

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.,

Patent Owner.

CASE: IPR2023-01211

U.S. Patent No. 8,786,494

PATENT OWNER'S SUR-REPLY

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION.....	1
II. CLAIM CONSTRUCTION	1
A. Petitioner’s Arguments Confirm PO’s Construction.....	3
1. Petitioner’s Arguments Contradict Its Representations to The District Court	3
2. Evaluation Is Required	5
B. Petitioner’s “Single Calibration Point” Arguments Do Not Address Petitioner’s Construction	11
C. PO’s Construction Is Correct	12
D. Petitioner’s Indefiniteness Arguments Are Baseless	12
1. “Statistically Similar”.....	13
2. “Evaluation”.....	14
3. “Boundaries”	17
4. PO’s Construction Is Not Functional	17
III. CLAIMS 4 AND 26 ARE PATENTABLE	18
A. Ground 1: Claims 4 and 26 are Patentable Over Shkedi.....	18
B. Ground 2: Claims 4 and 26 are Patentable Over Shkedi and Spain.....	23
1. Spain Does Not Teach or Suggest NUGs	23
2. Petitioner’s New Obviousness Arguments Fail	25

C.	Ground 3: Claims 4 and 26 are Patentable Over Zhu	27
D.	Ground 4: Claims 4 and 26 are Patentable Over Zhu and Spain.....	31
E.	Ground 6: Claims 4 and 26 are Patentable Over Shkedi, Zhu, and Spain	31
F.	Intended Use	31
IV.	CONCLUSION.....	32

TABLE OF AUTHORITIES

Page(s)

Cases

<i>Halliburton Energy Services, Inc. v. M-I LLC</i> , 514 F.3d 1244 (Fed. Cir. 2008).....	18
<i>Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.</i> , 30 F.4th 1339 (Fed. Cir. 2022).....	13
<i>SAS Institute Inc. v. Iancu</i> , 138 S.Ct. 1348 (US 2008)	25
<i>Swinehart</i> , 439 F.2d 210 (C.C.P.A.)	18

Statutes

35 U.S.C. §112	13
35 U.S.C. §311	17
35 U.S.C. §312	25

Regulations

37 C.F.R. §42.51.....	4
37 C.F.R. §42.53.....	17

Patent Procedures

MPEP § 2173.....	13
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Exhibit List	
2001	Declaration of Christopher M. Gerson in Support of Patent Owner’s Motion for Pro Hac Vice Admission of Christopher M. Gerson Under 37 C.F.R. § 42.10(c)
2002	<i>Not Assigned</i>
2003	Memorandum Opinion on Google’s Motion for Judgment on the Pleadings on Patent Eligibility dated September 18, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2004	Memorandum Opinion on Apple’s Motion for Judgment on the Pleadings on Patent Eligibility dated September 18, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2005	Final Judgment dated October 6, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2006	Final Judgment dated October 5, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2007	Order dated June 26, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2008	Email from Saunak Desai to Stephen E. Noona, “Geoscope v. Google - Claim Narrowing” (June 12, 2023)
2009	Claim Construction Memorandum Opinion & Order dated July 19, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2010	Order dated June 26, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2011	Defendant Google LLC’s Final Invalidity Contentions dated July 3, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)

2012	Geoscope’s Opening Appeal Brief dated November 17, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC, Apple Inc.</i> , Case Nos. 24-1003 (Lead) 24-1018 (member) (Fed. Cir.)
2013-2016	<i>Not Assigned</i>
2017	Preliminary Identification of Asserted Claims dated March 27, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2018	Declaration of Saunak K. Desai in Support of Patent Owner’s Motion for Pro Hac Vice Admission of Christopher M. Gerson Under 37 C.F.R. § 42.10(c)
2019	<i>Not assigned</i>
2020	Declaration of Mark Alan Sturza
2021	<i>Curriculum Vitae</i> of Mark Alan Sturza
2022	Deposition Transcript of David Hilliard Williams for IPR2023-01212 (U.S. Pat. No. 8,406,753) (April 23, 2024)
2023	Deposition Transcript of David Hilliard Williams for IPR2023-01209, -01210, -01211 (U.S. Pat. Nos. 7,561,104, 8,786,494 and 8,400,358) (April 23, 2024)
2024	Patent Owner’s Statutory Disclaimer of Claims 1, 25, and 35 of the ’494 Patent

I. INTRODUCTION

Patent Owner (“PO”) proposes a construction of “[non-uniform] grid point” that further articulates the district court’s construction to better address issues raised by the specific prior art used in the Petition. PO’s construction is based on the intrinsic record, as well as the district court’s construction and related analysis.

Petitioner’s Reply opposes PO’s construction, contradicting not only the Markman order, but also Petitioner’s representations to the court to obtain its construction. Petitioner’s arguments against PO’s construction fail because they avoid addressing PO’s construction and mischaracterize the intrinsic and extrinsic evidence.

None of the prior art teaches NUGs under the appropriate construction because the prior art only teaches generating calibration data. That is, the prior art employs interpolation or extrapolation to estimate signal strength measurements—calibration data—against a pre-laid grid, not generate NUGs that define the grid. Accordingly, claims 4 and 26 are patentable.

II. CLAIM CONSTRUCTION

The district court construction of “grid point” and the intrinsic record both require construing “[non-uniform] grid point” as “a point associated with representative calibration data for an area whose boundaries are determined from

evaluation of the calibration data.” POR, 16-29. PO’s construction refines the district court’s construction of “a point associated with representative calibration data for an area.” EX1028 [Markman Order], 18-20.

