UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. AND
SAMSUNG ELECTRONICS AMERICA, INC.,

Petitioners,

v.

APEX BEAM TECHNOLOGIES LLC,

Patent Owner.

Patent No. 10,912,081
Filing Date: May 6, 2018
Issue Date: February 2, 2021

Inventor: Xiaobo Zhang
Title: METHOD AND DEVICE USED FOR WIRELESS COMMUNICATION IN UE AND BASE STATION

DECLARATION OF MIGUEL GOMEZ

Case No. IPR2023-00599

APPLE 1034

I, Miguel Gomez, declare as follows:

I. BACKGROUND AND QUALIFICATIONS

1. The details of my education, work experience, and research are summarized in my curriculum vitae ("CV") which is attached to this Report as **Exhibit A**. I have summarized some of the relevant information about my experience and qualifications below.

2. I received my Bachelor's degree in Electrical Engineering from Yale University in 1983.

3. I am a co-inventor on the following patents: U.S. Patent No. 7,814,204 "Method of and system for analyzing the content of resource requests", U.S. Patent No. 7,447,777 "Switching System", U.S. Patent No. 7,321,926 "Method and system for allocating resources to resource requests", U.S. Patent No. 8,412,838 "Method and system for analyzing the content of resource requests", and U.S. Patent No. 7,298,746 "Method and system for reassembling and parsing packets in a network environment."

4. In summary, I have more than 35 years of experience as an Electrical Engineer with a broad background in integrated circuit design, storage, power conversion, telephony and telecommunications.

5. I have prepared this Declaration as an expert witness retained by Apex Beam Technologies LLC. In this Declaration, I provide my opinions as to whether

the Challenged Claims of U.S. Patent No. 10,912,081 (the "'081 Patent") are valid. I provide technical bases for these opinions as appropriate.

6. This Declaration contains statements of my opinions formed to date and the bases and reasons for those opinions. I may offer additional opinions based on further review of the materials in this proceeding, including opinions and/or testimony of other expert witnesses.

II. MATERIALS CONSIDERED

7. The materials I considered include the '081 patent and the prosecution history for the '081 Patent. I also considered the materials that I refer to and that I cite in this declaration.

8. I also considered all papers and exhibits filed in IPR2023-00599 including the petition ("Pet.") and the declaration of Dr. Apostolos Kakaes.

9. I have also considered the Board's Decision on Institution (IPR2023-00599, Paper 9) ("Inst.") in this proceeding.

10. I have also considered any exhibits attached to the Patent Owner's Response in this proceeding, including the deposition transcript of Dr. Apostolos Kakaes.

11. In addition, I have drawn on my experience and knowledge, as discussed above and described more fully in my CV.

III. LEGAL PRINCIPLES

12. I understand that a patent claim is unpatentable as "obvious" if the subject matter of the claim as a whole would have been obvious to a person of ordinary skill in the art as of the time of the invention at issue.

13. I understand that the use of the "person of ordinary skill" rubric is to prevent one from improperly, in the present day, using hindsight to decide whether a claim is obvious.

14. I understand that the following factors must be evaluated to determine whether the claimed subject matter is obvious: (1) the scope and content of the prior art; (2) the difference or differences, if any, between the scope of the patent claim and the scope of the prior art; and (3) the level of ordinary skill in the art at the time of the invention.

15. I understand that, unlike anticipation, which allows consideration of only one item of prior art, obviousness may be shown by considering more than one item of prior art. I understand that, when considering a combination of prior art references as part of an obviousness analysis, it can be important to ascertain if the references are from the same field of endeavor and also to ascertain whether there is any reason that would have prompted a person of ordinary skill in the relevant art to combine the elements in the way the claim does. In other words, a claim generally cannot be rendered obvious by combining (i) art from across different fields,

including outside the field of the claimed invention, or (ii) art that itself teaches away from combination with other art that would otherwise provide its missing limitations, or (iii) art for which there is not at least an articulable, common sense reason to bridge the gap between its disclosure and the claim at issue.

16. Moreover, I understand that so-called "objective indicia of nonobviousness," also known as "secondary considerations," are also to be considered when assessing obviousness. I understand that this objective evidence includes at least: the commercial success of the invention; the long felt but unresolved need to develop the invention; any praise of the invention in the market; and copying by others. I also understand that evidence of objective indicia of non-obviousness must be commensurate in scope with the claimed subject matter; *i.e.*, that there must be a nexus or connection between the criteria and the claim itself.

17. I understand that the disclosure of an asserted prior art reference must provide an enabling disclosure of the desired subject matter and that mere naming or description of the subject matter is insufficient; to be enabling, I understand that it must be able to be produced without undue experimentation.

18. I understand that I must construe a claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and consistent with the prosecution history pertaining to the patent.

IV. LEVEL OF ORDINARY SKILL IN THE ART

19. I understand that I should perform my analysis from the viewpoint of a person of ordinary skill in the art. I understand that this hypothetical person of ordinary skill in the art is considered to have the normal skills of a person in a certain technical field. I understand that factors that may be considered in determining the level of ordinary skill in the art include: (1) the education level of the inventor; (2) the types of problems encountered in the art; (3) the prior art solutions to those problems; (4) rapidity with which innovations are made; (5) the sophistication of the technology; and (6) the education level of active workers in the field.

20. I understand that, in its Preliminary Response, Patent Owner utilized Petitioner's proposed level of skill in the art— a person of ordinary skill in the art ("POSITA") would have had "at least a master's degree in electrical engineering or a similar field and at least two years of experience working with multiple-input multiple-output (MIMO) technology in telecommunications systems" and that "[a]dditional relevant work experience can compensate for less education, and *vice versa*." Pet. at 13. I also understand that the Board noted that "Petitioner's last sentence regarding additional relevant work experience compensating for less education and *vice versa*, [] is vague." Inst. at 9-10. In view of the Board's guidance, my opinion is that a POSITA would have had either (i) at least a master's degree in electrical engineering or a similar field and at least two years of experience working

with telecommunications systems; or (ii) at least a bachelor's degree in electrical engineering or a similar field and at least five years of experience working with telecommunications systems.

21. My qualifications and experience exceed those of a person of ordinary skill in the art. Nonetheless, my analysis and opinions herein regarding the '081 patent are given from the perspective of a person of ordinary skill in the art.

V. CLAIM CONSTRUCTION

22. I have been informed by Counsel that, for purposes of my analysis in this *inter partes* review proceeding, claim terms should be given their ordinary and customary meaning within the context of the patent in which the terms are used, *i.e.*, the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention in light of what the patent teaches, unless it appears that the inventors were using them to mean something else. Additionally, the specification and prosecution history must be consulted to confirm whether the patentee has acted as his/her own lexicographer (*i.e.*, provided special meaning to any disputed terms), or intentionally disclaimed, disavowed, or surrendered any claim scope).

23. I have further been informed by Counsel that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears, but also in the context of the entire patent,

including the specification and the prosecution history. The prosecution file history provides evidence of how both the Patent Office and the inventors understood the terms of the patent, particularly in light of what was known in the prior art. Further, where the specification describes a claim term broadly, arguments and amendments made during prosecution may require a more narrow interpretation. For these reasons, the words of the claim must be interpreted in view of, and be consistent with, the entire specification. The specification is the primary basis for construing the claims and provides a safeguard such that correct constructions closely align with the specification. Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim as set forth in the patent itself.

24. I have further been informed by Counsel that, to determine how a person of ordinary skill would understand a claim term, one should look to those sources available that show what a person of skill in the art would have understood disputed claim language to mean. Such sources include the words of the claims themselves, the remainder of the patent's specification, the prosecution history of the patent (all considered "intrinsic" evidence), and "extrinsic" evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art. I understand that one looks primarily to the intrinsic patent evidence, but extrinsic evidence may also be useful in interpreting patent claims when the intrinsic evidence

itself is insufficient. Additionally, the context in which a term is used in the Asserted Claims can be highly instructive. Likewise, other claims of the patent in question, both asserted and not asserted, can inform the meaning of a claim term. For example, because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.

25. I have further been informed by Counsel that, while intrinsic evidence is of primary importance, extrinsic evidence, *e.g.*, all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises, can also be considered. For example, technical dictionaries may help one better understand the underlying technology and the way in which one of skill in the art might use the claim terms. Extrinsic evidence should not be considered, however, divorced from the context of the intrinsic evidence. Evidence beyond the patent specification, prosecution history, and other claims in the patent should not be relied upon unless the claim language is ambiguous in light of these intrinsic sources. Furthermore, while extrinsic evidence can shed useful light on the relevant art, it is less significant than the intrinsic record in determining the legally operative meaning of claim language.

26. I have been asked to provide my opinion on the terms "radio signal"

and "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols" in the context of the '081 Patent specification and claims.

