

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.
Petitioner

v.

DSS TECHNOLOGY MANAGEMENT, INC.
Patent Owner

Case IPR2015-00373
Patent 6,128,290

DECLARATION OF DR. JING HU

APL 1014
IPR2015-00373

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I, Dr. Jing Hu, hereby declare as follows:

I. Introduction

1. I am over the age of eighteen (18) and otherwise competent to make this declaration.

2. I have been retained as an expert witness on behalf of APPLE INC. for the above-captioned *inter partes* review (IPR). I am being compensated for my time in connection with this IPR at my standard legal consulting rate, which is \$250 per hour.

3. I understand that this *inter partes* review involves U.S. Patent No. 6,128,290 (“the ’290 patent”), APL 1001, which issued from U.S. Patent Application No. 08/949,999 (“the ’999 application”), filed on October 14, 1997. The ’290 patent names Phillip P. Carvey as the sole inventor. The ’290 patent issued on October 3, 2000, from the ’999 application. It is my understanding that the ’290 patent is currently owned by DSS Technology Management, Inc.

4. In preparing this Declaration, I have reviewed the ’290 patent and considered each of the documents cited herein in light of the general knowledge in the art at the time of the alleged inventions. In formulating my opinions, I have relied upon my experience, education, and knowledge in the relevant art(s). I have also considered the viewpoint of a person of ordinary skill in the art (“POSA”) at the relevant time period.

II. My Background and Qualifications

5. I hold a doctoral degree (PhD) in Electrical and Computer Engineering, granted by University of California, Santa Barbara in 2007, as well as a Master's degree in Electrical and Computer Engineering from Rice University in 2003, and a Bachelor's degree in Precision Instruments from Tsinghua University, Beijing, China in 2001.

6. I worked as a research scientist and embedded software engineer at Cisco Systems, Inc. between the years of 2007 and 2012. At Cisco Systems, I worked on a series of projects that included wide area network optimization, video quality monitoring, and multimedia conferencing systems on digital signal processing parts of enterprise network routers. I designed algorithms, wrote production source code and conducted unit testing on these projects.

7. I have conducted research in both academia and industry for over ten years. My research topics include wireless network optimization, information theory, video compression, and communication over wireless networks. I have published numerous peer-reviewed research papers on these topics. My research paper "Video capacity of Wireless LANs with a multiuser perceptual quality constraint" won Best Paper Award of IEEE Transactions on Multimedia over the years of 2007 to 2009. Please see my *Curriculum Vitae* (CV) for the list of my

other published research papers. I have been a visiting researcher at University of California, Santa Barbara since early 2013.

8. I am an inventor of four awarded or pending U.S. patents, on topics ranging from wide area network optimization to video quality monitoring in the network and in the endpoints. Please see my CV for the list of my patents and patent applications.

9. I have co-authored a book titled “Rate Distortion Bounds for Voice and Video,” published in the prestigious Foundations and Trends in Communications and Information Theory Series, in February 2014. In this book, my co-author and I teach the current best-performing voice and video codecs for communication over wired, wireless, and cellular networks and present the first rate distortion bounds for voice and video that lower bound the operational rate distortion performance of these codecs.

10. In the course of my research and product development related to data communication over wireless and wired networks, I worked extensively with communication protocols across various layers of the networks, including, for example, IEEE 802.11, Asynchronous Transfer Mode (ATM), Ethernet, and High-Level Data Link Control (HDLC) on the data link layer. I have both designed data communication algorithms and developed relevant products that function over and/or interoperate with the networks governed by these protocols.

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