

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Martin Alles et al.
U.S. Patent No.: 8,406,753 Attorney Docket No.: 50095-0140IP1
Issue Date: March 26, 2013
Appl. Serial No.: 12/026,480
Filing Date: October 20, 2014

Title: SYSTEM AND METHOD TO COLLECT AND MODIFY
CALIBRATION DATA

SUPPLEMENTAL DECLARATION OF KARTHIK SUNDARESAN

I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code.

Dated: 11/15/2024

By: 

Karthikeyan Sundaresan, Ph.D.

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I, Karthikeyan Sundaresan of Atlanta, GA, declare that:

I. INTRODUCTION

1. I have been retained on behalf of Apple Inc. (“Apple”), as an independent expert consultant in this *inter partes* review (“IPR”) proceeding before the Patent Trial and Appeal Board (“PTAB”) of the United States Patent and Trademark Office (“USPTO”). I understand that the proceeding number of this IPR proceeding is IPR2024-00259.

2. I have been asked by Apple’s counsel (“Counsel”) to consider whether certain references describe or make obvious features recited in claims 1, 7, 9, 32, 38, and 40 of U.S. Patent No. 8,406,753 (“the ’753 patent”) (APPLE-1001). My opinions are based on my education, my knowledge and experience in the relevant fields of technology, and my review of the materials considered in preparing this document.

3. I previously submitted a declaration in this proceeding that I signed on December 6, 2023 (“Declaration”). I understand that the Declaration was marked as APPLE-1003. The Declaration contained my opinions and the bases for them. Since submitting the Declaration, I have considered the Declaration of Mr. Mark Alan Sturza (“Sturza Declaration”) (EX-2018), and U.S. Prov. Appl. No. 60/899,379 (“the ’379 Provisional”) (EX-2029), which is cited in the Sturza Declaration. My opinions from my previous Declaration have not changed.

II. BACKGROUND AND QUALIFICATIONS

4. My background and qualifications are set forth in the Declaration. I incorporate that section in this declaration (“Supplemental Declaration”) by reference.

III. INFORMATION CONSIDERED

5. In preparing this Supplemental Declaration, I have considered documentary materials listed below. In addition, my opinions are further based on my education, training, experience, and knowledge in the relevant fields.

- U.S. Patent No. 8,406,753 to Alles *et al.* (“the ’753 patent”) (APPLE-1001)
- Excerpts from the Prosecution History of the ’753 Patent (“the Prosecution History”) (APPLE-1002)
- U.S. Pat. App. Pub. No. 2006/0211376 (“Bhattacharya”) (APPLE-1004)
- U.S. Patent No. 7,783,299 to Robert J. Anderson *et al.* (“Anderson”) (APPLE-1006)
- Special Mobile Group (SMG) Technical Committee (TC), European Telecommunications Standards Institute, GSM Technical Specification - Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (GSM 04.08) (Dec. 1995) (APPLE-1007)
- U.S. Patent No. 6,560,442 to George Yost *et al.* (“Yost”) (APPLE-1008)

- Memorandum Opinion & Order, *Geoscope Technologies PTE. LTD. v Apple Inc.*, 1:22-cv-01373, (E.D. VA. Jul. 19, 2023) (APPLE-1020)
- Stipulation Regarding Agreed Upon Claim Constructions (Docket No. 70), *Geoscope Technologies PTE. LTD. v Apple Inc.*, 1:22-cv-01373, (E.D. Va. May 23, 2023) (APPLE-1025)
- Declaration of Mr. Mark Alan Sturza (EX2018)
- U.S. Prov. Appl. No. 60/899,379 (“’379 Provisional”) (EX2029)

IV. LEVEL OF ORDINARY SKILL IN THE ART

6. I set forth a definition of a person of ordinary skill in the art (“POSITA”) in the Declaration, and I incorporate that definition here by reference. I understand that Geoscope and Mr. Sturza disagree with the definition provided in the Declaration, and I address these points in Section VIII.A below.