A. "radio signal"

27. In my opinion, a person of ordinary skill in the art would understand that the claimed "radio signal" is a "signal that transmits particular radio information." I note that, despite the Parties not proposing any claim constructions during the Institution phase, Petitioner improperly construed both "the first radio signal" and "the second radio signal" to be capable of each comprising two separate radio signals with different content and transmitted at different times.

28. Based on the disclosure in the '081 Patent, a person of ordinary skill in the art would understand that the meaning of a signal is tied to the particular information transmitted. For example, Figure 5 of the '081 Patent discloses five ***different*** signals: second information (from UE to Base Station), first information (from Base Station to UE), third information (from Base Station to UE), second radio signal (from Base Station to UE), and first radio signal (from Base Station to UE):

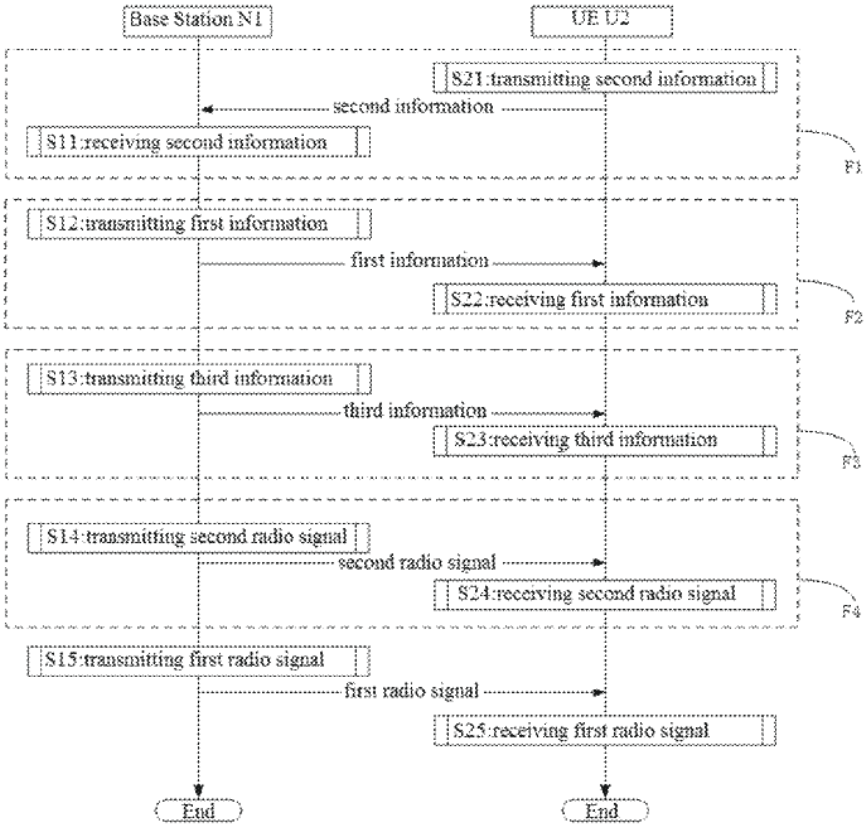
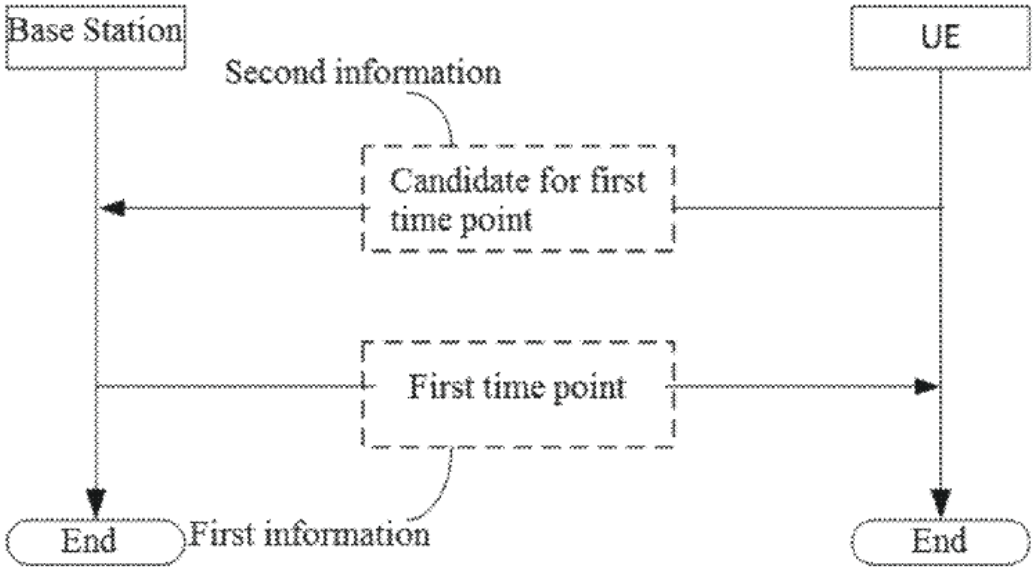


FIG. 5

’081 Patent, Fig. 5. In my opinion, a person of ordinary skill would understand that each of the five signals correspond to different pieces of particular information and that the ’081 Patent describes the information or content is particular to each signal. For example, the content for the first information signal is a “first time point,” the content for the second information is the “candidate [scheme] for the first time point,” and the content for the third information signal is “candidate scheme for the multi-antenna related receiving corresponding to the G multicarrier symbols [of the first radio signal]”:



’081 Patent, Fig. 8.

> The third information is used for determining a candidate scheme for the multi-antenna related receiving corresponding to the G multicarrier symbols.

’081 Patent, at 6:4-6. Because each of the content of the first, second, and third information signals is different, a person of ordinary skill in the art would not consider the first, second, and third information to be part or portions of the same signal.

29. Similarly, and for further example, the ’081 Patent is clear that each of the first and second radio signals correspond to particular content:

> In one subembodiment, the second radio signal is a DCI that is used for indicating downlink assignment, and the first radio signal is a PDSCH transmitted on the downlink resource indicated by the second radio signal.

’081 Patent, at 6:4-6. Because each of the content of the first and second signals is

different, a person of ordinary skill in the art would not consider the first and second radio signals to be part, or portions of, the same signal despite the fact that they may be transmitted back to back. In fact, I note that Petitioner's expert admits that, when signals are sent at different times (*e.g.*, each of the signals is sent on a physical downlink shared channel but five hours apart), a person of ordinary skill in the art would also understand that those are two separate signals with different information:

> Q. So using any of those signals that you just described, if two of those types of signals have different content, would a person of ordinary skill in the art consider the signals to be different signals?
> …
> A. If one of those signals is a physical downlink shared channel that takes place now and the other radio signal is a physical downlink shared channel that takes place five hours from now, the person would consider them to be different.

Ex. 2005, 22:11-17.

30. In my opinion, Wiley Electrical and Electronics Engineering Dictionary confirms that the content of a signal defines the signal. For example, a signal that transmits control information is a control signal:

> **control signal:**
>
> 2. In telecommunications, a signal that transmits control information.

Steven M. Kaplan, Wiley Electrical and Electronics Engineering Dictionary, p. 145

(2006)) (emphasis added).[1]

31. In my opinion, Petitioner understanding of what constitutes a single signal is at odds with the understanding that a person of ordinary skill in the art would have. Contrary to Petitioner's incorrect construction of "first radio signal" and "second radio signal," a person of ordinary skill in the art would construe "radio signal" to be a "signal that transmits particular radio information."

B. "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols"

32. I note that Petitioner's implied construction of Claim 1's limitation that "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols" is that the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols collectively. Sections VI.A.5 and VI.B.2. However, in my opinion, a person of ordinary skill in the art would understand, based on the claim limitations that follow, that "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols" should be construed as "the second radio signal is used for determining a time-domain resource occupied by ***each of*** the G multicarrier

[1] I note that this is particularly relevant, since, as I described in Section VI.A, both Petitioner and Patent Owner understand the claimed "second radio signal" of the '081 Patent to comprise control information. Yet, Petitioner argues that two different control signals somehow comprise one control signal (the claimed second radio signal), which is an understanding that a person of ordinary skill in the art would reject.

symbols."

33. In particular, I note the claim limitations that follow describe:

> ***as for any one given multicarrier symbol of the G multicarrier symbols***, the multi-antenna related receiving for the given multicarrier symbol is related to ***the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point*** in time domain;
>
> ***when the time-domain resource occupied by the given multicarrier symbol is behind the first time point***, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol; and
>
> ***when the time-domain resource occupied by the given multicarrier symbol is before the first time point***, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal; the first time point is one time point within the first time unit; and G is a positive integer.

