

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD., and
SAMSUNG ELECTRONICS, AMERICA, INC.,
Petitioners,

v.

FOUR BATONS WIRELESS, LLC,
Patent Owner.

Case IPR2025-00494
Patent 8,073,436

DECLARATION OF DR. KONSTANTINOS PSOUNIS

Signed: _____



Dr. Konstantinos Psounis

June 23, 2025

I. Introduction

1. My name is Konstantinos Psounis. I am over eighteen years of age, of sound mind, and qualified to make the statements set forth in this Declaration. With the exception of the legal principles counsel has supplied to me, all the facts and statements contained herein are within my personal knowledge and are in all respects true and correct.

2. I have been asked by Four Batons Wireless LLC (“Four Batons” or “Patent Owner”) to submit this declaration in response to a Petition in IPR2025-00494 from Samsung Electronics Co. Ltd., and Samsung Electronics, America, Inc., (“Samsung” or “Petitioner”) regarding U.S. Patent No. 8,073,436 (“the ’436 Patent”).

3. I am being compensated for my time at my current standard rate of \$850 per hour for the services that I provide in connection with this case. That compensation is not contingent upon my performance, the outcome of the case, or any issues involved in or related to this case.

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

II. Qualifications

5. I have summarized in this section my educational background, career history, publications, and other relevant qualifications. My full *curriculum vitae* is attached as Exhibit 2014 to this declaration.

6. I am a Professor and prior Associate Chair of Electrical and Computer Engineering and Professor of Computer Science at the University of Southern California. I joined the University of Southern California in 2003, after completing my PhD at Stanford University as a Stanford Graduate Fellow.

7. My professional career has spanned more than 20 years. As set forth in Exhibit 2014, I have extensive experience in the field of networked distributed systems, including the Internet and the web, Wi-Fi and cellular wireless systems, spectrum sharing wireless systems, sensor and IoT wireless systems, mobile ad hoc and delay tolerant wireless systems, data centers and cloud systems, peer to peer systems, and autonomous vehicles/drones systems.

8. I have published more than 100 technical papers in these fields, which have been cited tens of thousands of times. I have also been awarded numerous grants and significant funding from the government and industry leaders to advance these fields. As a result, I have been named an Institute of Electrical and Electronics Engineers (IEEE) Fellow, the highest grade of membership, for “fundamental

contributions in the theory and practice of wireless networks”, and a Distinguished Member of the Association of Computing Machinery (ACM).

9. Throughout my career, I have analyzed, designed, and developed efficient networked distributed systems for the Internet and the Web, Wi-Fi and cellular wireless systems, spectrum sharing wireless systems, sensor and IoT wireless systems, mobile ad hoc and delay tolerant wireless networks, data centers and cloud systems, peer to peer systems, and autonomous vehicles/drones systems. As such, I have acquired extensive expertise in the analysis and development of those systems and associated products.

10. I have extensive experience with and made contributions specifically towards analyzing and designing efficient Wi-Fi, cellular and other wireless systems. In particular, I have received multiple funding awards from the National Science Foundation (NSF), the leading governmental agency for funding computer engineering and computer science research, to work on wireless systems, including Wi-Fi systems. I have also received multiple funding awards from the industry leaders in the area of networking and in particular wireless networking, to work on these systems. I have published several papers in the most selective academic journals and conferences on wireless systems. I have also been the faculty in charge of the entire networking curriculum at the Electrical and Computer Engineering

department at USC for more than a decade and teach networking classes and in particular the graduate wireless networking class yearly.

11. I also have extensive practical experience with networked distributed systems. For example, I was a co-founder of SpaceMUX, Inc. (whose IP was later acquired by Quantenna Communications, Inc.), where I designed and developed systems to increase the speed of wireless networked systems using modern wireless networking technologies and techniques. Also, I was the Technology Architect for Fineground Networks (later acquired by Cisco Systems, Inc.), where I designed and developed systems to accelerate the delivery of content over the World Wide Web. In addition, for over 20 years both at Stanford University and at the University of Southern California I have designed and implemented efficient algorithms, protocols and systems for a variety of distributed networked systems, and I have consulted for industrial leaders, and produced prototype systems. I have also applied for and been granted numerous patents, which are owned by network industry leaders and prestigious academic institutions.