V. RELEVANT LEGAL STANDARDS

7. I set forth the relevant legal standards in the Declaration, and I incorporate those legal standards here by reference.

VI. SUMMARY OF OPINIONS

8. I have been asked to consider whether the claims of the ’753 patent are anticipated or obvious over certain prior art references. As explained in the Declaration, and in further detail in this Supplemental Declaration, it is my opinion

that claims 1, 7, 9, 32, 38, and 40 of the '753 patent are obvious over Bhattacharya and Yost.

VII. OVERVIEW OF THE '753 PATENT

A. Priority Date

9. As explained in the Declaration, for purposes of my analysis, I apply 2/5/2007 ("Critical Date") as the earliest purported priority date of the '753 patent. All of the prior art relied on in the Declaration were published and/or filed before the Critical Date.

B. Specification

10. I summarized the '753 patent specification in the Declaration, and I incorporate that summary here by reference.

C. Claims

11. I summarized the '753 patent claims in the Declaration, and I incorporate that summary here by reference.

D. Prosecution History

12. I summarized the '753 patent claims in the Declaration, and I incorporate that summary here by reference.

VIII. PRIOR ART ANALYSIS

13. The Declaration analyzed how the combination of Bhattacharya and Yost render claims 1, 7, 9, 32, 38, and 40 of the '753 patent obvious. I incorporate

that analysis here by reference. In this Supplemental Declaration, I further address statements from Mr. Sturza relating to the prior art discussed in the Declaration.

A. Level of Ordinary Skill in the Art

14. As explained in the Declaration, a person of ordinary skill in the art (“POSITA”) would have “at least a Bachelor’s degree in electrical engineering, computer science, or a similar discipline, and at least two years of experience in the field working with navigation and/or geolocation systems.”

APPLE-1003, ¶8. I agreed with this POSITA definition when preparing the Declaration, and I continue to hold the opinion that the POSITA definition is both correct and appropriate based on the disclosures of the ’753 patent and the prior art analyzed in the Declaration.

15. My agreement to the POSITA definition in the Declaration is based on at least my knowledge and experience in the field of navigation and/or geolocation systems, and in the field of wireless technology. If I did not agree with the POSITA definition, then it would not have been included it in paragraph 8 of the Declaration. Based on my understanding of relevant legal principles, the POSITA definition therefore provides the appropriate perspective of a POSITA regarding the prior art analyses in the Declaration. *See* APPLE-1003, ¶¶9-18 (Legal Principles). As I discuss below, the POSITA definition is also consistent with my review of the ’753 patent and its file history. I also have a good

understanding of the capabilities of a POSITA because I have taught, mentored, advised, and collaborated closely with many such individuals over the course of my career. *Id.*, ¶8.

1. *The POSITA Definition Is Correct and Appropriate*

16. As explained below, the POSITA definition in the Declaration is correct and appropriate for various reasons. I also address statements from Mr. Sturza regarding the level of ordinary skill in the art for the '753 patent below.

17. Based on my knowledge and experience in the relevant field, a Bachelor's degree in electrical engineering, computer science, or a related field would provide foundational knowledge in signal processing, wireless communications, and potentially geo-location principles. This level of education implies a baseline understanding of signal behavior and basic calibration techniques. The specified two years of practical experience indicates that a POSITA would have hands-on familiarity with navigation and geo-location technologies. This experience would likely include understanding signal strength measurements, location determination methods, and basic calibration practices used in outdoor environments.

18. The field of navigation and/or geolocation systems would have encompassed knowledge of radio frequency and cellular technologies. Navigation and geolocation systems rely on understanding and utilizing signal propagation,

which is fundamental to both radio frequency (RF) and cellular technologies.