'081 Patent, Claim 1. In my opinion, a person of ordinary skill in the art would readily understand that the time domain resource occupied by ***each one*** of the G multicarrier symbols must be determined by the second radio signal. Otherwise, a person of ordinary skill in the art would not have found it possible to determine, in the subsequent limitations, whether the time domain resource occupied by each one of the multicarrier symbols is before or behind the first time point.

34. Therefore, in my opinion, a person of ordinary skill in the art would understand that "the second radio signal is used for determining a time-domain

resource occupied by the G multicarrier symbols" should be construed as "the second radio signal is used for determining a time-domain resource occupied by ***each of*** the G multicarrier symbols" in order that the subsequent claim limitations logically follow.

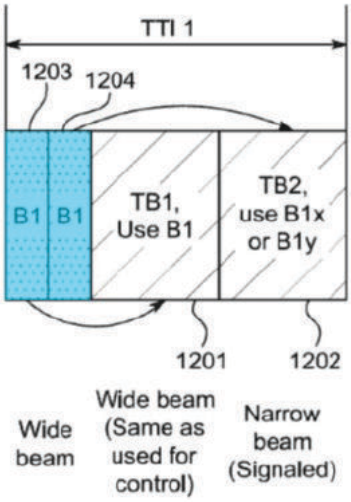
VI. PETITIONER FAILS TO SHOW ANTICIPATION OF THE CHALLENGED CLAIMS BY LEE OR RENDER THE CHALLENGED CLAIMS OBVIOUS OVER CHEN IN COMBINATION WITH LEE

A. Claims 1-12 Are Not Anticipated by Lee

1. Lee Does Not Disclose "*receiving a second radio signal*," as Required by Claim 1

35. As I note above, a person of ordinary skill in the art would have understood that a "radio signal" should be construed as a "signal that transmits particular radio information." Section V.A.

36. I note that the Petition fails to disclose this element because Petitioner does not identify a single radio signal with particular information as the one incoming "second radio signal." It is my understanding that Petitioner argues that two different control signals (B1 1203 and B1 1204) are collectively the claimed second radio signal:



Lee, FIG. 12 (annotated).

Pet. at 16.

37. I note that Petitioner's argument fails to disclose "receiving a second radio signal" because B1 1203 and B1 1204 are two separate control signals (i.e., each contain different particular information). It is my understanding that the part of the specification of Lee that discusses Fig. 12 confirms that B1 1203 and B1 1204 each contain different particular information because, referring to B1 1203 and B1 1204, Lee describes that:

> For example, ***transport block 1201 may be associated with control Tx beam 1203 and transport block 1202 may be associated with control Tx beam 1204.*** The first transport block may be mapped on to a first codeword provided in the control Tx beam 1203 and the second transport block may be mapped on to a second codeword provided in control Tx beam 1204. The codeword may be associated with: a specific beam or beam ID, a BRS, and/or a time/frequency location. As used herein, a codeword represents user data before it is formatted for transmission.

Ex. 1004, [0169]. A person of ordinary skill in the art would understand that each codeword in separate control Tx beams is separate particular information that each of two different transport blocks may be mapped on to. I note that Petitioner's expert confirms the understanding that each of Lee's B1 1203 and B1 1204 contains a different particular information, namely different code words that correspond to downlink control information for respective (i.e., separate) data:

> Q. So each of 1203 and 1204 contains a code word, correct?
> A. Provide a code word that could respond to the DCI that provides the downlink control information for the respective data.

Ex. 2005, 22:17-22.

> Q. So 1203 provides a first code word, right?
> A. Yes, it does.
>
> Q. And control transmission being 1204 provides a second code word, right?
> A. Yes, I think that's correct as well.

Ex. 2005, 23:16-22.

> Q. Would a person of ordinary skill in the art expect the code words associated with each of TB1 and TB2 to be different?
> A. One would expect them to be the same structure, but ***would provide different information…those specific values will be different in 1203 and 1204*** because TB1 and TB2 are located at ***different places on the time frequency resources and they're using different beams and that information would have -- would be conveyed in***

> ***1203 and in 1204*** for the respective portions of the signal representing the data in TB1 and TB2.

Ex. 2005, 25:2-25.

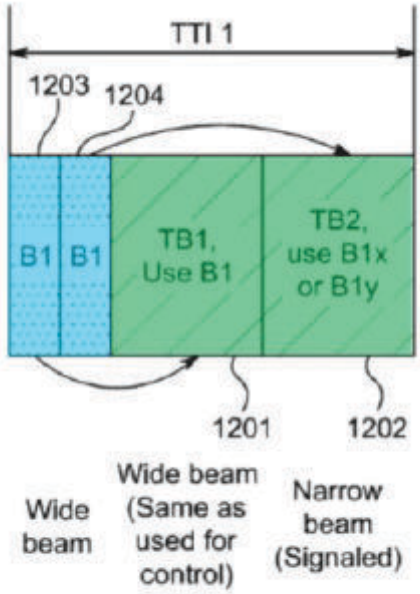
38. In my opinion, Petitioner's contention that that "[t]he '081 patent does not preclude the 'second radio signal' from having multiple portions" can be misleading. Pet. at 16 (citations omitted). As I note in Section V.A, having different particular information corresponds to different signals in the context of the '081 Patent, not portions of the same signal.

39. Therefore, in my opinion, Petitioner fails to show that Lee anticipates this claim limitation.

2. Lee Does Not Disclose "*receiving a first radio signal*," as Required by Claim 1

40. As I note above, a person of ordinary skill in the art would have understood that a "radio signal" should be construed as a "signal that transmits particular radio information." Section V.A.

41. I note that the Petition fails to disclose this element because Petitioner does not identify a single radio signal with particular information as the one incoming "first radio signal." It is my understanding that Petitioner argues that two different transport block signals (TB1 1201 and TB1 1202) are collectively the claimed first radio signal:



Lee, FIG. 12 (annotated).

Pet. at 17.

42. But, as with Petitioner's argument with respect to the "second radio signal," a person of ordinary skill in the art would understand that TB1 and TB2 are separate signals (i.e., each contain different particular information). With respect to Fig. 12 of Lee, which Petitioner relies upon (Pet. at 17), a person of ordinary skill in the art would have found that the disclosure of Lee is clear that TB1 and TB2 are "individual" signals in a "dual TB transmission" with different particular information carried, and different modulation and coding schemes:

> FIG. 12 shows a diagram for a ***dual TB transmission scheme***. ***Two or more transport blocks*** may be transmitted with a same beam as the control channel, or may be transmitted with different beams. For example, FIG. 12 illustrates two transport blocks 1201 and 1202 transmitted

> (multiplexed) in a TDM fashion within a single TTI (*e.g.*, TTI1). The transmission of the ***individual transport blocks*** may use the same beam as the control channel (*e.g.*, transport block 1201 which uses a wide beam), or may use a different beam (*e.g.*, transport block 1202 which uses a narrow beam).

Ex. 1004, [0167]. A person of ordinary skill in the art would have also found that each of Lee's transport blocks is also respectively associated with each of the different control Tx beams described in Section VI.A.1:

> For example, ***transport block 1201 may be associated with control Tx beam 1203 and transport block 1202 may be associated with control Tx beam 1204.*** The first transport block may be mapped on to a first codeword provided in the control Tx beam 1203 and the second transport block may be mapped on to a second codeword provided in control Tx beam 1204. The codeword may be associated with: a specific beam or beam ID, a BRS, and/or a time/frequency location. As used herein, a codeword represents user data before it is formatted for transmission.

Ex. 1004, [0169]. A person of ordinary skill in the art would understand that each transport block in a dual TB transmission scheme is associated with separate codewords in separate control Tx beams and therefore, each transport block comprises separate particular information. I note that Petitioner's expert confirms the understanding that each of Lee's TB 1201 and TB 1202 contains different particular information, for example, "different places on the time frequency resources" and "using different beams":

> Q. Would a person of ordinary skill in the art expect the code words associated with each of TB1 and TB2 to be different?
>
> A. … TB1 is being transmitted using a wide beam, as he explains in the figure 12, and TB2 is transmitted using a narrow beam and the specific aspects needed to receive those respective portions of the data block, for example, beam IDs time and frequency resource locations used for each of them, those specific values will be different in 1203 and 1204 because ***TB1 and TB2 are located at different places on the time frequency resources and they're using different beams*** and that information would have -- would be conveyed in 1203 and in 1204 for the respective portions of the signal representing the data in TB1 and TB2.

Ex. 2005, 25:2-24.

43. I note that, for the claimed "second radio signal," Petitioner contends that "[t]he '081 patent does not preclude the 'first radio signal' from having multiple portions." Pet. at 18. As I note in Section V.A, having different particular information corresponds to different signals in the context of the '081 Patent, not portions of the same signal.