In particular, PO’s construction gives meaning to the term “representative” which Petitioner’s arguments read out of the construction. The “area” of “representative calibration data” in the district court construction has a boundary and the boundary is determined from evaluating the calibration data. All areas have boundaries and NUGs have different areas with different boundaries. POR, 5-11. In order to obtain “representative calibration data of an area,” the calibration data within the area must be evaluated such that each area comprises “representative calibration data” for that area. *Id.*

The district court correctly summarized Petitioner’s Markman arguments, stating “Defendants’ use of ‘representative calibration data’ is intended to reflect that the defining characteristic of a NUG region [] is that the data points within an area are all ‘statistically very similar’ such that each of the grid points within the NUG region can represent the overall NUG.” EX1028 [Markman Order], 20. But, unlike the prior art, where calibration data is assigned to predetermined areas or grids, the ’104 Patent and related patents teach that NUGs are determined based on areas that have *representative* calibration data for an area. EX1018 [’104 Patent], 3:50-52;

3:56-57. Thus, an evaluation of the calibration data must occur to determine how to assign calibration points to NUGs.

A. Petitioner’s Arguments Confirm PO’s Construction

1. Petitioner’s Arguments Contradict Its Representations to The District Court

Petitioner argues that evaluating the statistical similarity of calibration points “is clearly not legally supported by the file history.” Reply, 6. Petitioner is wrong. First, PO’s construction does not require evaluating statistical similarity. *Infra*, §II.A.2. The POR quote Petitioner cites is limited to the embodiments discussed directly before the quotation. POR, 10. It does not limit all evaluations of calibration points to analysis of statistical similarity.

Second, Petitioner told the district court the *opposite* of what it now argues. Petitioner argued that “*the essence of a ‘grid point’*” is that “[t]he claimed *grid points represent an area for which calibration data is sufficiently similar* that they can be represented by a single point for the entire area.” IPR2023-01210, EX1025 [Google Claim Construction Brief], 15 (emphasis added).¹ Petitioner was clear that

¹ Petitioner did not submit its Claim Construction Brief as an exhibit in this IPR or serve it on PO as required for inconsistent statements under rule 37 C.F.R.

(continued...)

NUGs are, “by definition,” statistically similar to the calibration points within the NUG:

- “the described system stores only one point for a given NUG, because *the NUG represents an area for which all of the points within it would be similar if measured*, so each point is representative of the area” (*id.*, 16);
- “Once the NUG is defined, the system can store a single point within the NUG *because that point is, by definition, representative of (i.e., statistically similar to) the other points within the NUG*” (*id.*, 17);
- “Thus, the intrinsic record repeatedly confirms that a grid point is a point that represents calibration data across an area (*i.e., an area over which calibration data is sufficiently similar*).” *Id.*, 17.

All emphasis added. Importantly, Petitioner defined “representative of” as “i.e., statistically similar.” *Id.*, 17.

§42.51(b)(iii). Nonetheless, it was filed as EX1025 in IPR2023-01210 and IPR2023-01212 that involve substantially the same issues as this IPR. Per the Board’s authorization, PO has filed an unopposed motion to add EX1025 to the record as an exhibit in this IPR. PO requests the Board take judicial notice of EX1025 and add EX1025 to the record in this IPR.

Moreover, Petitioner agreed that a grid point's area requires defined boundaries, stating "[t]hat natural obstacles can form a grid point boundary further confirms that *the grid point represents an area with defined boundaries.*" *Id.*, 16.

The district court adopted Petitioner's construction, stating "Defendants' use of 'representative calibration data' is intended to reflect that the defining characteristic of a NUG region [] is that the data points within an area are all 'statistically very similar' such that each of the grid points within the NUG region can represent the overall NUG." EX1028 [Markman Order], 20.

The Board should hold Petitioner to the unqualified representations it made to the district court and adopt PO's construction.

2. Evaluation Is Required

Petitioner complains that "the District Court's final claim construction of 'grid point' makes no mention of any 'evaluation.'" Reply, 5-6. PO's current construction was not before the district court, thus the issues addressed in the Markman order were different. Moreover, the district court claim construction agrees that "calibration data" must be "analyzed" to determine NUGS. EX1028 [Markman Order], 19. Petitioner's reply argues—and PO agrees—that there is no relevant difference in "evaluation" and "analysis" for purposes of this IPR. Reply, 4.

Further, Petitioner's Markman Briefing that grid points are generated by evaluating calibration data, stating NUGs are formed when "[n]earby points are evaluated for 'statistical sufficiency' to determine whether they are 'statistically [] similar' such that they should be part of the same NUG, or instead part of a different NUG." IPR2023-01210, EX1025, 17. Thus, the district court agreed with Petitioner that NUGs are formed by evaluating calibration data. *Id.*

Petitioner argues that "[t]he '753 Patent expressly discloses many ways for generating a grid point associated with representative calibration data for an area" Reply, 6 (citing EX1008, 10:29-59, 12:15-25 and 12:58-67). Consistent with PO's construction, Petitioner cites passages where the grid point represents an area whose boundaries are determined from evaluation of the calibration data. *Id.*, 10:47-50; 12:15-25.

Petitioner argues "[o]ne or more signal strengths measured at a point, without further evaluation, can thus serve as representative calibration data for a grid point." Reply, 7. While PO agrees that a NUG can be formed from one or more signal strengths measured at a point, even NUGs consisting of a single calibration point are formed based on evaluation of calibration data at neighboring points. The '753 Patent clearly explains this. EX1008 ['753 Patent], 10:59-65. Not only does the "NUG Generator [] evaluate the data vectors at a particular (candidate) calibration

point” (*id.*, 10:39-41), it evaluates “[a]ll adjacent calibration data points” “with respect to the first considered calibration point.” *Id.*, 10:59-61. As a result, the “adjacent calibration points” can be “aggregated to the former calibration point” if they exhibit “tight clustering.” (*id.*, 10:47-50). At one extreme, if all adjacent calibration points exhibit tight clustering, they may “wind up having all their data accumulated into a single NUG.” *Id.*, 10:61-63. “[A]t the other extreme, each such calibration point may become the root of a separate NUG.” *Id.*, 10:63-65. Thus, even in the “extreme” case where a NUG consists of a single calibration point, it has still been evaluated against all adjacent calibration points.