12. In sum, I have extensive experience in and familiarity with the fields of networked distributed systems and in particular with wireless networking systems including Wi-Fi and cellular wireless systems, and extensive experience and contributions towards the analysis, design and implementation of such systems.

III. Materials Considered

13. Among the materials I have reviewed in forming my opinions are the '436 Patent, its prosecution history, as well as the patents, references, and other materials cited in this expert declaration.

14. I have also reviewed the Petition and its exhibits, including the declaration of Michael Kotzin, Ph.D. (Exhibit 1002).

IV. Legal Principles

15. I am not a lawyer. In forming my opinions as set forth in this Declaration, I have relied upon legal principles supplied to me by attorneys for Four Batons. In forming my opinions, I have not relied upon Four Batons' attorneys for any purpose other than the following legal principles.

A. Claim Construction

16. I understand that determining whether a patent claim is valid requires a two-step analysis. First, the claim must be construed. Second, the properly construed claim must be compared to the prior art.

17. With respect to the first step, I understand that claims are construed from the perspective of a person of ordinary skill in the art ("POSITA") at the time of the purported invention. I understand that, absent a disclaimer or express definition, claim terms are given their plain and ordinary meaning to a POSITA in view of the specification and file history and the knowledge of a POSITA. Unless

otherwise noted, I have applied what I consider to be the plain and ordinary meaning of all terms as understood by a POSITA at the time of the invention.

B. Anticipation

18. I understand that, although not expressly disclosed, subject matter may be inherently disclosed in a prior art reference where that subject matter is necessarily present in the subject matter disclosed and would be understood to be so by those of ordinary skill in the art. I understand that the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.

19. I understand that a claim is invalid if each and every element of the claim is disclosed in a single prior art reference with the elements arranged as specified in the claim, either expressly or inherently. I understand that invalidity based on the disclosure of a single prior art reference in this manner is called anticipation.

C. Obviousness

20. I understand that a claim would have been obvious under 35 U.S.C. § 103 if one or more prior art references disclose every claim limitation in such a way so as to render the claim, as a whole, obvious to a person of ordinary skill in the art at the time the purported invention was made.

21. In determining whether or not a patented invention would have been obvious, the following factors should be considered: (a) the scope and content of the prior art; (b) the differences between the prior art and the claims at issue; (c) the level of ordinary skill in the art; and (d) whatever “secondary considerations” may be present.

22. I understand that certain “secondary considerations” may be relevant in determining whether or not an invention would have been obvious, and that these secondary considerations may include commercial success of a product using the invention, if that commercial success is due to the invention; long-felt but unsolved need for the invention; evidence of copying of the claimed invention by others; industry acceptance; initial skepticism of the invention; failure of others to solve the problem; praise of the invention by others; the taking of licenses under the patents by others; and simultaneous invention by others (which may be an indication that the claimed invention was the result of ordinary skill in the art).

23. I understand that a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. While multiple prior art references or elements may, in some circumstances, be combined to render a patent claim obvious, I understand that I should consider whether there is an apparent reason to combine the prior art references or elements in the way the patent claims. To determine whether such an

apparent reason exists to combine the prior art references or elements in the way a patent claims, it will often be necessary to look to the interrelated teaching of multiple patents, to the effects of demands known to the design community or present in the marketplace, and to the background knowledge possessed by a person having ordinary skill in the art.

24. I also understand that when the prior art teaches away from combining prior art references or certain known elements, discovery of a successful means of combining them is more likely to be non-obvious. A prior art reference may be said to teach away from a patent when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the patent or would be led in a direction divergent from the path that was taken by the patent.

25. I also understand that it is not permissible to use hindsight in assessing whether a claimed invention is obvious. Rather, I understand that, to assess obviousness, you must place yourself in the shoes of a person having ordinary skill in the relevant field of technology at the time the inventions were made who is trying to address the issues or solve the problems faced by the inventor and ignore the knowledge you currently now have of the inventions.