44. Therefore, in my opinion, Petitioner fails to show that Lee anticipates this claim limitation.

3. Lee Does Not Disclose "*wherein the first radio signal is transmitted within a first time unit" or "the second radio signal is transmitted within the first time unit*," as Required by Claim 1

45. In my opinion, since Petitioner fails to show how Lee discloses "the first radio signal" or "the second radio signal," it cannot now disclose "wherein the

first radio signal is transmitted within a first time unit" or "the second radio signal is transmitted within the first time unit," as required by this claim limitation. Sections VI.A.1 and VI.A.2.

46. Therefore, in my opinion, Lee does not anticipate these claim limitations.

4. Lee Does Not Disclose "*first bit block is used for generating the first radio signal*," as Required by Claim 1

47. In my opinion, since Petitioner fails to show how Lee discloses, teaches, or suggests "the first radio signal," it cannot now disclose, teach, or suggest "first bit block is used for generating the first radio signal," as required by this claim limitation. Section VI.A.1.

48. Specifically, a person of ordinary skill in the art would understand that Lee's MAC PDU (which Petitioner alleges corresponds to the first bit block) does not generate a first radio signal. As I note in Section VI.A.2, Lee describes that two different signals are generated (*i.e.*, TB1 and TB2) from two different code words (CW) (i.e., different particular information) instead of one radio signal.

49. Therefore, in my opinion, Lee does not anticipate this claim limitation.

5. Lee Does Not Disclose "*the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols*," as Required by Claim 1

50. In my opinion, since Petitioner fails to show how Lee discloses, teaches, or suggests "a second radio signal," it cannot now disclose, teach, or suggest

"the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols." Section VI.A.1.

51. Moreover, as noted above, a person of ordinary skill in the art would have understood that "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols" should be construed as "the second radio signal is used for determining a time-domain resource occupied by ***each of*** the G multicarrier symbols." Section V.B.

52. However, I note that Petitioner, and Lee, are silent regarding the determination of occupied time domain resources for each of the G multicarrier symbols in the first radio signal. Instead, I note that Petitioner only describes that "*Lee* discloses that the control channel may carry scheduling information for the data channel." Pet. at 25 (citing Ex. 1004, [0110]). But a person of ordinary skill in the art would understand that Lee is limited to disclosing a codeword that "may be associated with: …a time/frequency location" of the respective entire transport block mapped to that codeword. Ex. 1004, [0169]. Therefore, a person of ordinary skill in the art would understand that nowhere does Lee (or Petitioner) describe how a determination of occupied time domain resources is made for each of G multicarrier symbols, but only on a transport block basis.

53. Therefore, in my opinion, Lee does not anticipate this claim limitation.

6. Lee Does Not Disclose "*as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain*," "*when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol*," and "*when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal*," as Required by Claim 1

54. In my opinion, since Petitioner fails to show how Lee discloses, teaches, or suggests "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols," it cannot now disclose, teach, or suggest "when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol," and "when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal." Section VI.A.1.

55. Moreover, in my opinion, since Petitioner fails to show how Lee discloses, teaches, or suggests "a second radio signal," it cannot now disclose, teach, or suggest "as for any one given multicarrier symbol of the G multicarrier symbols,

the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain," "when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol," and "when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal." Section VI.A.5.

56. Specifically, I note that Lee does not describe a determination, on a multicarrier symbol basis, as these claim limitations contemplate, and as a person of ordinary skill in the art would understand them. Merely disclosing that "Lee's transport blocks TB1 and TB2 include a positive number G multicarrier symbols" and that "*Lee* discloses switching from a wide beam to a narrow beam at the first time point," would not enable a person of ordinary skill in the art to ascertain whether each multicarrier symbol occupies a time domain resource before or after the first time point. Pet. at 28-29. Similarly, I note that Petitioner mentions that "*Lee* discloses that "the narrow beam ID may need to be signaled in the control region of the TTI" (citing *Lee*, [0167]; *see also* [0006]-[0008], [0150], [0156], [0168], [0172], [0258], FIGS. 10, 19) and that "*Lee* discloses that 'a first TB (TB1) may use the

same wide beam or the same beam ID as the control channel'" (citing *Lee*, [0168]; *see also* [0156], [0258], FIGS. 10, 19.). Pet. at 30-31. In my opinion, a person of ordinary skill in the art would find such a disclosure insufficient to show the claimed limitations because the mere facts of a wide beam and narrow beam and associated IDs is inapposite to determining an occupied time domain resource for a specific multicarrier symbol and its relation to a first time point. To the extent the control signals of Lee disclose time domain resources and relation to a first time point, a person of ordinary skill in the art would understand the disclosure to be pertaining to the occupied time domain resource of each transport block as a whole, not on a multi-carrier symbol basis, as required by these claim limitations.

57. Therefore, in my opinion, Lee does not anticipate these claim limitations.

7. Independent Claims 5, 9, and 11 are Not Anticipated by Lee

58. I note that Claim 5 recites "[a] method in a base station device for wireless communication" that mirrors the claim limitations of Claim 1, which recites "[a] method in a User Equipment (UE) for wireless communication." In other words, a person of ordinary skill in the art would have understood that Claim 5 discloses a method from the perspective of the base station that is in communication with the UE in Claim 1. In my opinion, for at least the same reasons as Claim 1, Lee fails to anticipate Claim 5.

59. I note that Claim 9 recites "[a] UE for wireless communication," which is the apparatus claim of Claim 1. In my opinion, for at least the same reasons as Claim 1, Lee fails to anticipate Claim 1.

60. I note that Independent Claim 11 recites "[a] base station device for wireless communication" that mirrors the claim limitations of Claim 9, which recites "[a] UE for wireless communication." In other words, a person of ordinary skill in the art would have understood that Claim 11 discloses the base station device that is in communication with the UE in Claim 9. In my opinion, for at least the same reasons as Claim 9, Lee fails to anticipate Claim 11.

8. Dependent Claims 2-4, 6-8, 10, and 12 are Not Anticipated by Lee

61. I note that Claims 2-4 are dependent on Claim 1, Claims 6-8 are dependent on Claim 5, Claim 10 is dependent on Claim 9, and Claim 12 is dependent on Claim 11. Therefore, in my opinion, Claims 2-4, 6-8, 10, and 12 are not anticipated by Lee for at least the same reasons as Claims 1, 5, 9, and 11, respectively.

B. Claims 1-12 Are Not Obvious Over the Combination of Chen and Lee

1. Any Combination of Chen and Lee Does Not Disclose "*first bit block is used for generating the first radio signal*," as Required by Claim 1

62. I note that Petitioner does not rely on Chen to disclose "a first bit block

[] used for generating the first radio signal" and, instead, only relies on "*Lee*'s teachings of a data message generated by a bit block (*e.g.*, MAC PDU)" that Petitioner alleges could be implemented into Chen's method. Pet. at 55-58.

63. However, a person of ordinary skill in the art would have understood that Lee's MAC PDU does not generate a first radio signal. As I describe in Section VI.A.4, Lee's alleged first bit block (MAC PDU) generates two different signals (*i.e.*, TB1 and TB2) associated with two different code words (CW), instead of generating one radio signal.

64. Therefore, in my opinion, Chen in combination with Lee does not render obvious this claim limitation.

2. The Combination of Chen and Lee Does Not Disclose "*the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols*," as Required by Claim 2

65. As I note above, a person of ordinary skill in the art would have understood that "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols" should be construed as "the second radio signal is used for determining a time-domain resource occupied by ***each of*** the G multicarrier symbols." Section V.B.

66. As a preliminary matter, the specification of Chen does not even mention multicarrier symbols. Ex. 1012. Additionally, I note that, similar to Lee (Section VI.A.5), and as Petitioner admits, Chen only discusses indicating time-

domain resource occupation for the full data message, not on an individual multicarrier symbol basis, as the claim requires. Pet. at 60 ("[A] POSITA would have understood that *Chen*'s control message and/or scheduling message includes information indicating a time-domain resource occupied by *Chen*'s data message ("first message")."

67. Therefore, in my opinion, Chen in combination with Lee does not render obvious this claim limitation.

3. Any Combination of Chen and Lee Does Not Disclose "*as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain*," "*when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol*," and "*when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal*," as Required by Claim 1

68. As I note above in Section VI.B.2, Chen does not mention multicarrier symbols at all in its specification, and therefore cannot disclose, teach, or suggest any of these claim limitations. Ex. 1012. At least for this reason, a person of ordinary skill in the art would have understood that Chen cannot disclose the relational nature of receiving ***any given multicarrier symbol*** to the relative position of the time-domain resource occupied by that multicarrier symbol with respect to Petitioner's

alleged first time point.