Petitioner argues that “[t]he ’494 Patent confirms grid points can also be determined from collected calibration data without evaluation.” Reply, 7. A NUG “represents the signal characteristics and/or calibration data over a given region.” EX1001 [’494 Patent], 3:59-61. The NUG is *representative* of the calibration data in a given region, it is not the calibration data. Evaluation of calibration data is necessary to generate the NUG.

The ’753 Patent clarifies this distinction, stating “for each of the calibration points the associated calibration data is evaluated and based on that evaluation a determination is made as to whether at least one grid point should be defined.”

EX1008 [’753 Patent], 2:56-59. *See also id.*, 3:5-9, 3:16-19. Thus, the determination of whether to create a NUG is ***based on*** the evaluation.

Petitioner cites its expert’s deposition to argue that “[Determining a grid point] would not require analysis. It could be just the actual measurements....” Reply, 7. While the expert was asked about *determining a grid point*, he limited his response to the construction for *calibration data*:

10	Q	To determine which of that calibration data
11		is representative of an area would require analyzing
12		that set of collected calibration data, right?
13	MR. LEE:	Objection. Form. Scope.
14		Relevance.
15	THE WITNESS:	It would not require
16		analysis. It could be just the actual measurements,
17		and I believe that is an issue as part of the
18		calibration data construction, it being as:
19		"modified or unmodified network measurement data
20		associated with a geographical [sic] location."

EX2023 [Williams Dep. Tr.], 37:10-20. *Id.*, 39:3-11; *See generally id.*, 37:10-40:10. By limiting his responses to the construction of calibration data, Mr. Williams avoided responding to the question of whether NUGs are determined “based on” an

“evaluation” or “analysis” of the calibration data. EX1008 [’753 Patent], 2:56-59.

Mr. Williams’ testimony is therefore not instructive.

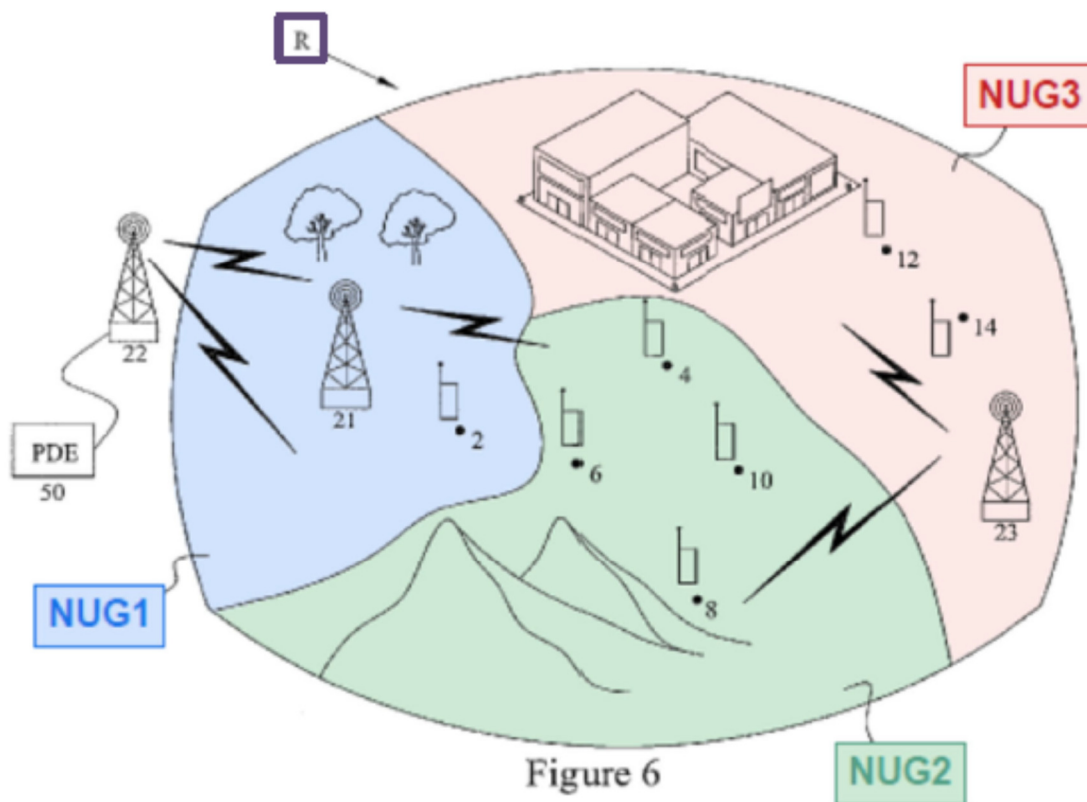
Petitioner argues that “[t]he terms ‘evaluation’, ‘statistically very similar’ data, and ‘boundaries of an area’” are only embodiments of the ’753 Patent. Reply, 7. Petitioner provides no intrinsic analysis or evidentiary support that “evaluation” and “boundaries of an area” are optional for NUGs. Reply, 7-9. Indeed, the district court’s construction of “a point associated with representative calibration data for an area” **requires** boundaries because “the grid point represents an *area* with defined boundaries.”) (emphasis in original). IPR2023-01210, EX1025, 16 *See generally id.*, 15-17.