26. I also understand that there are numerous ways in which to articulate the legal standard for obviousness, including: (1) combining prior art elements according to known methods to yield predictable results, (2) simple substitution of

one known element for another to obtain predictable results, (3) use of a known technique to improve similar devices (methods, or products) in the same way, (4) applying a known technique to a known device, method, or product ready for improvement to yield predictable results, (5) choosing from a finite number of identified, predictable solutions with a reasonable expectation of success, (6) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art, and (7) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

D. Person of Ordinary Skill in the Art

27. I understand that the meaning of claim terms and a patent's validity are to be determined from the vantage point of one of ordinary skill in the art at the time of the invention (a "POSITA"). In determining who would be one of such ordinary skill, I understand it is appropriate to consider criteria such as: (a) the type of problems encountered in the art; (b) prior art solutions to those problems; (c) the rapidity with which innovations are made; (d) the sophistication of the technology; and (e) the education level of active workers in the field.

V. The Level of Ordinary Skill in the Art

28. For the purposes of this declaration supporting the Patent Owner's Preliminary Response, I have been asked to apply the same POSITA definition as Dr. Kotzin and assume that a POSITA "would have had a bachelor's degree in electrical engineering, computer science, or a similar field and two years of experience in the design of wireless communication technology." EX1002 paragraph 34. I understand that if the Petition is instituted then I will have the opportunity to propose my own definition of a POSITA.

VI. Analysis

29. I have been asked to opine on a limited number of issues for the purpose of supporting the Patent Owner's Preliminary Response. I understand that if the Petition is instituted, then I will have the opportunity to submit additional analysis on these and other issues.

A. [Claim 1] "having said mobile control use of said interfaces by using a second interface, during a silent period of a second application running on said mobile and using said second interface, to support a first application running on said mobile and using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application"

30. I have been asked to provide opinions on the Petition Grounds as applied to the '436 Patent Claim 1 limitation "having said mobile control use of said interfaces by using a second interface, during a silent period of a second application

running on said mobile and using said second interface, to support a first application running on said mobile and using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application”.

31. The Petition and Dr. Kotzin are relying on Weisshaar paragraph [0051] as disclosing concurrently using two interfaces to support an application. Pet. at 24-25; EX1002 paragraphs 223-224. I disagree with that interpretation of Weisshaar.

32. The Petition and Dr. Kotzin seem completely reliant on a single sentence: “the connection manager manages multiple interfaces and reports concurrent use of more than one interface, either by the same or different applications.” The sentence is strangely worded, and Dr. Kotzin appears to have interpreted it as Weisshaar teaching that multiple interfaces may be concurrently used by the same application. However, what the sentence says is that the connection manager (1) “manages multiple interfaces” and (2) “reports concurrent use of more than one interface, either by the same or different applications.” EX1007 [0051]. In light of the rest of the specification, a POSITA would have understood that to mean that it is reporting use of interfaces regardless of whether that use is by the application requesting the report or a different application.

33. For example, Weisshaar paragraph [0055] explains that “an application of FIG. 3 could request that the connection manager 336 notify it when a

communication interface meeting certain criteria becomes available. The communication interface could be any communication interface described in reference to FIG. 2. It should be noted that the applications may have varying requirements which could be met by different interfaces, while a number of different communication interfaces may be acceptable for a given application.” A POSITA would understand from this that the applications of Weisshaar request that the connection manager report to them on the usage and availability of satisfactory interfaces, and the connection manager reports not just on usage by the requesting application, but by different applications as well.

34. Further review of Weisshaar confirms my interpretation. I note that there is not a single embodiment of Weisshaar in which multiple interfaces are used concurrently to support the same application. Furthermore, the only other place I see the word “concurrent” used in the Weisshaar is in Claims 9, 19, and 21, all of which recite concurrent transmission on a second interface to support a second application (not two interfaces supporting one application). If Weisshaar was teaching using multiple interfaces concurrently to support the same application, then I would have expected to see that represented in at least some of the embodiments and claims, rather than just in passing in a strangely worded sentence.

35. Even if Dr. Kotzin were correct about his interpretation of that sentence from Weisshaar paragraph [0051], I still do not agree that Ground 1 would render

obvious this limitation. For example, the limitation recites “support[ing] a first application running on said mobile and using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application.” Dr. Kotzin’s analysis does not identify a relevant first or second application, much less a second interface used to support a first application during a silent period. *See* EX1002 paragraphs 222-229.