Accurate location determination involves analyzing signal strength, timing, and frequency characteristics, all of which are core aspects of RF and cellular engineering. As a result, professionals in navigation and geo-location systems would be expected to have knowledge and/or experience in these technologies to effectively develop and implement positioning solutions across diverse environments.

19. Based on my review of the '753 patent specification, knowledge of “radio frequency and cellular technologies” was within the skill level of the POSITA definition in the Declaration. The '753 patent specification confirms that these technologies were well-known. The '753 patent specification states that “[t]he use of wireless communication devices such as telephones, pagers, personal digital assistants, laptop computers, etc., hereinafter referred to collectively as ‘mobile appliances’ or ‘mobiles stations’ has become prevalent in today's society.” APPLE-1001, 1:24-28. The '753 patent specification also identifies examples of cellular standards, such as IDEN, GSM, UMTS. *See id.*, 10:9-22. Notably, the '753 patent does not delve into issues specific to cellular technologies, such as network infrastructure, cellular signal propagation, or cellular communication protocols. Instead, the '753 patent specification is generally focused on broader challenges associated with signal attenuation in indoor settings and its impact on

geo-location, without attributing these challenges to cellular technology-specific problems.

20. A professional working with geo-location systems around the Critical Date would have been familiar with cellular and wireless protocols because these technologies were important to the functionality of location-based services. By that time, cellular networks, such as GSM and UMTS, had been widely deployed, and protocols like GPS, Wi-Fi, and Bluetooth were commonly used in geo-location to determine or assist in finding a mobile station's position. Additionally, geo-location methods frequently relied on signal strength, timing, and other characteristics from cellular and wireless sources to improve accuracy, especially as location-based services expanded rapidly with mobile device adoption.

21. My review of Bhattacharya and Yost further confirms that knowledge of “radio frequency and cellular technologies” was also within the skill level of the POSITA definition in the Declaration. Bhattacharya describes that its “invention relates to **telecommunications in general**, and, more particularly, to a technique for estimating the location of a wireless terminal.” APPLE-1004, [0001] (emphasis added). Yost includes similar language in describing its disclosed invention. *See* APPLE-1008, 1:8-12. Bhattacharya also addresses a “wireless telecommunications system” that “provides wireless telecommunications service to

wireless terminals,” which was well-known as of its filing date. APPLE-1004, [0002]; *see also id.*, FIG. 1, [0002]-[0012].

22. Based on my review of Bhattacharya and Yost, the disclosures of these references help establish a level of ordinary skill relevant to understanding the ’753 Patent. As noted above, both references involve the use of wireless telecommunications systems to estimate the location of mobile or wireless terminals. Bhattacharya specifically addresses techniques for geo-locating wireless terminals within a telecommunications network, which involves knowledge of signal strength, propagation, and attenuation—core concepts relevant to, for example, modifying calibration data for indoor geo-location (as claimed in the ’753 patent). Yost also discusses the deployment of wireless telecommunications systems across geographic regions, which reflects familiarity with wireless infrastructure and the challenges of accurate location determination across different environments. *See* APPLE-1008, FIG. 2.

23. The declaration of Mr. Sturza (“Sturza Declaration”) also confirms that general knowledge of RF and cellular technologies within geo-location systems was within the level of ordinary skill associated with the POSITA definition. Specifically, the Sturza Declaration notes that “[a]t the time of the invention, geolocation using RF signals (e.g., **cellular data**, as opposed to, for example, GPS information) **was of interest in the field**.” EX-2018, ¶52 (emphasis

added). Around the Critical Date, RF-based geo-location, including cellular signal-based positioning, was recognized as a promising approach for indoor and urban environments where GPS signals were often unreliable due to signal obstruction. Based on my knowledge and experience in the field, professionals would have been familiar with RF and cellular technologies as tools for achieving more accurate location determination in challenging environments. Familiarity with RF and cellular concepts would thus be expected, as these technologies were important to advancements in geo-location systems, especially in providing alternative solutions to GPS limitations.

