

**UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

APPLE INC.,

Petitioner,

v.

ANDREA ELECTRONICS INC.,

Patent Owner.

Patent No. 6,049,607

Issued: April 11, 2000

Filed: Sept. 18, 1998

Inventors: Joseph Marash, *et al.*

Titles: INTERFERENCE CANCELING METHOD AND APPARATUS

IPR2017-00628

**DECLARATION OF BERTRAND HOCHWALD REGARDING  
U.S. PATENT NO. 6,049,607**

Petitioner Apple Inc

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## **I. INTRODUCTION**

### **A. Engagement**

1. I have been retained by counsel for Apple Inc. as an expert witness in the above-captioned proceeding. I have been asked to provide an opinion regarding the patentability of certain claims in U.S. Patent No. 6,049,607 (“the ’607 patent”). I have been asked to provide a discussion of the meaning of certain words and phrases in the claims of the ’607 patent, to provide a description of state of the art of the technology described in the ’607 patent, and to analyze various references that I understand are prior art to this patent.

### **B. Background and Qualifications**

2. In 1995 I received a Ph.D. in Electrical Engineering from Yale University. My PhD work involved the analysis and processing of electromagnetic and audio signals for the estimation of the location of electromagnetic and audio sources. In 1993 I received an M.A. in Statistics from Yale University. My primary area of study was Statistical Signal Processing. I received an M.S. in Electrical Engineering from Duke University in 1986, and a B.S. in Engineering from Swarthmore College in 1984.

3. I have twenty years of combined industry and academic experience in the research and design of systems for signal processing, and wireless and wireline communications.

4. My most recent appointment, starting in 2011, is with the University of Notre Dame, where I am currently a Freimann Chaired Professor of Electrical Engineering. I teach both graduate and undergraduate classes in Communication Systems and in Signals and Systems, where the emphasis is on the processing of analog and digital signals. My primary areas of research include communication systems, radio-frequency circuits, and signal design and processing. I advise graduate students who are attaining Ph.D. degrees through research and coursework.

5. Prior to Notre Dame, I worked from 2005-2010 at Beceem Communications, a cellular wireless communication chipset start-up company in Santa Clara, California, where I was Chief Scientist and Vice President of Systems Engineering. I was an integral part of the chipset development team. Beceem was bought by Broadcom Corporation in 2010 and no longer exists as a separate company.

6. Prior to Beceem, I worked from 1996-2005 at Lucent Bell Laboratories in New Jersey, where I was as a Distinguished Member of the Technical Staff doing research into communications systems and multiple-antenna systems. As a result of my research, I obtained many patents and wrote numerous publications across a variety of areas in communication theory, information theory, and circuit design.

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