory” terms in arguing for a particular claim construction. *Innovative Memory Sys., Inc. v. Micron Tech., Inc.*, 781 F.Appx 1013, 1017 (Fed. Cir., Aug. 27, 2019). There, the Federal Circuit explained that the claim started with a broad category of “a memory,” and then proceeded “to a much more finite class of memory” called “the memory,” which was “organized into logical zones of one or more blocks for address translation.” *Id.* The use of antecedent basis (i.e., “the memory”) meant that the “broader list of memory at the outset of the claim has no bearing on this specific limitation.” *Id.* Instead, the term must be interpreted by “examin[ing] the claim in full and follow[ing] the antecedent basis” to correctly interpret the claim language. *Id.*

The same is true here. The use of antecedent basis (i.e., “the first reference data”) means that each recitation of “the first reference data” should be consistently interpreted to include “second selection instructions” within claim 1. Thus, the “first

reference data” must include the editing instructions and selection instructions, and those selection instructions must ultimately be transferred to the second MLA. To hold otherwise would improperly elevate form over substance by refusing to interpret “first reference data” consistently simply because its definition happens to occur at a wherein clause at the end of the claim instead of the beginning.

Second, RealD’s interpretation is supported by the ’985 specification and its expert. For example, as shown below, Figure 8 explains that “first reference data” is sent to the “second machine learning algorithm:”

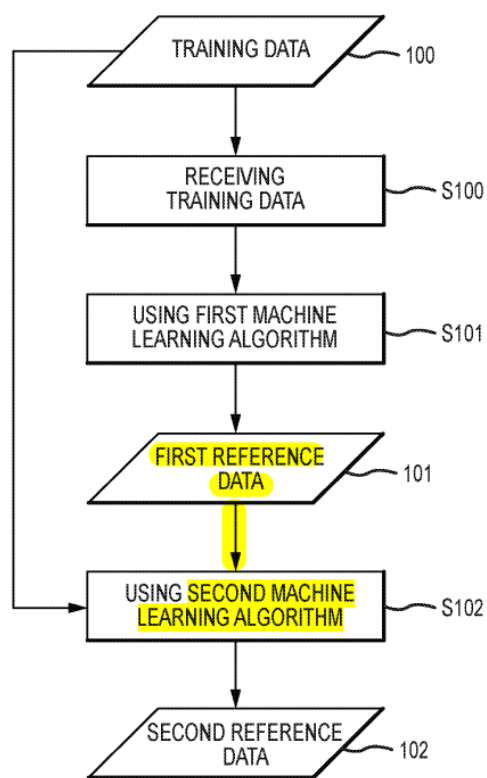


FIG.8

The ’985 Patent’s description of Figure 8 explains that, in one embodiment, “the first reference data 101 comprises first editing instructions . . . **and first selection instructions** . . . for a particular input patch.” EX-1001 at 15:1-11 (emphasis added). Thus, Figure 8 clearly shows an example of claim 1 where “first reference data 101,” including both first editing instructions and first selection instructions, are passed to the second MLA as indicated by the arrow leading to step S102.

Petitioner’s focus on a *different* figure (Figure 9) of a *different* embodiment,

and RealD’s expert testimony about that *different* figure, is irrelevant. *See* Reply at 20-21. Not every figure has to cover every embodiment; it is enough that a figure (Figure 8) and its related description provide sufficient written description and enablement of claim 1. *See, e.g., Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1354 (Fed. Cir. 2015) (holding that “the specification satisfies the written description requirement when the essence of the original disclosure conveys the necessary information—regardless of how it conveys such information, and regardless of whether the disclosure’s words are open to different interpretations.”).

Finally, there are no inconsistencies between elements 1[D] and 1[F] in terms of the claimed “first reference data.” They refer to the same “first reference data” as indicated by the use of antecedent basis as explained above. It is inconsequential that the later recitation of “first reference data” at 1[F] provides additional details of its contents that are not present in the earlier recitation at 1[D]. Indeed, if the “first reference data” recited in both 1[D] and 1[F] were identical, there would be no need to recite this portion of element 1[F] as it would be redundant.

As such, ’985 Patent claim 1 is not unpatentable in view of Chalom-Aslan.