2. *Mr. Sturza's Alternative POSITA Definition*

24. The Sturza Declaration identified an alternative POSITA definition than the definition proposed in my original Declaration. This alternative POSITA definition is below:

A POSITA would have been (1) someone knowledgeable in wireless networks, cellular radio systems, mobile communication devices and radio navigation systems, (2) having at least a bachelor's degree in electrical engineering, with a background in radio frequency communications and/or navigation system technology as well as approximately two years of industry experience working on radio communication and/or navigation systems.

Ex-2018, ¶45.

25. As explained above, I agree with the POSITA definition in the Declaration. In my opinion, and based on my review of the documents analyzed in the Declaration, the original POSITA definition is a sufficient representation of the level of ordinary skill for an individual in order to perform the prior art analysis provided in the Declaration. In preparing this Supplemental Declaration, I have also considered the alternative POSITA definition proposed in the Sturza Declaration in relation to the prior art analysis provided in the Declaration.

26. Based on my review of the materials cited in the Declaration, the alternative POSITA definition proposed in the Sturza Declaration is also a sufficient representation of the level of ordinary skill for an individual in order to perform the prior art analysis provided in the Declaration. To be clear, I agree with the prior art analysis in the Declaration regardless of whether the original POSITA definition or the alternative POSITA definition are used to reflect the level of ordinary skill in the art. As I have explained above, geo-location systems were known around the Critical Date to use cellular and wireless protocols because these technologies were important to the functionality of location-based services. Based on this understanding, either POSITA definition would be relevant to the prior art analysis in the Declaration. I do not see any opinions provided by Mr. Sturza that are contingent on the differences between these definitions.

27. Specifically, the analysis of Bhattacharya and Yost in the Declaration is relevant to each of the fields of “wireless networks, cellular radio systems, mobile communication devices and radio navigation systems” that are referenced in the alternative POSITA definition. EX-2018, ¶45. Additionally, an individual having a Bachelor’s degree in electrical engineering” and a background in “radio frequency communications and/or navigation system technology as well as approximately two years of industry experience working on radio communication and/or navigation systems” would have similarly been capable of assessing the disclosures of Bhattacharya and Yost (alone or in combined) in relation to the claims of the ’753 patent.

28. As previously discussed, Bhattacharya and Yost each disclose that their respective inventions relate to “telecommunications in general.” APPLE-1004, [0001]; APPLE-1008, 1:8-12. The disclosures of Bhattacharya and Yost each also reference cellular protocols and geolocation systems. *See* APPLE-1005, [0052], [0056], [0095], [0129], [0130], [0138], [0164]; APPLE-1008, 1:15-32, 3:9-11, 4:1-10. Based on my review of Bhattacharya and Yost, the disclosures of each reference focuses on location estimation within a telecommunications infrastructure, which is encompassed by “wireless networks, cellular radio systems, mobile communication devices and radio navigation systems,” as referenced in the alternative POSITA definition. Bhattacharya and Yost address

these fields by integrating signal measurement, location databases, GPS assistance, and cellular radio components, which support mobile communications and navigation across wireless and cellular networks. The Bhattacharya and Yost systems also adapt signal-based location techniques traditionally used in one or more of these fields to improve accuracy and reliability in estimating device locations across diverse physical and radio environments.

B. “Grid Points”

29. As explained in the Declaration, certain terms recited in the claims of the ’753 patent were construed in a counterpart district court proceeding. APPLE-1003, ¶¶30-32. Based on my review of the ’753 patent specification, the file history, and the court’s claim construction order, I agree with the constructions issued by the court. I also stand by the analysis of “grid points” in the Declaration.

30. In this Supplemental Declaration, I address interpretation of “grid points” that was introduced in this proceeding after the Declaration. The Sturza Declaration asserts that a “grid point” is “a point associated with representative calibration data for an area whose boundaries are determined from evaluation of the calibration data.” EX-2019, ¶¶79-95.

