

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ERICSSON INC. AND TELEFONAKTIEBOLAGET  
LM ERICSSON (“Ericsson”),  
Petitioner

v.

INTELLECTUAL VENTURES II LLC (“IV”),  
Patent Owner

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Patent 7,787,431

Title: METHODS AND APPARATUS FOR MULTI-CARRIER  
COMMUNICATIONS WITH VARIABLE CHANNEL BANDWIDTH

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**DECLARATION OF ZYGMUNT J. HAAS, PH.D.**  
**UNDER 37 C.F.R. § 1.68**

I, Zygmunt Haas, do hereby declare:

1. I am making this declaration at the request of Ericsson Inc. and Telefonaktiebolaget LM Ericsson (“Ericsson”) in the matter of the *Inter Partes* Review of U.S. Patent No. 7,787,431 (“the ’431 patent”) to Xiaodong Li, et al.
2. In the preparation of this declaration, I have studied:
  - (1) The ’431 Patent, ERIC-1001;
  - (2) U.S. Application Publication No. 2002/0055356 (“Dulin”), ERIC-

1002;

- (3) U.S. Patent No. 7,782,750 (“Yamaura”), ERIC-1003;
- (4) U.S. Patent No. 7,426,175 (“Zhuang”), ERIC-1004;
- (5) I. Hwang *et al.*, IEEE C802.16d-04/19, “A New Frame Structure for Scalable OFDMA Systems,” pp. 0-12, March 11, 2004, (“Hwang”) ERIC-1005;
- (6) R. van Nee and R. Prasad, *OFDM for Wireless Multimedia Communications*, Artech House, pp. 119-154, 2000, ERIC-1006;
- (7) *Curriculum Vitae* of Expert, ERIC-1007;
- (8) A. Kerr, IEEE C802.16d-04/36r2, “Additional Preamble Definitions for 802.16d OFDM-256,” March 11, 2004, (“Kerr”) ERIC-1009;
- (9) U.S. Patent No. 5,097,499 (“Cosentino”), ERIC-1013;
- (10) U.S. Patent No. 6,904,283 (“Li”), ERIC-1014;
- (11) K. Pahlavan and P. Krishnamurthy, *Principles of Wireless Networks, A Unified Approach*, pp. 319-347 and 553-555, Prentice Hall (2002), (“Pahlavan”) ERIC-1015;
- (12) P. Joo, et al., IEEE C802.16d-04/25, “The uplink subchannelization preamble with lower PAPR,” pp. 0-3, March 11, 2004 (“Joo”), ERIC-1016; and
- (13) J. Liebetreu, et al., IEEE C802.16-04/51r1, “AAS enhancements for 1x Scalable PHY,” pp. 1-16, March 15, 2004 (“Liebetreu”), ERIC-1017.

3. In forming the opinions expressed below, I have considered:

- (1) The documents listed above, and
- (2) My knowledge and experience based upon my work in this area as described below.

4. I am familiar with the technology at issue. I am also aware of the state of the art at the time the application resulting in the '431 patent was filed. The earliest priority date is May 1, 2004. Based on the technologies disclosed in the '431 patent, I believe that one of ordinary skill in the art would include someone who has a B.S. degree in Electrical Engineering, Computer Engineering, Computer Science, or equivalent training, as well as three to five years of technical experience in the field of digital communication systems, such as wireless cellular communication systems and networks. Unless otherwise stated, when I provide my understanding and analysis below, it is consistent with the level of one of ordinary skill in these technologies at and around the priority date of the '431 patent.

## **I. QUALIFICATIONS**

5. I am a Professor and Distinguished Chair in Computer Science at the University of Texas at Dallas. I am also Professor Emeritus at the School of Electrical and Computer Engineering at Cornell University. In addition, I provide technical consulting services in intellectual property matters, during which I have written expert reports and provided deposition and trial testimony involving

wireless communication technologies.

6. My academic credentials include a Bachelor of Science Degree in Electrical Engineering, *summa cum laude*, from Technion (IIT), Israel, in 1979 and a Master of Science Degree in Electrical Engineering, *summa cum laude*, from Tel-Aviv University, Israel, in 1985. I subsequently authored the thesis titled “Packet Switching in Fiber-Optic Networks” as part of earning my Ph.D. in Electrical Engineering from Stanford University in 1988.

7. My professional background and technical qualifications are stated above and are also reflected in my *Curriculum Vitae*, which is attached as ERIC-1007. I am being compensated at a rate of \$375.00 per hour, with reimbursement for actual expenses, for my work related to this Petition for *Inter Partes* Review. My compensation is not dependent on and in no way affects the substance of my statements in this Declaration.

8. I have worked or consulted for about 35 years in the field of Electrical Engineering. My primary focus has been on communication and networking systems, with an emphasis on wireless communication networks. I have authored and co-authored numerous technical papers and book chapters related to wireless communication networks. I hold eighteen patents in the fields of high-speed networking, wireless networks, and optical switching.

**9.** My employment history following my graduation from Stanford University began at the Network Research Department of AT&T Bell Laboratories in 1988. At AT&T Bell Laboratories, I pursued research on wireless communications, mobility management, fast protocols, optical networks, and optical switching. During my tenure at AT&T, I also worked for the AT&T Wireless Center of Excellence, where I investigated various aspects of wireless and mobile networks.

**10.** In 1995, I joined the faculty of the School of Electrical & Computer Engineering at Cornell University as a Professor. At Cornell, I headed the Wireless Networks Lab, which is an internationally recognized research group with extensive contributions in the area of wireless communication systems and networks. In 2013, I retired from Cornell with the title of Emeritus professor and joined the Computer Science Department at the University of Texas at Dallas with the title of Professor and Distinguished Chair in Computer Science. At Cornell and at the University of Texas, I have taught dozens of courses related to computer networking and wireless communications. I have also served on various committees for the benefit of the scientific community.

**11.** I am a member of a number of professional societies, including the Institute of Electrical and Electronic Engineers (IEEE) and the Association for

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