Instead, Petitioner focuses on “statistical similarity,” arguing that the ’379 Provisional “expressly discloses generating grid points and NUGs that are not based on statistical consistency/similarity of data.” Reply, 7-9. Petitioner’s Markman brief argued the opposite, characterizing statistical similarity as “the essence of a ‘grid point.’” *Supra*, §II.A.1. *See also* EX1028 [Markman Order], 20.

Moreover, PO’s construction does not mention or require statistical similarity. POR, 17. Instead, PO’s construction tracks the Markman order, which characterized the evaluation (or analysis) of calibration data as “what *must be done* to arrive at a

grid point or set of grid points.” EX1028 [Markman Order], 19 (quoting EX1008 [’753 Patent], Abstract) (emphasis in original).

Petitioner argues that ’784 Patent Figure 6 only illustrates exemplary NUGs. Reply, 9. Figure 6 (below) illustrates NUGs have different shapes, sizes and boundaries depending on the representative calibration data for different areas. NUGS are not uniformly assigned to a pre-defined grid.



EX2013 [’784 Patent], Fig. 6; *see also* IPR2023-01210, EX1025, 15-17.

Petitioner argues that “Mr. Sturza was also unable to confirm whether boundaries are even stored pursuant to the teachings of the ’753 Patent.” Reply, 8-9. Nothing in PO’s construction requires the boundaries to be stored in any particular manner.

B. Petitioner’s “Single Calibration Point” Arguments Do Not Address Petitioner’s Construction

Petitioner argues that a NUG can consist of a single calibration point. Reply, 9-11. PO’s construction does not require a specific number of calibration points.

Petitioner argues that the district court’s Markman order “confirmed calibration data can be a single calibration point.” Reply, 10 (citing EX1028 [Markman Order], 20) (emphasis in original). Nothing at page 20 addresses “a single calibration point.” Instead, the Markman order found that “Defendants’ use of ‘representative calibration data’ is intended to reflect that the defining characteristic of a NUG region [] is that the data points within an area are all ‘statistically very similar’ such that each of the grid points within the NUG region can represent the overall NUG.” *Id.* The court’s statement holds true whether a NUG is comprised of one data point (e.g., the first data point forms the root of its own NUG) or composed of many data points with statistical similarities. PO’s construction reflects this without limiting NUGs to the preferred embodiments.

C. PO's Construction Is Correct

Petitioner complains that PO “cites to portions of the specification of the ’494 Patent that comport with the current construction of ‘grid point’ and do not mention anything about ‘evaluation’ or ‘analysis.’” Reply, 11. Petitioner misrepresents the record. The POR quotes the ’379 Provisional statement that “[t]he *evaluation* of the [calibration] data vectors is of great importance since it is fundamental to the method’ of generating the claimed grid points.” POR, 27 (*quoting* EX1005 [’379 Provisional], 6) (emphasis added). *See generally* POR, 27-29. The ’379 Provisional explains the evaluation process is “of great importance since it is fundamental to the method.” EX1005 [’379 Provisional], 6. Thus, the specification is clear that each NUG “represent[s] an area of collected calibration data” (Reply, 12) because the “NUG generator evaluates the [calibration] data vectors” such that the generated NUGs cover comprises representative (e.g., statistically similar) calibration data in a region. *Id.*

Accordingly, PO’s construction is correct.

D. Petitioner’s Indefiniteness Arguments Are Baseless

Petitioner argues that the terms “evaluation,” “statistical very similar” and “boundaries” are “ambiguous and indefinite.” Reply, 12-14. To the contrary, Petitioner’s Markman brief argued that grid points are determined by evaluating the

statistical similarities of calibration points in order to determine NUG areas with defined boundaries. *See supra*, §II.A.1. Petitioner’s new indefiniteness arguments contradict those arguments and the resulting Markman order.

Moreover, Petitioner’s indefiniteness arguments fail for the reasons described below.

1. “Statistically Similar”

The term “statistically similar” is not used in the claims or in PO’s construction. *Supra*, §II.A.2. Thus, Petitioner’s argument fails, as indefiniteness applies only to *claim* language. *See* 35 U.S.C. §112(b) (“one or more claims particularly pointing out and distinctly claiming the subject matter ...); MPEP § 2173 (“the claim language must be ‘definite’ to comply with 35 U.S.C. 112(b)”).

Moreover, “examples in the written description help [] provide sufficient guidance to render the claims not invalid as indefinite.” *Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1349-50 (Fed. Cir. 2022). The specification provides many examples, describing how the “‘statistical similarity’ of calibration data is evaluated to generate a grid point.” POR, 27; *see generally*, POR, 27-29; EX2020 [Sturza Decl.], ¶89-90; EX1005 [’379 Provisional], 6. Thus, the intrinsic record provides written description support for evaluating statistical similarity.

2. “Evaluation”

The district court rejected indefiniteness arguments from Petitioner with respect to the “evaluating” limitation in the claims of ’753 Patent, instead applying the plain and ordinary meaning of the term. EX1028 [Markman Order], 21-23. The district court held that the intrinsic record “provide[s] a POSA with specific examples of what the ‘evaluating’ step might encompass.” *Id.*, 22. The same is true for claims 4 and 26—the intrinsic record not only explains how the NUG generator can evaluate calibration data based on statistical similarity (*supra*, §II.A.2), it provides examples of how NUGs can be evaluated “based not on statistical consistency but on other conditions.” EX1005 [’379 Provisional], 8. *See generally id.*, 5-8.