69. Relatedly, in my opinion, since Petitioner fails to show how Chen in combination with Lee discloses, teaches, or suggests "the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols," it cannot now disclose, teach, or suggest "as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain," "when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol," and "when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal." Section VI.B.2.

70. Moreover, in my opinion, a person of ordinary skill in the art would understand Petitioner's citations to Chen to be inapposite because, while they describe switching beams based on parameters at a given point in time (i.e., what Petitioner alleges is the claimed first time point), Chen does not describe any determination of the time domain resource occupied by each multicarrier symbol in

order to further determine whether each time domain resource is before or behind a first time point. Pet. at 63 *(Chen* further discloses that "a reception beam indicated by the parameter indication information may be a receiver parameter different from the receiver parameter currently used by the receiving end device; at this time, the receiving end device needs to switch the receiver parameter."); Pet. at 65 *("Chen* discloses that "the default receiver parameter may be the receiver parameter currently used by the receiving end device for rapid decoding of the message transmitted by the transmitting end device.").

71. Therefore, in my opinion, Chen in combination with Lee does not render obvious this claim limitation.

4. Any Combination of Chen and Lee Does Not Render Obvious Claims 5, 9, and 11

72. I note that Claim 5 recites "[a] method in a base station device for wireless communication" that mirrors the claim limitations of Claim 1, which recites "[a] method in a User Equipment (UE) for wireless communication." In other words, a person of ordinary skill in the art would have understood that Claim 5 discloses a method from the perspective of the base station that is in communication with the UE in Claim 1. In my opinion, for at least the same reasons as Claim 1, Chen in combination with Lee does not render obvious Claim 5.

73. I note that Claim 9 recites "[a] UE for wireless communication," which is the apparatus claim of Claim 1. In my opinion, for at least the same reasons as

Claim 1, Chen in combination with Lee does not render obvious Claim 9.

74. I note that Independent Claim 11 recites "[a] base station device for wireless communication" that mirrors the claim limitations of Claim 9, which recites "[a] UE for wireless communication." In other words, a person of ordinary skill in the art would have understood that Claim 11 discloses the base station device that is in communication with the UE in Claim 9. In my opinion, for at least the same reasons as Claim 9, Chen in combination with Lee does not render obvious Claim 11.

5. Any Combination of Chen and Lee Does Not Render Obvious Claims 2-4, 6-8, 10, and 12

75. I note that Claims 2-4 are dependent on Claim 1, Claims 6-8 are dependent on Claim 5, Claim 10 is dependent on Claim 9, and Claim 12 is dependent on Claim 11. Therefore, in my opinion, Claims 2-4, 6-8, 10, and 12 are not rendered obvious by the combination of Chen and Lee for at least the same reasons as Claims 1, 5, 9, and 11, respectively.

VII. SUMMARY OF OPINIONS

76. It is my opinion that the Board should confirm the validity of the challenged claims. I reserve the right to supplement my opinions in response to any additional contentions by Petitioner or opinions by Dr. Apostolos Kakaes, and as the Board permits.

77. I declare that all statements made herein of my own knowledge are true

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

Executed on January 12th, 2024 in Livermore, CA.

Miguel Gomez

EXHIBIT A

Curriculum Vitae of Miguel Gomez

2178 Sirah Ct., Livermore CA 94550
miguel@rockslideanalytics.com
ph. 415.793.4103

Mr. Gomez has thirty five years of experience in the design and development of hardware and software technology used in telecommunications, data communications, networking and storage infrastructure. He also is highly skilled in the use of microelectronics simulation software, ASIC & FPGA coding and Verilog. Mr. Gomez has designed and coded digital switching, optical encoders, and semiconductor memory hardware and software.

Expertise

- ASIC & FPGA Design
- Computer Architecture
- Computer Buses, Cache, and I/O
- Hardware Emulators
- Hardware Programming Languages
- Hardware Verification & Test
- Software Programming Languages
- Network Protocols
- Telecom Protocols
- Storage, Raid Controllers
- Digital Switching Technology
- Modems
- Security in place, security in motion
- Compression Algorithms,
- Optical Encoders
- Video Capture and Display Systems
- Semiconductor Memories
- Power supply design
- Power Inverter design.
- Computer Vision

Consulting Areas

Computer Architectures
- Data General
- IBM PC
- MIP 3000, 4000
- Intel 8051, x86, Pentium II
- Motorola 68000
- TI TMS320Cxx (DSP)
- PowerPC

Computer Buses:
- USB
- I2C
- PCI
- ISA
- EISA
- PCMCIA
- SBUS
- VME
- S100

Hardware Programming Languages:
- PALASM
- ABEL
- AHDL
- VHDL
- Verilog

Hardware Simulation and Compilation
- Synopsys VCD
- Synplicity
- ModelSim
- VerilogNC
- Spice, Hspice

ASIC and FPGA Design:
- Actel
- Altera
- Xilinx

Networking Protocols:
- ATM
- TCP/IP
- Ethernet
- VOIP
- HTTP/HTML
- SIP/SDP

Software Programming Languages:
- C,C++
- BASIC, VISUAL BASIC
- Assembly and Machine Languages
- FORTRAN
- Java
- Pascal
- Python/Django/bootstrap

Operating Systems:
- MSDOS
- Windows 3.1/NT/9x/2000/XP/CE
- UNIX

Communications
- Spread Spectrum (802.11a,b,g,n)
- LTE
- ODFM
- RF Transmission and reception
- CDMA/GSM

Power Electronics
- Solar Inverters
- 3-phase motors

CAD Tools
- Max+Plus II, Quartus (Altera)
- XACT, ISE (Xilinx)
- Mentor
- Orcad
- Allegro
- Viewlogic

- Schema
- P-Cad

Hardware Emulators
- Quickturn
- Ikos
- Zycad

Computer Memories
- SDRAM
- Rambus
- DDR I,II
- SDR

Compression:
- ADPCM

- H.264

Education

Year	College or University	Degree
1983	Yale University	BSEE

Engineering Experience

From: April 2013
To: Present
Organization: Rockslide Analytics, LLC.
Title: CEO
Summary: Mr. Gomez founded Rockslide Analytics in order to develop and eventually sell a depth sensing camera. A depth sensing camera can image a scene in three dimensions. Currently Rockslide Analytics is also used to promote Mr. Gomez's consulting and expert work.

From: August 2006
To: March 30, 2009
Organization: ActSolar Inc.
Title: VP Engineering and System Architect
Summary: Mr. Gomez has designed and built a 400 watt power inverter which takes an input voltage of 30 volts DC and converts it to 240 VAC. Included in the design is an energy compensation circuit that recovers up to 40% of power normally lost due to power factor correction issues. Included as part of the inverter system was rooftop data collection for power and temperature with wireless connections to cloud management services.

ActSolar was sold to National Semiconductor Corp. on March 19, 2009.

From: September 2004
To: August 2005
Organization: BridgeWave Inc.
Title: Consultant
Summary: Mr. Gomez built a 10 gig Ethernet test platform to facilitate manufacturing tests of Bridgewave's high speed wireless network system. This system replaced the Smart Bits Ethernet test analyzer in the manufacturing test environment.

- Built test generator: Ethernet packet generator which generated packets of various sizes, address spaces, payload and checksums.
- Built test receiver and analyzer which detected various failure mechanisms, maintained statistics and reported them to a user interface written in Lab View.
- Used the Xilinx Vertex II in the 2003 version. Used Xilinx Spartan 3e in 2004 version.

From: September 2004
To: September 2004
Organization: PA Consulting Group
Title: Consultant

Summary: Miguel Gomez has provided hardware evaluation services for corporate mergers and acquisitions. These services include systems and hardware reviews in the following areas:

- Analysis of system performance to cost of the hardware implementation. Costs include development time, flexibility of the system for future growth and final product costs.
- Review of the VHDL and Verilog code implementations, documentation and development strategies.
- VHDL and Verilog code management including compilation processes, simulation, test coverage, bug tracking and source code control.
- FPGA and ASIC tool chain management.
- Circuit board design and layout for production environments
- Circuit board certification testing for FCC, UL, and Environmental tests
- Review of production line management including assembly and test processes.

From: Jan 2003
To: May 2003
Organization: Santel Networks
Title: Consultant
Summary: Mr. Gomez Developed an optical duo-binary (ODB) encoder. At 10.7 Giga bits per second (GBps) ODB reduces the spectral spread to ½ of the ordinary NRZ format. This format allows high spectral efficiency over long distances by reducing nonlinear penalties due to narrower channel spacing and allows a higher bit rate or increases transmission distances. The project was implemented in a Xilinx FPGA running at 667 Mbs with a 10.7 GHz Mux/Demux feeding 16 LVDS streams to the FPGA. The ODB behavior was simulated in a C-coded simulation. The circuit board's highest clock speed was 10.7 Gigahertz and was modeled in HSPICE. Board level simulation was performed using NCVerilog. Several Patents were applied for and the board was shown at the Optical Fiber Communication Conference & Exposition in March of 2003.