31. Based on my knowledge and experience in the relevant fields, and my review of the ’753 patent specification and its file history (including the ’379 Provisional), I continue to believe that the district court’s interpretation of “grid

points” as “a point associated with representative calibration data for an area” is consistent with the claim language and intrinsic record.

32. As the primary support for its construction, Mr. Sturza argues that “the ’753 Patent explains that the boundaries of the area represented by a grid point—which define the shape of that area—are variable because they are based on evaluation of statistical similarities across the gathered calibration data.” EX2018, ¶83. Mr. Sturza further argues that the ’753 Patent requires that “[t]he ‘[s]tatistical similarity’ of the gathered calibration data [be] evaluated to generate a grid point, which includes defining the area it represents and associating it with calibration data that is representative of that area.” EX2018, ¶87. “Consequently, the ‘geometrical shape’ (i.e., boundaries) of the area represented by a particular grid point is ‘determined by the statistical similarity of the data’ allocated to a grid point, which is based on evaluation of the calibration data.” EX2018, ¶88.

33. However, the teachings of the ’753 Patent specification to which Mr. Sturza cites for these arguments exclusively relate to non-uniform grid points (“NUGs”). For example, Mr. Sturza’s block quotation from column 12 of the ’753 Patent clearly states that the “NUGs may fully cover the region R and each NUG may have statistically similar data accumulated into itself.” EX2018, ¶83 (citing APPLE-1001, 12:7-14). And the annotation of FIG. 6 of the related ’784 Patent is admitted by Mr. Sturza to show “a geographical region (R) having NUGs

represented by NUG1, NUG2, and NUG3.” EX2018, ¶¶84-85 (citing EX2017 [‘784 Patent], Fig. 6, 6:21-34). Further, the section of column 10 to which Mr. Sturza cites for the need to evaluate the calibration data for “statistical similarity” is in a paragraph describing the operation of “the NUG generator.” EX2018, ¶¶87-88 (citing APPLE-1001, 10:44-11:6) (emphasis added).

34. Thus, even if all of the unclaimed limitations on which Mr. Sturza focuses for its construction were properly attributable to a term (which they are not), that term would be “non-uniform grid point” or NUG. However, none of the Challenged Claims use the term “non-uniform grid point.” *See* APPLE-1001, 59:14-31 (claim 1), 59:45-46 (claim 7), 59:51-65 (claim 9), 63:49-67 (claim 32), 64:15-16 (claim 38), 64:21-35 (claim 40). Rather, the Challenged Claims more generally recite the term “grid point,” and the specification describes embodiments involving both uniform and non-uniform grid points. *See* APPLE-1001, 59:19-20.

35. The broader claim language here specifically distinguishes other patents that claim priority to the same provisional application as the ’753 Patent (*i.e.*, U.S. Provisional Application No. 60/899,379). *See* EX2018, ¶58 (illustrating “[t]he family relationship between” certain Geoscope patents being challenged in IPR). For example, dependent claim 2 of the ’104 Patent claims that “said database comprises previously-gathered calibration data for one or more **non-uniform grid points** within said region.” EX2016, 12:16-18. Similarly, dependent

claim 4 of the '784 Patent recites a method that “further compris[es] determining at said controller unit if said location data is statistically sufficient and if so entering said location data into a **non-uniform grid** generator.” EX2017, 9:51-54. Thus, where Geoscope wanted to focus exclusively on non-uniform grid points and the specifics of their generation, it did so with explicit claim language.