V. CHALOM-ASLAN FAILS TO DISCLOSE A SECOND MLA THAT USES FIRST REFERENCE DATA.

Chalom-Aslan does not disclose a second MLA that uses the first MLA’s editing instructions. *See* Response at 30-34; *see also* EX-2008 at ¶¶ 104-120. Petitioner makes two arguments in Reply: (1) the Chalom-Aslan combination “was

a simple and routine matter” and (2) RealD allegedly “misrepresents Aslan’s objective function.” Reply at 23-26. RealD disagrees as explained below.

To begin, Petitioner failed to provide adequate explanation of its purported Chalom-Aslan combination. Response at 30-32. Petitioner first tries to shift the blame to RealD by alleging that the ’985 Patent omits similar descriptions, rendering its claims invalid for lack of enablement. *See* Reply at 23-24. Petitioner’s argument has no merit. The ’985 specification includes several examples of information passed between MLAs, including the specific format and content of the editing instructions. For example, the ’985 specification states that the editing instructions may include a displacement vector field F defined by the equation $O(x,y)=I(x+u(x,y),y+v(x,y))$ (EX-1001 at 8:57-62, 9:13-17); or they may include a filter field defined by the equation $L=\{k(P,x,y)\}$ with coefficients depending on the position (x,y) (*id.* at 9:13-25). The ’985 specification then explains that this information is passed from the first MLA to the second MLA. *See id.* at Figure 8; 14:59-62; 15:1-11. In one embodiment, the second MLA’s editing instructions are “principle component analysis components of a principle component analysis of the first editing instructions.” *Id.* at 15:64-66. Alternatively, the second editing instructions may be “wavelet components of the first editing instructions.” *Id.* at 16:3-7. Thus, in stark contrast to Petitioner’s lack of explanation about Chalom-Aslan, the ’985 Patent

provides ample detail about the information passed between MLAs, including the content of the editing instructions, and how the second MLA uses those instructions.

Petitioner then cites pages 44-47 and 58 of the Petition as containing a detailed explanation of the information passed between Chalom and Aslan and how that information is used. Yet, pages 44-45 only describe the motivation for combining Chalom and Aslan, not the details of the combination. And the remainder of pages 45-47 state that “a PHOSITA would have needed only to follow the instructions provided in Aslan” without any detail in terms of the actual data passed between MLAs and how it is used by the second MLA. Petition at 45-47. The single sentence on this issue is at page 58, and it states that “the teacher’s output, e.g., first editing instructions including motion vector fields, is used to train the student that also generates motion vector fields, i.e., second editing instructions.” *Id.* at 58. This parroting of the ’985 Patent claim language does nothing to clarify the actual contents of information is passed between MLAs and how the second MLA uses it. Nor does it cite to Chalom or Aslan to support this conclusory proposition. *Id.* Rather, Petitioner incorporates about 5 pages of its expert declaration at ¶¶ 269-272. *Id.* But Petitioner cannot circumvent the word limits by citing its expert report to “support conclusory statements for which the Petition does not otherwise provide an argument or explanation” and accordingly, Petitioner’s conclusory statements

should be given limited weight. *See, e.g., Cisco Sys. v. C-Cation Techs., LLC*, IPR2014-00454, 2014 WL 4352301, *6 (PTAB Aug. 29, 2014).

Regardless, this portion of the expert declaration suffers from all of the same issues explained above. It does not explain the actual contents of information passed between MLAs or how the second MLA would use or translate that information into something useful for its algorithm. For these reasons, Petitioner failed to adequately explain its combination such that a POSITA could understand and implement it.

Without any other information, a POSITA is left simply to “follow the instructions provided in Aslan” to implement the Chalom-Aslan combination—but Aslan’s teacher model passes the student an “objective function,” which is not the claimed first reference data. *See* Response at 32-33. In an effort to avoid this, Petitioner’s Reply argues that Aslan does not teach passing the objective function, and instead teaches passing the teacher’s motion vector fields. Reply at 26. Petitioner does not cite anything from Aslan or its expert to support this proposition. Instead, Petitioner relies on a sweeping five-page citation to the Petition at pages 54-59. However, nothing in those pages supports Petitioner’s reply argument. Pages 54-56 contain only a recitation of what Chalom—not Aslan—discloses. *See* Petition at 54-56. Page 57 contains only a recitation of how training data is passed to the teacher and student in Aslan; it says nothing about passing the teacher’s motion vector fields to the student, what is contained in the motion vector field, or how the second MLA

uses that information. *Id.* at 57. The single sentence on this issue is at page 58 of the Petition, and it fails for the same reasons noted above: it does nothing to clarify the actual contents of information is passed between MLAs and how the second MLA uses it; it cites no supporting evidence from Chalom or Aslan; and its incorporation of the expert declaration is both improper and unavailing. *See, e.g., Cisco*, IPR2014-00454, 2014 WL 4352301 at *6.