From: March 2001
To: December 2002
Organization: Extreme Networks, Inc.
Title: Director of Hardware, Content Networking Division
Summary: Mr. Gomez managed a team of Hardware and Software engineers, which developed and maintained a Layer 5 Content Addressable Switch. The switch is capable of L2, L3, L4 switching as well as L5 switching which uses HTTP headers to make routing decisions. All routing decisions were made in real time (1 GBPs) by hardware in FPGAs while a Power PC provided a user interface, configuration management and housekeeping diagnostics. Communications between the hardware elements and the PowerPC CPU was via a PCI bus.

From: January 2000
To: March 2001
Organization: Webstacks, Inc. (Now Extreme Networks, Inc.)

Title: Director of Hardware
Summary: Extreme Networks and several venture founding partners commissioned Webstacks to build a Content Addressable Switch. As the number four employee Mr. Gomez was hired to be the system architect and to in-turn to hire the hardware team which would implement it. He hired 13 ASIC, FPGA and software engineers into his department and managed them for the duration of the project. Time to development was one year and at that time functionality was proven to Extreme, which then bought Webstacks for $68MM cash and stock.

From: February 1997
To: December 1999
Organization: Philips Semiconductor
Title: Consultant
Summary:

- Developed the certification environment which was used by Philips Semiconductor and Microsoft to verify operation of Philips' Poseidon handheld chipset running Windows CE. This included board development, FPGA coding and simulation as well as porting Windows CE.
- Supported development of Philip's version of the Mips 4000 along with several of the peripheral devices that made up the system on a chip and the bus interconnect.
- Miguel Gomez also developed the ASIC logic and board level hardware for a 56Kbs software modem while at Philips.

From: September 1994
To: January 1997
Organization: Minden Group, Inc.
Title: President & Founder
Summary: After founding The Minden Group, Miguel Gomez developed several types of memory adapters used to adapt various sizes and types of memory sticks into Personal Computers. These were sold through retail stores throughout the nation. Over 250,000 memory adapters were sold at stores such as Fry's, CompUSA, Computer City and Future Shop. Miguel Gomez also designed a video conferencing system including a low cost video capture board and modified drivers. This system was also sold through the retail channels.
After developing these products he organized and managed a small team of 10 to 15 product managers and sales personal. Manufacturing was done in Taiwan with final assembly and distribution in the United States.

From: April 1989
To: August 1994
Organization: Spectrum Analysis, Inc.
Title: Founder & President
Summary: Consulting services company which Mr. Gomez founded specializing in computing, telephony and data systems. The company was a full service design firm capable of electrical circuit design with emphasis on ASIC, FPGA and ASIC emulation as well as complex PCB level designs. Responsibilities as founder were to identify specific business opportunities as well as to manage and implement portions of the technical projects.

From: August 1987
To: March 1989
Organization: Quickturn Systems, Inc.
Title: Applications Manager
Summary: Quickturn developed an ASIC emulator using Xilinx FPGAs. Mr. Gomez was hired as Quickturn's first applications engineer, and was initially responsible for developing the training and demonstration systems for Quickturn's initial customers. Later as the company matured, he managed the customer support team. Since this ASIC emulator worked at a fraction of clock speed, he developed a methodology of slowing board designs to 100s of KHz while maintaining clock and memory (DRAM) integrity.

From: July 1987
To: September 1988
Organization: Telestream Corporation
Title: Applications Engineer
Summary: Applications engineer responsible for demonstration system development, training and sales support of the Telestream programmable voice and data management system.

From: March 1985
To: April 1987
Organization: Stratacom, Inc.
Title: Design Engineer
Summary: Responsible for development and maintenance of an Adaptive Differential Pulse Code Modulation (ADPCM) voice compression board. This system allowed twice as many calls to be placed on Tl transmission lines. Also developed Stratacom’s digital data over T1 lines which was used in Stratacom's network management system, a precursor to frame-relay.

From: June 1983
To: March 1985
Organization: ROLM Corporation
Title: Design Engineer
Summary: Responsible for the development of a multiplex/demultiplex hardware board used in the ROLM BUS 295 telephone switch. A novel elastic buffer was used to automatically determine the length of an inter-cabinet data bus, whose length varied based on the customer's requirements. This eliminated the need for manufacturing technicians to manually adjust clock skew.

Litigation Support Experience

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Fabricant LLP
Case Names:	Rampart v. NXP Semiconductors 6:21-CV-01294-ADA Supported Rampart
Services Provided:	Investigated DDR SDRAM memory systems
Dates	December 2022 - September 2023

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Winston Strawn LLP
Case Names:	Flypsi Inc. v. Google LLC 6:22-cv-00031 Supported Flypsi
Services Provided:	Investigated Voice over IP software code.
Dates	February 2023 - Present

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Sheridan Ross LLC
Case Names:	K.Mizra v. Cisco Systems 6:20-cv-01031 Supported K.Mizra
Services Provided:	Investigated infringement related to contagion detection, isolation and repair.
Dates	February 2023 - Present

Expert Engagement:

Type of Matter:	Patent Infringement Case

Law Firm:	Procopio, Cory, Hargreaves & Savitch LLP
Case Names:	RICMIC LLC v. Teldata Enterprise Networks 3:21-cv-1334-CAB-MDD Supported Teldata
Services Provided:	Wrote invalidity report to a health care and safety alerting system patent. Investigated prior art source code.
Dates	June 2022 - May 2023

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Hoge Fenton LLP
Case Names:	Michael Joseph Costabile v. Ustopit, LLC 7:21-cv-00155-BO Supported Michael Constablile
Services Provided:	Investigated infringement of timing systems in sports events. Wrote claim construction report and defended opinions at deposition.
Dates	August 2022 - March 2023

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Fabricant LLP
Case Names:	RFCyber v. Apple Inc. IPR2022-00412, IPR2022-00413 Supported RFCyber
Services Provided:	Wrote and defended a response to invalidity contentions concerning security used in financial transactions.
Dates	November 2022 - February 2023

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Fabricant LLP
Case Names:	Rampart Asset Management v. NXP, Renesas, Texas Instruments, Huawei and Silicon Motion. 6:20-cv-01031 Supported Rampart Asset Management

Services Provided:	Investigated infringement related to PCIe equalization circuits.
Dates	January 2022 - February 2022

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Fish and Richards
Case Names:	Ikorongo v. Bumble Trading LLC 6:20-cv-00256 Supported Bumble Trading LLC
Services Provided:	Investigated infringement related to collecting geographic location data from cell phones.
Dates	October 2021 - November 2021

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Folio Law PLLC
Case Names:	K.Mizra v. Cisco Systems 6:20-cv-01031 Supported K.Mizra
Services Provided:	Investigated infringement related to contagion detection, isolation and repair.
Dates	June 2021 - October 2021

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Mintz
Case Names:	Philips v. MediaTek, RealTek 337-TA-1222 Supported Philips
Services Provided:	Investigated infringement related to securing digital video.
Dates	January 2021 - July 2021

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Russ August & Kabat
Case Names: EcoFactor v. Google, ecobee, Alarm, Vivent
337-TA-1185

Supported EcoFactor

Services Provided: Investigated infringement related to smart thermostat devices.

Dates February 2020 - September 2020

Expert Engagement:
Type of Matter: Patent Infringement Case
Law Firm: Russ August & Kabat
Case Names: Pavo Technologies v. Kingston
8:14-cv-1352-JLS

Supported Pavo

Services Provided: Investigated infringement related to USB Flash Drives. I provided a written opinion, defended my opinions in a deposition and testified at trial.

Dates February 2019 - February 2020

Expert Engagement:
Type of Matter: Patent Infringement Case
Law Firm: Orrick
Case Names: Infinity Computer Products Inc. v. Toshiba America Business Solutions'
2:12-cv-06796-NIQA

Supported Konica Minolta Business Solutions (Defendant).

Services Provided: Investigated infringement related to fax/business copy solutions

Dates April 2019 - June 2019

Expert Engagement:
Type of Matter: Contracts Dispute
Law Firm: HorizonIP
Case Names: Smith v. ORBCOMM

Supported ORBCOMM

Services Provided: Investigated geolocation services for asset tracking.