36. The '753 Patent could not be clearer that its process of location estimation is based on using either uniform grid points (UGs) or non-uniform grid points (NUGs). For example, the '753 Patent describes that, “[i]n a further aspect of embodiments of the present subject matter, an estimated location may be generated for a mobile device given a received NMR and a region ‘R’ over which a set ‘S’ of grid points (NUGs or UGs) have been established.” APPLE-1001, 25:31-34. Similarly, the '753 Patent describes that, “[i]n a further embodiment of the present subject matter, the individual pdf of each NC power level or other parameter in the NMR over the set of available grid points (NUGs or UGs) may be evaluated.” APPLE-1001, 26:32-35. In each of these cases, the '753 Patent explicitly teaches that its disclosed process of location estimation may be based on a set of “NUGs **or UGs**.” APPLE-1001, 25:31-34, 26:32-35. And the '753 Patent is also clear that a NUG is just one example of a “grid point.” See APPLE-1001, 13:11-12 (describing an example process for defining “a grid point, such as a NUG”).

37. With respect to a uniform grid point (UG), the '753 Patent describes that “a fixed uniform grid (‘UG’) [is] defined over the region R with the calibration point data being assigned to the **fixed grid points** by some rule (e.g., allocated by closest fixed grid point, a centroid of a set of fixed grid points, etc.).” APPLE-1001, 10:29-35. This is consistent with the description of the assignment of geographical coordinates to a grid point, in which “the calibration point may be located on a predetermined fixed uniform grid defined over the geographic region . . .” *See* APPLE-1001, 13:1-20. According to the '753 Patent, “one or more of the grid points may be randomly located within the geographic region, and one or more of the grid points may be located on a **predetermined fixed uniform grid** defined over the geographic region.” APPLE-1001, 35:41-45. In fact, dependent claims 4 and 35 recite that “one of said grid points is located on a predetermined fixed uniform grid defined over said geographic region,” confirming that the claimed “grid point” is broad enough to encompass a uniform grid point. *See* APPLE-1001, 59:38-40 (claim 4), 64:8-10 (claim 35).

38. The '753 Patent describes that these uniform grid points “may serve as the root of a first NUG.” APPLE-1001, 10:39-43. In other words, the generation of NUGs is an optional feature of the '753 Patent, and their generation may be based on using a UG as a root. *See id.* There is no requirement in the '753

Patent—and certainly not in the claim language itself—that the grid points upon which location estimation is based are NUGs.

39. These teachings contrast Mr. Sturza’s attempt to brush aside the ’753 Patent’s description of uniform grid points and their impact on the claim language. *See* EX2018, ¶¶64-67. For example, Mr. Sturza briefly acknowledges that “the ’753 Patent claims recite the generation of ‘grid points,’ not only ‘non-uniform grid points’ or ‘NUGs.’” EX2018, ¶64. Mr. Sturza is forced to make this admission because, as noted above, dependent claim 4 recites that “one of said grid points is located on a predetermined fixed uniform grid defined over said geographic region.” *See* EX2018, ¶65 (citing APPLE-1001, cl. 4). However, to minimize this inconvenient fact, Mr. Sturza misinterprets the ’753 Patent’s description that NUGs may be generated using a UG as a “root” to argue that “a single generated grid point may be anchored to a point on this uniform grid while the other generated grid points are not, and are nonuniformly distributed.” EX2018, ¶65.

40. However, the “one or more sets of grid points” recited in claims 1 and 32 are not so limited, particularly given that the above-noted teachings of the ’753 Patent explain that the set of grid points upon which location is estimated may be “NUGs or UGs,” and that “calibration point data” may be “assigned to ... **fixed grid points** by some rule.” APPLE-1001, 10:29-35, 25:31-34, 26:32-35. The ’753

Patent uses the disjunctive “or” to show that NUGs are just one option for the grid points, and it uses the plural when referring to uniform grid points to show that there may be multiple uniform grid points utilized in position estimation—not just the “single” anchor point Mr. Sturza postulates. Furthermore, the ’753 Patent teaches that, “[o]f course, one **or more of the grid points** may be . . . located on a predetermined fixed uniform grid defined over the geographic region.” APPLE-1001, 39:39-43.