B. [Claims 15 and 19] “having said mobile control processes of said mobile during silent periods based on said mobile running a non-real-time application thereon or a real-time application thereon” / “having said mobile perform certain processes based on: a) if it is running a real-time application and it is stationary” / said mobile being configured to monitor applications running on it, including real time or non real time nature of said applications”

36. I have been asked to provide opinions on the Petition Grounds as applied to the ’436 Patent Claim 15 limitations “having said mobile control processes of said mobile during silent periods based on said mobile running a non-real-time application thereon or a real-time application thereon” and “having said mobile perform certain processes based on: a) if it is running a real-time application and it is stationary” and the Claim 19 limitation “said mobile being configured to monitor applications running on it, including real time or non real time nature of said applications”.

37. The Petition and Dr. Kotzin are relying on Bahl to satisfy this limitation. Pet. at 21, 30-31, 53, 62; EX1002 paragraphs 245-141, 350, 352-354, 389. I disagree.

38. The '436 Patent (which relates to the use of silent periods) distinguishes real-time from non-real-time applications in part based on whether the stream of data for the application is likely to be continuous, or whether it will be “bursty and thus there may appear intervals when the devices can take a momentary pause” that can be used as a silent period. EX1001 at 2:50-62.

39. Bahl never directly addresses the concept of real-time applications, nor does it attempt to distinguish real-time from non-real-time applications. Dr. Kotzin does not address the differences either, but instead relies on what he refers to as Bahl “contemplat[ing] the throughput and application throughout requirements of various networks.” EX1002 paragraphs 247-248. However, throughput alone is not a sufficient indicator of whether an application is real-time or not. The '436 Patent points to applications such as voice over IP (VoIP) as an example of a real-time application. EX1001 at 15:25-27. VoIP uses minimal throughput—voice communication typically involves minimal data overall, but the data generally needs to be transmitted and received continuously, and it usually requires minimal latency in order to provide the ability to carry on a normal conversation. Because VoIP applications are designed to communicate continuously and minimize latency, they

are not “bursty” and are unlikely to have intervals sufficient to be used as silent periods.

40. Real-time applications tend to be more focused on overall quality of service (“QoS”), rather than just throughput. Consistent with that, the ’436 Patent teaches embodiments focusing on “QoS enhancement if it is running a real-time application.” EX1001 at 3:63-4:4. QoS can include many factors, such as bandwidth, delay, and error rate in correctly sending or receiving data. For example, in a wireless system, a high signal to noise ratio or deterioration in a radio signal could lead to an error rate that would be unacceptably high for applications like VoIP, potentially leading to delays in receiving audio or intermittent dropping of audio. This could occur even if the overall bandwidth was still sufficient for the application.

41. On the other hand, you could have applications which preferably have high throughput but are less susceptible to delays and error rate. For example, a web browser application used to download large files for later use can often tolerate delays and intermittent errors as long as the overall throughput is sufficient to finish downloading the files before they will be needed.

- C. **[Claim 19] “wherein said mobile is configured to switch between modes of operation of based on said application awareness and said situation awareness, including to switch between one or more of the following modes of operation[:] QoS enhancement through multiple address mode, network discovery mode, energy saving mode, and chat with devices mode”**

42. I have been asked to provide opinions on the Petition Grounds as applied to the '436 Patent Claim 19 limitation “wherein said mobile is configured to switch between modes of operation of based on said application awareness and said situation awareness, including to switch between one or more of the following modes of operation[:] QoS enhancement through multiple address mode, network discovery mode, energy saving mode, and chat with devices mode”.

43. The Petition and Dr. Kotzin are relying on what they describe as Bhal’s “switching into an energy conservation mode based on the needs of the applications.” Pet. at 62-64; EX1002 paragraphs 391-402. However, a POSITA would have understood that the disclosure of switching into a single mode would not meet this claim limitation, at least because the claim describes switching between several modes, and not just switching into a single mode. *See* EX1001 at Figure 4, 3:17-32, 4:37-44, 9:16-27.