Dates March 2019 - July 2019

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Russ August & Kabat
Case Names:	SPEX Technologies v. Kingston Supported SPEX
Services Provided:	Investigated infringement related to secure disk drives. I provided a written opinion, defended my opinions in three depositions and testified at trial.
Dates	January 2017 - July 2020

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Orrick, Herrington & Sutcliffe
Case Names:	Synopsys v. Mentor Graphics Inv. Supported Synopsys
Services Provided:	Analyzed FPGA based hardware emulators relative to patent infringement allegations. Provided written statements.
Dates	December 2014 – September 2017

Expert Engagement:

Type of Matter:	Inter Partes Review
Law Firm:	Schmeiser, Olsen & Watts
Case Names:	NA
Services Provided:	Researched prior art related to video conferencing systems.
Dates	May 2016 – March 2017

Expert Engagement:

Type of Matter:	Patent Infringement and Trade Secret Cases
Law Firm:	Russ August & Kabat
Case Names:	VIA Technologies, Inc., et al. v. ASUS Computer International, Inc.Case No. 5:14-cv-03586-BLF Supported VIA Technologies.

Services Provided:	Analyzed hardware infringement of USB and PCIE drivers. Analyzed trade secrets theft of the same hardware. Provided written statements and oral testimony. I provided a written opinion, defended my opinions in three depositions and presented our positions at an arbitration hearing.
Dates	June 2015 – August 2017

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	CALDWELL CASSADY CURRY P.C.
Case Names:	Smartflash LLC, et al. v Google Inc., et al., Case No. 6:14-cv-435- KNM
Services Provided:	Analyzed Google in-app purchase client-server software.
Dates	January 2015 – November 2015

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Orrick, Herrington & Sutcliffe
Case Names:	Certain Consumer Electronics and Display Devices with Graphics Processing and Graphics Processing Units Therein Nvidia v. Qualcomm, Samsung, Imagination Inv. No. 337-TA-932 Supported Nvidia
Services Provided:	Analyzed thread execution and video processing in graphics integrated circuits.
Dates	December 2014 – May 2015

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	CALDWELL CASSADY CURRY P.C.
Case Names:	Smartflash LLC, et al. v Apple Inc., et al., Case No. 6:13-cv-447-MHS-KNM Supported Smartflash
Services Provided:	Analyzed Apple in-app purchase client-server software.
Dates	June 2014 – August 2014

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Young Basile Hanlon & MacFarlane P.C. Durie Tangri
Case Names:	Narada Systems, LLC v. Tabula Inc. Case No. 6:13-cv-336-LED Supported Tabula Inc.
Services Provided:	Analyzed prior art related to FPGA switch and routing fabrics.
Dates	February 2014 – April 2014

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Morrison Foerster
Case Names:	Intellectual Ventures I & II, LLC et al. v. Altera Corporation et al. Case No. 10cv 01065-LPS Supported Altera and Xilinx
Services Provided:	Analyzed prior art related to systems on a chip.
Dates	September 2012 – May 2014

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	McKool Smith, Dallas Texas
Case Names:	ParkerVision Inc. Inc. v. Qualcomm Incorporated. Civil Action No. 3:11-cv-719-J-37-TEM Supported ParkerVision
Services Provided:	Reviewed schematics related to the down conversion of a radio frequency signal to a base band signal.
Dates	September 2012 – May 2013

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	McKool Smith, Dallas Texas
Case Names:	WI-LAN INC., v. HTC CORPORATION, HTC AMERICA, INC., and EXEDEA, INC.

	Civil Action No. 2:11-CV-68 Supported WiLAN
Services Provided:	Investigated patent infringement related to the decoding and encoding of broadband transmission. I investigated VHDL, Verilog, C, and C++ source code related to Orthogonal Frequency Division Multiplexing and SC-OFDMA
Dates	September 2012 – August 2013

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Orrick, Herrington & Sutcliffe
Case Names:	Lantiq Deutschland GmbH v. Ralink Technology Corp., et al.
	Civil Action No. 11-cv-00234-EJD Supported Ralink
Services Provided:	Investigated patent infringement related to fractional phase lock loops and integer phase lock loops embedded in Ethernet and DSL circuits.
Dates	May 2012 – September 2012

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Morrison and Foerster
Case Names:	Sonic v. Arteris UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF CALIFORNIA Case No. 11-CV-05311 MEJ
	Supporting Sonic
Services Provided:	Investigating infringement of hardware patents related to integrated circuit interconnections.
Dates	March 2012 – February 2013

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Quinn Emanuel
Case Names:	MotionPoint v. Transperfect Supported MotionPoint
Services Provided:	Investigated infringement of software patents related to language translation. Offered an opinion regarding MotionPoint's product infringement on the asserted patent and invalidity thereof. Testified at trial in the United States District Court, Northern District of California Oakland Division.
Dates:	August 2012 – July 1 2013

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Faegre Baker Daniels
Case Names:	Honeywell International, Inc, v. Nest Labs Inc., and Best Buy Co. Inc. Case No. 12-cv-299 (SRN/JSM) Supporting Honeywell International
Services Provided:	Investigated infringement of hardware patents related to power stealing.
Dates:	July 2012 – August 2012

Expert Engagement:

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	DLAPiper
Case Names:	MOTOROLA MOBILITY, INC. and GENERAL INSTRUMENT CORP. v. TIVO Inc. UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS Civil Action No. 5:11-00053-DF Supported Motorola
Services Provided:	Investigated infringement of software patents related to Personal Video Recording devices.

Dates: February 2012 – August 2012

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Kellogg, Huber, Hansen, Todd, Evans & Figel. P.L.L.C. Washington D.C.
Case Names: TiVo Inc. v Verizon Communications Inc. et al.
UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS MARSHALL DIVISION
Case No. 2:09-cv-257-DF (E.D. Tex.)

Supported Verizon

Services Provided: Investigated infringement of software patents related to digital video recording.

Dates: April 2012 – June 2012

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: McDermott Will & Emery
Case Names: MotionPoint v. Transperfect
UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
Case No. 4:10-cv-02590-CW (JCS)

Supported MotionPoint

Services Provided: Investigated infringement of software patents related to language translation.

Dates: January 2012 – June 2012

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: DLA Piper LLP
Case Names: Freescale Semiconductor v. Funai Electric, MediaTek Inc., Zoran Corporation
INTERNATIONAL TRADE COMMISSION
Case No. ITC 337-TA-786
Supporting Funai, MediaTek, Zoran.

	Supported Zoran
Services Provided:	None
Dates:	October 2011 – June 2012

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Morrison and Foerster
Case Names:	Altera v. LSI UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF CALIFORNIA Case No. 11-cv-03139 CW Supported Altera
Services Provided:	Investigated infringement of hardware patents related to integrated circuit power management, clock recovery and high-speed bus implementations.
Dates	June 2011 – September 2011

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Jones Day
Case Names:	Nielsen. v comScore Inc. UNITED STATES DISTRICT COURT EASTERN DISTRICT OF VIRGINIA ALEXANDRIA DIVISION Case No. 1:11-cv-290-LMB-TRJ Supported Nielsen
Services Provided:	Investigated infringement of software patents related to the collection of demographic information from survey panels and automated user identification. I investigated C, C++, C#, Java and SQL code residing on servers and personal computers.
Dates	June 2011 – September 2011

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Kellogg, Huber, Hansen, Todd, Evans & Figel. P.L.L.C. Washington D.C.
Case Names:	Active Video Networks Inc. v Verizon Communications Inc. UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS MARSHALL DIVISION Case No. 2:10-cv-248-RAJ-FBS

Supported Verizon

Services Provided: Investigated infringement of software patents related to communications between the set-top box and content providing servers at the communications head-end.

Dates December 2010 – March 2011

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.C. Washington D.C.
Case Names: HTC v. Apple Computers in the matter of Certain Portable Electronic Devices and Related Software.
UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON D.C.
Case 337-TA-721

Supported HTC

Services Provided: Investigated infringement of software patents related to power management in smart phones.

Dates November 2010 – January 2011.

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Kellogg, Huber, Hansen, Todd, Evans & Figel. P.L.L.C. Washington D.C.
Case Names: Verizon Communications Inc. in the matter of Certain Digital Set-Top Boxes
UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON D.C.
Case 337-TA-712
Case 337-TA-717

Supported Verizon

Services Provided: Investigated infringement of software patents related to communications between the set-top box and content providing servers at the communications head-end.

Dates June 2010 – September 2010

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: WiLAN Inc. v. Acer, et. al.

THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

Civil Action No. 2-07CV-473 (E.D. Tex.)
WiLAN Inc. v. Acer, et. al.

Civil Action No. 2-07CV-473 (E.D. Tex.)
WiLAN Inc. v. Westell Technologies Inc.