Petitioner ignores the intrinsic record. Instead, Petitioner misrepresents Mr. Sturza’s deposition testimony to imply that “evaluation” is indefinite. Reply, 13. Mr. Sturza testified (consistent with his declaration, the intrinsic record, and Petitioner’s Markman briefing) that the specification provides examples of how the evaluation can take place:

19 Q. How is the evaluation performed?

20 A. I don't believe I provided an opinion as to
21 any specific form for evaluation. You know, as we have
22 been discussing, you know, from the record, you know,
23 there are several examples of using statistical
24 similarity with examples of algorithms for, you know,
25 determining statistical similarity.

EX1031 [Sturza Dep. Tr.], 83:19-25. *See generally* EX2020 [Sturza Decl.], ¶¶89-90; EX1005 ['379 Provisional], 6; IPR2023-01210, EX1025, 17.

The quotes Petitioner cites, on the other hand, were responses to improper questions about Petitioner's district court §101 arguments:

10 Q. Can the evaluation be performed by a human?

11 A. Again, it's not, you know, something I've
12 thought about. You know, I would -- I would need to
13 look at the, you know, record again on that. I don't --
14 you know, I don't have an opinion on that, no.

15 Q. Can the evaluation be performed as purely --
16 as a pure mental process?

17 ATTORNEY McBRIDE: Objection. Form. Scope.

18 A. Well, you know, I'm not sure what does a pure
19 mental process means. But again, it's not something
20 that I've, you know, provided an opinion on or thought
21 about.

EX1031 [Sturza Dep. Tr.], 84:10-21.

2 Q. If the evaluation cannot be performed by a
3 human or a computer, how would the evaluation be
4 performed?

5 A. You know, I've provided, you know, no opinion
6 on how the evaluation could be performed. I don't
7 know -- you know, I -- I really can't provide an answer
8 to that without, you know, doing the work.

EX1031 [Sturza Dep. Tr.], 87:2-8; *see id.*, 83:19-87:15. Questions about “performed by a human,” “part of a mental process,” and “performed by a computer” are directed to the §101 motion in the district court. These are legal concepts outside the scope

of Mr. Sturza's testimony and role as an expert. *Id.*, 84:18-19. As such, Petitioner's argument is not relevant to an indefiniteness analysis or a cross examination of Mr. Sturza.

Further, because §101 is outside the scope of a cross examination on Mr. Sturza's declaration (37 C.F.R. §42.53(d)(5)(D)(ii)) and outside the statutory scope of issues to be decided in an IPR (35 U.S.C. §311(b)), the Board should strike the entire improper line of *Alice* questioning from EX1031, 84:1-87:15.

3. "Boundaries"

Petitioner provides no support for its contention that the term "boundaries" is indefinite. Reply, 12-14. Every area has a boundary. *Supra*, §II. Moreover, the intrinsic record explains how to generate NUG boundaries. EX1001 ['494 Patent], 4:10-5. Boundary is not indefinite, since "the grid point represents an area with defined boundaries." IPR2023-01210, EX1025, 16.

4. PO's Construction Is Not Functional

Petitioner advances a new argument that PO's construction is functional and therefore indefinite. Reply, 14. First, the construction is not functional. PO's construction reflects the "defining characteristic" and "essence" of a NUG, not what a NUG *does*. *Halliburton Energy Services, Inc. v. M-I LLC*, 514 F.3d 1244, 1255

(Fed. Cir. 2008) (functional limitations are “defined ‘by what it does rather than what it is.’”). PO’s construction does not define the functions a NUG performs.

Nor is PO’s construction “ambiguous.” *Supra*, §§II.D.1-3. And, while PO’s construction is not functional, “there is nothing intrinsically wrong with” using functional language in claims, unless the functional language fails “to provide a clear-cut indication of the scope of subject matter embraced by the claim.” *Swinehart*, 439 F.2d 210, 212–13 (C.C.P.A.). The intrinsic record provides a detailed description of how NUGs are determined based on an evaluation of calibration data. *Supra*, §§II.A, C.

III. CLAIMS 4 AND 26 ARE PATENTABLE

A. Ground 1: Claims 4 and 26 are Patentable Over Shkedi

Petitioner relies on Shkedi’s comparison of received signal strengths to previously-stored received signal strengths to determine location:

Simply stated, if a mobile telephone (at a user selected location) measures a plurality of service antenna signals and stores these with their respective service antenna identifications, then that mobile telephone (or an equivalent unit) upon observing an identical list of service antennas with substantially identical respective signal strengths—can reasonably conclude that it is within a predetermined proximity of the original user selected location.

EX1006 [Shkedi], 8:41-48; Reply, 15-16. Stored signal strength is calibration data. It is not a NUG because it does not represent the calibration data for an area and it is not generated based on evaluation of the measured calibration data. POR, 31-34. If the mobile later receives identical signal strengths, the mobile assumes it is within a “predetermined proximity” of the stored signal. *Id.*, 31-32. Every other location within the same predetermined proximity might have a different signal strength. That is because the “predetermined proximity” is an assumption made by the mobile, not an evaluation that is stored with the stored signal strengths. That is, if the mobile receives a signal strength that is identical to a stored signal strength it will assume that it is within a certain distance of the stored signal strength. That does not mean that the stored signal is representative of all calibration data within the predetermined proximity.

Petitioner argues that Shkedi’s stored “signal strengths are calibration data ‘representative’ of the area formed by the ‘predetermined proximity’” (Reply, 15) but the stored signal strengths don’t represent an area—they represent a coordinate. EX1006 [Shkedi], 13:11-12 (“the Registering step includes accessing a GPS location coordinate for the selected location ...”). For example, a mobile might assume a “predetermined proximity” of 25 meters, but there could be a location 5 meters away from the stored signal strength with a very different signal strength. The second

location is within the mobile's "predetermined proximity," but the stored signal strength is not representative of the second location.