In sum, we are left only with Aslan’s instructions, which describe passing an objective function from teacher to student, not the claimed editing instructions for adjusting the digital representation of the head region. Thus, the Chalom-Aslan combination cannot render obvious a second MLA that uses “first editing instructions” as required by all of the independent claims and Ground III fails.

VI. CHALOM-ASLAN DOES NOT DISCLOSE FIRST AND SECOND REFERENCE DATA THAT ARE DIFFERENT FROM EACH OTHER.

As previously asserted by RealD, because the Chalom-Aslan combination uses the same inputs provided to the same models, they would return the same reference data (not different first and second reference data as required by the independent claims). *See* Response at 34-37. Petitioner disputes this conclusion, arguing that “the teacher and student models need not be the same and the inputs are not the same.” Reply at 27. However, rather than providing a supported explanation, Petitioner again points to large swaths of its Petition without details. Yet, the cited portions support RealD’s conclusions—not Petitioner’s.

The Petition explains that one way to combine Chalom and Aslan would result in a teacher random forest model and a student random forest model. *See* Petition at 44. Petitioner alleges that these models receive the same training data. *Id.* at 46 (alleging that “the same training data . . . are provided to both the teacher model and the student model”). As a result, this combination results in the same models receiving the same inputs. However, again, the outputs would also be the same for the same reason. EX-2008 at ¶ 135. This version of the Chalom-Aslan combination therefore does not teach or render obvious different first and second reference data as claimed in all of the independent claims. *Id.*

For all the reasons noted above, the Board should not find the challenged claims unpatentable under Ground III.

VII. THE DEPENDENT CLAIMS ARE NOT RENDERED OBVIOUS UNDER ANY OF THE GROUNDS RAISED BY PETITIONER.

Because neither Ganin nor Chalom-Aslan teach or disclose the elements of the independent claims, these references—and any further combinations based on these references—do not render the dependent claims obvious for the same reasons. The Board should therefore not find the dependent claims unpatentable under any of Grounds I – V.

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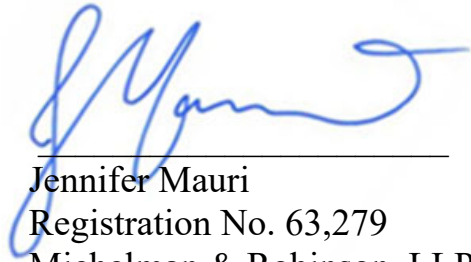
VIII. CONCLUSION

RealD respectfully requests that the Board find each of the challenged claims not unpatentable because Petitioner has failed to meet its burden on any of the Grounds.

Respectfully submitted,

Dated July 30, 2024

by:



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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24, I hereby certify that the above Patent Owner's Sur-reply of U.S. Patent No. 10,740,985 contains 5,297 words, excluding the parts exempted by 37 C.F.R. § 42.24(c), in compliance with the 5,600 word limit set forth in 37 C.F.R. § 42.24(c). This word count was prepared using Microsoft Word Office 365.

Respectfully submitted,

Dated: July 30, 2024

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CERTIFICATE OF SERVICE

A copy of Patent Owner's Patent Owner's Sur-reply of U.S. Patent No. 10,740,985 has been served on Petitioner via electronic mail at the following counsel of record for Petitioner:

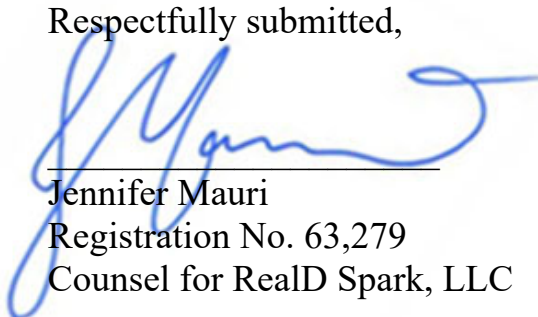
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