Civil Action No. 2:08-CV-247 (TJW)
WiLAN Inc. v. RESEARCH IN MOTION CORPORATION,
RESEARCH IN MOTION LTD.,
MOTOROLA, INC., UTSTARCOM, INC.,
LG ELECTRONICS MOBILECOMM
U.S.A., AND LG ELECTRONICS, INC.,

Case No. 5:08-CV-04555-JW
WiLan v. Intel

Supported WiLAN

Services Provided: These cases consisted of 802.11a,b,g,n and Bluetooth investigations. In as much I investigated infringement of hardware patents related to the decoding and encoding of broadband transmission. Investigated Verilog, C, and C++ source code related to Bluetooth piconets, Orthogonal Frequency Division Multiplexing and Complementary Code Key incorporated in various integrated circuits. In addition to the above investigations, I was deposed and was asked to testify. This case settled before trial.

Dates May 2009 – March 2011

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Jones Day, Palo Alto CA.
Case Names: Agere Systems Inc. and LSI Corp. vs. Xilinx, Inc.
UNITED STATES DISTRICT COURT
SOUTHERN D1STR[CT OF NEW YORK
Case 09 Civ. 9717 (JSR)
Case 09 Civ. 9719 (JSR)

Supported Xilinx

Services Provided: Investigated infringement of hardware patents related to the implementation of Field Programmable Gate Arrays (FPGAs).

Dates February 2010 – April 2010

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Goodwin Procter LLP
Case Names:	MedioStream, Inc. v. Acer, et al. Consolidated Case No. 2:08-CV-369-CE, Eastern District of Texas Supported MedioStream
Services Provided:	Investigated infringement of software patents related to the decoding and encoding of video in Apple Computer products. Investigated C, C++ and Objective C source code in various video transcoding applications.
Dates	July 2009 – October 2010

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Womble Carlyle Sandridge & Rice.
Case Names:	Rembrandt Data Technologies vs. AOL LLC, et. al. THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF VIRGINIA - Alexandria Division C.A. No. 1:08-cv-01009-GBL-IDD Supported Rembrandt Data Technologies.
Services Provided:	Investigated infringement of hardware and software patents related to the transmission of data, voice and video over cable networks. Miguel Gomez performed the following tasks: ▪ Investigated assembly level source code for a V.34 modem physical layer modulation and de-modulation circuit. ▪ Gave testimony at deposition.
Dates	April 2009 – June 2009

Expert Engagement:

Type of Matter:	Patent Infringement Case
Law Firm:	Kellogg, Huber, Todd, Evans & Figel Washington D.C.
Case Names:	Rembrandt Data Technologies vs. Comcast, et. al. UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS MARSHALL DIVISION 2:06-cv-00047-TJW-CE Rembrandt Data Technologies vs. Rembrandt Data Technologies vs. SHARP CORPORATION and SHARP ELECTRONICS CORP.

Case No. 2:06CV507 (LED)
Rembrandt Data Technologies vs.
CHARTER COMMUNICATIONS, INC.,)
CHARTER COMMUNICATIONS)
OPERATING, LLC, and COXCOM, INC.

2:06-cv-00223-TJW-CE
Rembrandt Data Technologies vs.
CHARTER COMMUNICATIONS, INC,
CHARIER COMMUNICATIONS
OPERATING, LLC, COX
COMMUNICATIONS, INC, COXCOM,
INC, COX ENTERPRISES, INC., CSC
HOLDINGS, INC, and CABLEVISION
SYSTEMS CORPORATION,

THE UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK
Case No. 02-41729 (REG)
Rembrandt Data Technologies vs.
Adelphia Communications Corporation;)
Century-TCI California, LP;)
Century-TCI California Communications, LP;)
Century-TCI Distribution Company, LLC;)
Century-TCI Holdings, LLC;)
Parnassos, LP;)
Parnassos Communications, LP;)
Parnassos Distribution Company I, LLC;)
Parnassos Distribution Company II, LLC;)
Parnassos Holdings, LLC;)
Western NY Cablevision, LP

Supported Rembrandt Data Technologies.

Services Provided: Investigated infringement of hardware and software patents related to the transmission of data, voice and video over cable networks.

Miguel Gomez performed the following tasks:

- Investigated Verilog source code used to implement a modem physical layer modulation and de-modulation circuit.
- Investigated C and C++ software used to implement cable modems.

Dates September 2008 – February 2009

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: Hogan and Hartson, New York NY
Case Names: ProMOS Technologies vs. Freescale Semiconductor Inc.
Case No. 06-788 JJF (D. Del.)

Supported ProMOS

Services Provided: Investigated infringement of hardware logic patents related to cache controllers.

Miguel Gomez performed the following tasks:

- Investigated Verilog source code used to implement a cache controllers in integrated circuits designed and produced by Freescale Technologies.

Dates February 2008 – August 2008

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: i4i Limited Partnership vs. Microsoft., et al.

THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION
Case No. 6:07-CV-113-LED

Supported i4i.

Services Provided: Investigated infringement of software patents related to the organization of XML data.

Miguel Gomez performed the following tasks:

- Investigated C and C++ software code that read, displayed and managed XML constructs in Microsoft office software products.

Dates November 2007 – August 2008

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: Rembrandt Data Technologies vs. Comcast., et al.
MDL Docket No. 07-mdl-1848 GMS

Supported Rembrandt Data Technologies.

Services Provided: Investigated infringement of software and hardware patents related to the transmission of data, voice and video over cable networks.

Miguel Gomez performed the following tasks:

- Investigated C and C++ software code in the cable modem management layer that controlled data flows through the various chip sets of the cable modem.
- Investigated DSP code that provided data connection services in cable modems.

Dates May 2007 – July 2007

Expert Engagement:

Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: Samsung vs. Ericsson et al.,

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.
Case No. 337-TA-583
Case No. 337-TA-577

Supported Ericsson.

Services Provided: Investigated infringement of patents in cell phones.

Miguel Gomez performed the following tasks:

- Investigated C and C++ software code that controlled the power management and clock calibrations.
- Reviewed hardware description language code and DSP firmware to trace the control flow from the managing software down to the hardware registers.
- Wrote an expert report that documented the findings.
- Acquired and wrote software tools to assist the investigation process.

Dates January 2007 – May 2007

Expert Engagement:
Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: American Video Graphics, L.P. vs. Sony Computer Entertainment America
American Video Graphics, L.P. vs. Hewlett Packard Co., et al.,

Supported American Video Graphics.

Services Provided: Investigated patent infringement in graphic chipsets used in personal computers and game consoles.

Miguel Gomez performed the following tasks:

- Investigated the accused chipsets by examining the hardware code for various sub-modules including the 2D and 3D rendering engines and the frame buffers that connect the graphics processing units to memory devices.
- Wrote claim charts and created exhibits.
- Acquired and wrote software tools to assist the investigation process.

Dates August 2005 – November 2005

Expert Engagement:
Type of Matter: Patent Infringement Case
Law Firm: McKool Smith, Dallas Texas
Case Names: American Video Graphics, L.P. vs. Sony Corporation of America, et al.,
American Video Graphics, L.P. vs. Hewlett-Packard Co., et al.,
American Video Graphics, L.P. v. Electronic Arts, Inc., et al., No. 6:04-CV-398 LED

Supported American Video Graphics.

Services Provided: Patent infringement investigation of computer game software.

Miguel Gomez performed the following tasks:

- Examined C and C++ source code for electronic computer games which ran on Sony, Microsoft and Nintendo game consoles as well as Personal Computers
- Wrote a claim chart and created exhibits.

Dates May 2005 – August 2005

Expert Engagement:

Type of Matter: Patent Infringement
Law firm: Dewey Ballantine, Palo Alto, California
Case Name: Matsushita vs. Texas Instruments

Supported Matsushita.

Services Provided:

- Read and interpreted approximately 50 patents issued to Matsushita for Dewey Ballantine attorneys in their preparation for litigation between Matsushita and Texas Instruments.

Dates: November 2004 – March 2005

Expert Engagement:

Type of Matter: Patent Infringment
Law firm: Wilson Sonsini Goodrich Rosatti
Case Name: Zoran vs MediaTek et, al.

Supported MediaTek.

Service Provided: Offered an opinion as to when a product was ready for patenting per the requirements for an on-sale bar.

Miguel Gomez performed the following tasks:

- Offered an opinion as to whether the product in this was ready to be patented
- Reviewed all available documentation.
- Wrote report and rebuttal to opposition expert report
- Gave testimony at deposition and provided a written opinion at the ITC hearing.

Dates

September 2004 – February 2005

Patents

Issued Patents

7,814,204 Method of and system for analyzing the content of resource requests

7,447,777 Switching system

7,298,746 Method and system for reassembling and parsing patents in a network environment

7,321,926 Method of and system for allocating resources to resource requests

8,412,838 Method of and system for analyzing the content of resource requests

Applications

"System and Method for an array of intelligent inverters"

European: 09747629.5-1242/2291908

US PCT/US2009044033

Also published as: CN102067429A, US2090283129, WO2009140548A3