Petitioner argues that the locations in Shkedi are "non-uniformly spaced, user-selected points (i.e., not predefined)" (Reply, 16), but Shkedi does not address whether selected locations are uniform or not and the proximities *are predefined* because they are "predetermined proximities." EX1006 [Shkedi], 8:41-46. Thus, even though the predetermined proximity does not represent a specific area, the same uniformed predefined proximity is applied by the mobile phone to all stored signal strengths. POR, 31-33; EX1006 [Shkedi], 8:39-48.

Petitioner argues that Shkedi's "transformational data bank" generates "extrapolated locations" that "constitute non-uniform grid points generated based on "evaluation" (*e.g.*, extrapolation) of collected calibration data. Reply, 16. Petitioner confuses Shkedi. Shkedi's "locations" are defined by "GPS (latitude longitude) coordinates." *Id.*; EX1006 [Shkedi], 13:14-18. Coordinates are not areas and do not have boundaries. The "extrapolated locations" are "never registered locations" *Id.*, 13:15-25. These extrapolated locations are assigned coordinates and an estimated signal strength. They do not have an area or boundaries and are not disclosed as stored in a database.

Petitioner argues that Shkedi discloses boundaries of the area (Reply, 17), but nothing at Shkedi 17:43-45 discloses anything related to boundaries, let alone determining areas of representative data. EX1006 [Shkedi], 17:43-47. This passage discusses estimating GPS coordinates by when the actual measured GPS coordinates are unavailable. The cited passage has nothing to do with using calibration data to determine areas or boundaries for NUGs.

Petitioner argues that Shkedi's "user selected location[s]" are stored in the database such that the mobile telephone can be located "within a predetermined proximity of the original user selected location." Reply, 12-13. As discussed above, "user selected locations" comprises signal measurements and a GPS coordinate. *See also* EX1006 [Shkedi], 13:12-14. A GPS coordinate is not an area, and the predetermined proximity is not an area, much less a non-uniform area with boundaries. Further, a "predetermined proximity" is an assumption made by the *mobile* that the mobile is within a certain distance from a stored location; the stored locations are not associated with any particular proximity. POR, 38-39.

Petitioner argues that Shkedi's user selected locations are "random locations," but this is irrelevant. POR, 37-39. Shkedi's locations are not "associated with representative calibration data for an area," much less "for an area whose boundaries are determined from evaluation of the calibration data." Stated differently, Shkedi's

predetermined proximity is an assumption that the mobile is within a certain distance of a user selected location. It does not indicate anything about the area around the user selected location.

Petitioner argues that “Shkedi discloses generating new points (e.g., by extrapolation) as one or more nonuniform grid points.” Reply, 18. Petitioner’s argument mischaracterizes Shkedi. Shkedi is extrapolating new calibration points in “never registered locations.” EX1006 [Shkedi], 13:15-23; POR, 38-39. That is, Shkedi estimates the values of the signal strengths at never registered locations based on measured signal strengths at nearby locations. It is not associating a grid point with representative calibration data for an area, much less determining boundaries for the area.

Petitioner argues that Shkedi’s “never registered locations” are stored in a database. Reply, 18. Nothing in Shkedi supports Petitioner’s assertion. Shkedi’s “transformational data bank” is comprised of known GPS and antenna space reception coordinates—that is, data at known locations. EX1006 [Shkedi], 13:14-25. The database extrapolates the antenna space reception coordinates to estimate a location for an unknown, or never registered, location. *Id.* The fact that this extrapolation is done for E-911 purposes emphasizes it is done when the user needs to determine their current location and is not already stored. *Id.*

Accordingly, Shkedi does not disclose the claimed NUGs.

B. Ground 2: Claims 4 and 26 are Patentable Over Shkedi and Spain

1. Spain Does Not Teach or Suggest NUGs

Petitioner argues that PO's "construction does not foreclose generating 'grid points' at 'predetermined locations.'" Reply, 20-21. PO's argument is that Spain's grid points are not disclosed as non-uniform, as having different shapes or sizes, or as based on evaluation of calibration data. POR, 40-42. Petitioner fails to meaningfully address these arguments because the system in Spain is fundamentally different than the '494 Patent.

Petitioner argues that "Spain expressly distinguishes interpolated points from the 'predetermined locations.'" Reply, 20-21 (quoting EX1009 [Spain], [0101]). This distinction is meaningless. Spain describes "interpolat[ing] the fingerprints at all locations in between the sampled locations." EX1009 [Spain], [0101]; POR, 41. Thus, Spain teaches a uniform grid of calibration points where some grid points are measurements, and some are interpolated estimates. *Id.*, 41-42.

Petitioner argues that NUGs can encompass interpolated grid points. Reply, 21. Again, this argument is irrelevant. Spain's grid points are calibration points. Reply, 22 ("grid point (i.e., fingerprint)"); 21 ("fingerprint (i.e., calibration data ...)"). Spain does not teach that its grid points—interpolated or measured—are

associated with representative calibration data for an area whose boundaries are determined from evaluation of the calibration data. The grid points may be assigned to a “small area,” but the grid points are not representative of the calibration data for the small area. Spain Fig. 10 below, illustrates this:

501

Fingerprint Database					
No.	Lat.	Long.	Time	Fingerprint	Description
1					
2					
3					
4					
5					
6					
...					
L					

EX1009 [Spain], Fig. 10. There is no disclosure of any area, any boundaries for the area, or whether the fingerprint is representative of the calibration data in the area. To the extent the fingerprint is associated with a “small area,” “the Lat and Long fields in [Fig. 10] indicate a position inside the area, preferably the center point.” EX1009 [Spain], [0099]. Spain is silent on how this area would be determined because Spain is a fundamentally different system than the ’494 Patent.