41. These teachings of the ’753 Patent about the proper breadth of the term “grid point” stand to logical reasoning. If one claimed “grid point” can be a uniform grid point located on a “predetermined fixed uniform grid,” then without further limitation by the claims, “one or more sets” of such grid points must at least encompass a set of these uniform grid points. There is simply nothing in the claims or the specification to teach or even suggest to a POSITA that the claimed “one or more sets of grid points” must include only one uniform grid point or must include at least one non-uniform grid point. Certainly, the claimed “one or more sets of grid points” is broad enough to encompass one or more non-uniform grid points, but a POSITA would understand the inclusion of such non-uniform grid points as optional. *See* APPLE-1001, 25:31-34, 26:32-35.

42. For at least these reasons, Geoscope’s overly restrictive construction should be discarded. The district court’s construction is sufficient on its own and is consistent with the full and fair scope of the term “grid point.”

C. Application of The Bhattacharya-Yost Combination to Claims 1 and 32

43. I summarized the application of the Bhattacharya-Yost combination to features described in claims 1 and 32 of the ’753 patent in the Declaration, and I incorporate that analysis here by reference. *See, e.g.*, APPLE-1003, ¶¶76-80, 103.

44. The district court construed the term “grid point” to mean “a point associated with representative calibration data for an area.” APPLE-1025, 20. In other words a “grid point” is an association between two types of data: (1) a point or location, and (2) representative calibration data for an area. And the ’753 Patent describes the assignment of both “geographical coordinates” and “calibration data” to a grid point. *See, e.g.*, APPLE-1001, FIG. 3, 13:1-34. Thus, geographical coordinates alone are not a “grid point” as that term is used in the ’753 Patent or as properly construed by the district court. A “grid point” only exists when a location and calibration data are combined through association.

45. Bhattacharya describes the creation of a “grid point” consistent with the district court’s construction. As explained in the Declaration, Bhattacharya describes that “the Expected Signal-Strength Database is populated with the

expected signal strengths of three signals at each location in geographic region 200.” APPLE-1004, [0085]; *see* APPLE-1003, ¶¶72, 76-78. In other words, Bhattacharya describes the creation of an association that includes (1) a point or location and (2) representative calibration data for an area. *See* APPLE-1004, [0078], [0085]-[0086], [0105]-[0117]. Bhattacharya describes that “the expected signal strength at each location is generated by taking empirical measurements at various locations and by interpolating for the locations in between the sampled locations.” APPLE-1004, [0119]; APPLE-1003, ¶78. The generation of the “grid point” is only complete once the empirical measurements (*i.e.*, calibration data) have been provided and stored with the location. Accordingly, the “grid points” described by Bhattacharya are “for said calibration data,” as recited in [1b] and [32d], because each entry in Bhattacharya’s Expected Signal-Strength Database is only complete (and thus a “grid point”) once the expected signal strength data has been collected and interpolated. *See* APPLE-1004, [0119].

46. Furthermore, in the combination of Bhattacharya and Yost that I explained in the Declaration, the expected signal strength data is “representative” of an area, consistent with the district court’s construction. As explained in the Declaration, “at least one known method of generating expected signal strength for a geographic point would have been to collect multiple empirical measurements within the grid square surrounding the geographic point and average the multiple

empirical measurements.” APPLE-1003, ¶79 (citing APPLE-1008, 7:28-44). Mr. Struza has not presented any arguments against the obviousness or technical merits of this combination of Bhattacharya and Yost. As the Declaration concluded, “a POSITA would have understood or at least found it obvious that the expected signal strength functions $\{E(1,x,y,t), E(2,x,y,t), \text{ and } E(3,x,y,t)\}$ for a given grid point within the geographic region 200 may represent an average of calibration data from multiple locations within the grid square, and not simply represent the storage of the calibration data itself.” APPLE-1003, ¶80 (emphasis added). Accordingly, in the combination of Bhattacharya and Yost, the expected signal strength functions are “representative” of an area, consistent with the district court’s construction.