Petitioner's discussion of arbitrary "potentially ambiguous locations" (Reply, 21) is likewise irrelevant to NUGs. Spain [0009] is discussing how it determines the mobile location by eliminating locations from consideration if they are ambiguous. EX1009 [Spain], [0005]-[0010]. Spain [0009] is not discussing how the fingerprint database is created.

Similarly, the other portions of Spain Petitioner cites are discussing generating new fingerprints (i.e., new calibration data) when existing fingerprints are ambiguous. Reply, 21-22; EX1009 [Spain], [0055], [0101]. They are not generating NUGs, they are generating a "new grid" of calibration data "to replace the old one." EX1009 [Spain], [0055].

2. Petitioner's New Obviousness Arguments Fail

Petitioner argues that both Spain and Shkedi "address the same problem of inaccurate mobile locations determination due to degraded GPS signals." Reply, 19. This is the same generic rationale the POR identified as insufficient. POR, 42-44.

Petitioner provides new arguments and citations to Spain and Shkedi. Reply, 19-20. These arguments were not in the Petition and should therefore be disregarded. *SAS Institute Inc. v. Iancu*, 138 S.Ct. 1348 (US 2008) ("in an inter partes review the petitioner is master of its complaint"); 35 U.S.C. §312 (petition must identify "with particularity ... the grounds on which the challenge to each claim is based").

Petitioner's arguments regarding fingerprint topological maps and providing lower and higher accuracy monitoring methods (Reply, 19-20) are new arguments that should be disregarded.

Moreover, Spain paragraphs [0089]-[0094] do not discuss "lower/higher accuracy methods" of monitoring activity. Reply, 19-20, EX1009 [Spain], [0089]-[0094]. Instead, they discuss Spain Fig. 12, a flowchart showing Spain's method of reducing the number of locations that need to be searched. EX1009 [Spain], [0076], Fig. 2. These paragraphs describe how Spain arrives at a search area for its search process by eliminating areas that cannot be the correct location for the mobile.

Petitioner argues "Spain's 'learning/training fingerprint techniques' are applicable to Shkedi's fingerprint database." Reply, 20. Shkedi already discloses a method for extrapolating stored signal strengths to estimate the signal strengths at locations that have not been stored. EX1006 [Shkedi], 13:13-25. Likewise, Shkedi already teaches having the "cell phone record [i.e., store] signal strengths at different times of day at different days of the week." EX1006 [Shkedi], 20:19-32. Notably, this embodiment of Shkedi is disfavored. *Id.*, 20:33-37. Petitioner does not explain how Spain's teachings are different or would improve on a teaching already disfavored by Shkedi.

Petitioner does not explain how Spain would improve upon the “robustness of [Shkedi’s] electronically stored measurements.” Reply, 20. Shkedi 12:59-67 discusses improving robustness by storing additional measurements from the mobile device’s monitoring step. *See id.*, 11:57-60. Using Spain to estimate additional locations decreases Shkedi’s robustness because Spain’s “learning/fingerprint techniques” are estimating measurement values that are less reliable than actual measurement data. Thus, Spain’s measurements are less robust and reliable.

Accordingly, the Reply’s new motivation to combine arguments fail.

C. Ground 3: Claims 4 and 26 are Patentable Over Zhu

The points in Zhu’s grid are “calibration points,” not NUGs. POR, 44-45. Petitioner argues that “a calibration point can be allocated to a single non-uniform grid point.” Reply, 23. Zhu does not disclose how the measured points are allocated to NUGs, associated with representative calibration data for an area or how the boundaries are determined from evaluation of the calibration data; Petitioner simply assumes every point in Zhu is a NUG.

Petitioner’s argument is that “Zhu’s ‘interpolation points’ and ‘modeled points’ constitute ‘non-uniform grid points’”. Reply, 23. The Reply does not identify how these points are associated with representative calibration data for an area. The

“interpolation” and “modeled points” are just points that reflect estimated signal strength—that is, estimated calibration data—at a particular location.

Petitioner confuses Zhu Figure 2. Reply, 23-24. In Zhu Fig. 2 (below), each square in the grids represents a 10m square raster point. EX1010 [Zhu], 94; POR, 45-46. The measured points represent an actual measurement within each 10m square. The interpolated and modeled points (center and right, respectively) represent estimated measurements for the 10m squares that do not have measured data:

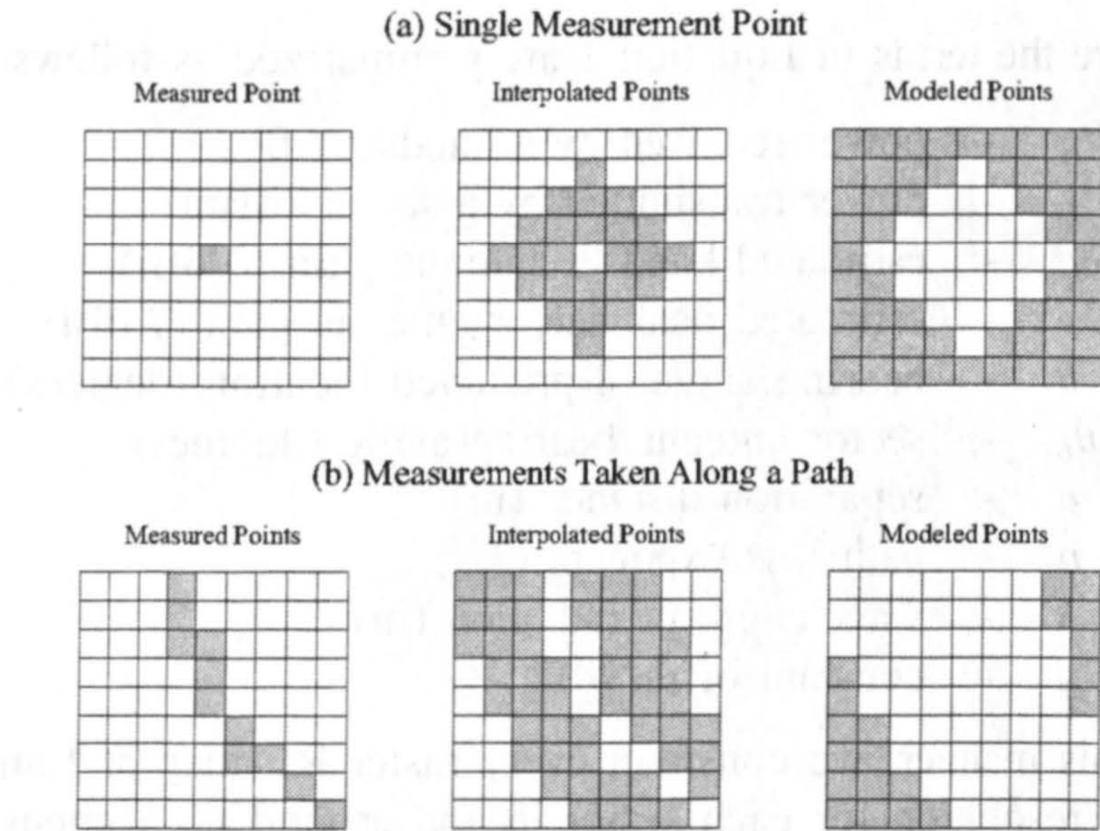


Fig. 2. Marked raster regions (in gray) for (a) a single measurement and (b) a path of measurements.

Notably, Zhu assigns a signal strength—whether measured, interpolated, or modeled—to every square. *Id.* While the measured points happen to cluster along the measurement paths (e.g., roads), they are not clustered together based on an evaluation—they are clustered along a path because the drive test collects data along the road. calibration data is still estimated for every other square in the grid.

Petitioner argues that “Zhu’s ‘interpolated’ and ‘modeled’ points are obtained from evaluation of calibration data to determine the boundaries of the area represented by the grid points.” Reply, 23-24. There is no evaluation to determine boundaries. Every grid point in Zhu is assigned a 10m square. EX1010 [Zhu], 93-94.

Petitioner implies that “the collective gray areas in Figure 2” are NUGs. Reply, 23-24. This is incorrect. The gray areas in each figure indicate which area of the grid consists of measured, interpolated, or modeled data, respectively. They don’t indicate that the calibration data across all grey squares is representative of the entire area. Each square can have different values. Zhu has no concept of aggregating the data between different squares to arrive at NUGs.

Petitioner argues that in improbable situations, NUGs may have uniform boundaries. Reply, 24. But Zhu lacks any concept of NUG formation. There is no evaluation of calibration data—signal strengths (i.e., calibration data) are either measured or estimated and then automatically assigned to a 10m square. EX1010 [Zhu], 93-94. Zhu does not evaluate signal strength, determine whether the signal strength is representative of the entire 10m square, or determine what the boundaries of the area are, it simply assigns the signal strength to a square.

Accordingly, Zhu does not disclose NUGs.

D. Ground 4: Claims 4 and 26 are Patentable Over Zhu and Spain

As with Ground 2, the Reply introduces a new motivation to combine Ground 4 that should be rejected as untimely. Reply, 24-25 (discussing interpolation). In addition, for the reasons discussed above and in the POR, Ground 4 fails to show Claims 4 and 26 are obvious. POR, 47.

E. Ground 6: Claims 4 and 26 are Patentable Over Shkedi, Zhu, and Spain

Ground 6 fails for the reasons discussed above for Shkedi, Zhu and Spain individually. Specifically, none of the references teach [non-uniform] grid points. The Reply argues that “the Petition explains how Shkedi would have been modified in view of Zhu and Spain” (Reply, 25) but none of the citations it provides explain how Shkedi, Zhu and Spain would be combined. Only page 57 of the Petition is related to ground 6, but it only states that “[t]o the extent Shkedi’s disclosure is deemed not to expressly reference ‘non-uniform grid points’, it would have been obvious to include such points in Shkedi’s database” as taught by Spain. *Id.* There is no discussion of how Spain’s teachings of grid points would be incorporated into Shkedi to teach NUGs or how Zhu applies.

F. Intended Use

The Reply argues for the first time that claims 4 and 26 are an impermissible intended use. Reply, 15. Claims 4 and 26 narrow claims 1 and 25 by adding the novel

limitation of “calibration data for one or more non-uniform grid points within said region.” EX1001 [’494 Patent], cls. 4 and 26. It is not an intended use (e.g., determining location), it is a new method to perform the claimed location determination. Petitioner provides no support that a narrowing dependent claim is not separately patentable because it uses the term “for.” *Id.* Claims 4 and 26 are not an intended use.

IV. CONCLUSION

For the reasons above, PO respectfully requests that the Board find challenged claims 4 and 26 patentable.

Date: October 23, 2024

Respectfully submitted,

/ Stephen McBride /

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CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner's Sur-Reply (the "Sur-Reply") consists of 5,456 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The Sur-Reply complies with the type-volume limitation of 5,600 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

Respectfully submitted,

/ Stephen McBride /

Date: October 23, 2024

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the following document was served by electronic service, by agreement between the parties, on the date below:

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