

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

Zentian Limited
Patent Owner.

Case IPR2023-00037
Patent No. 10,971,140

**DECLARATION OF DELIANG WANG, Ph.D., IN SUPPORT OF
PATENT OWNER'S PRELIMINARY RESPONSE**

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I, DeLiang Wang, Ph.D, do hereby declare as follows:

I. Introduction

A. Engagement

1. I have been retained by Patent Owner Zentian Limited (“Zentian” or “Patent Owner”) to provide my opinions with respect to Zentian’s Preliminary Response to the Petition in *Inter Partes* Review proceeding IPR2023-00037, with respect to U.S. Pat. 10,971,140. I am being compensated for my time spent on this matter. I have no interest in the outcome of this proceeding and the payment of my fees is in no way contingent on my providing any particular opinions.

2. As part of this engagement, I have also been asked to provide my technical review, analysis, insights, and opinions regarding the materials cited and relied upon by the Petition, including the prior art references and the supporting Declaration of Mr. Schmandt.

3. The statements made herein are based on my own knowledge and opinions.

B. Background and qualifications

4. My full qualifications, including my professional experience and education, can be found in my Curriculum Vitae, which includes a complete list of my publications, and is attached as Ex. A to this declaration.

5. I have spent my professional and academic career as a researcher in the field of speech processing and machine learning (including deep learning). I am currently a University Distinguished Scholar and Professor in the Department of Computer Science and Engineering at Ohio State University.

6. I received B.S. in 1983 and M.S. in 1986 from Peking (Beijing) University, both in computer science. I received a Ph.D. in computer science in 1991 from the University of Southern California.

7. I have received numerous awards and honors, including the U.S. Office of Naval Research Young Investigator Award, the Best Paper Awards from the Institute of Electrical and Electronics Engineers (“IEEE”) Computational Intelligence Society and the IEEE Signal Processing Society, and the Helmholtz Award from the International Neural Network Society. I am Co-Editor-in-Chief of *Neural Networks*, a premier journal in the field of neural networks and deep learning, and also served as President of the International Neural Network Society.

8. I am an IEEE Fellow and an ISCA Fellow. I have published 175 articles in major scientific journals and more than 250 papers in leading conference proceedings. In addition, I have supervised 29 graduate students who earned their PhDs in computer science and engineering, including those currently employed by

leading IT companies performing ASR and related work. More details are given in the attached *curriculum vitae*.

9. I am a recognized expert in the field of robust ASR (automatic speech recognition) technology, including scientific methods, and algorithm development and testing. Robust ASR aims to develop ASR algorithms that can suppress, or remain unaffected by, background interference (such as noise). ASR algorithms developed in my laboratory have been recognized as some of the best in the world; our algorithms achieved the highest recognition rate in the CHiME-2 challenge in 2016, in the CHiME-4 challenge in 2020, and the LibriCSS challenge in 2021. My research contributions and achievements in the fields of speech processing were featured in the March 2017 issue of *IEEE Spectrum*, the most circulated technical magazine in the world. I am one of the most published authors in peer-reviewed scientific journals in the fields of speech and audio processing.

C. Materials considered

10. In the course of preparing my opinions, I have reviewed and am familiar with the '140 patent, including its written description, figures, and claims. I have also reviewed and am familiar with the Petition in this proceeding, the supporting Declaration of Mr. Schmandt, and the relied upon prior art, including Jiang and Chen. I have also reviewed the materials cited in this declaration. My opinions are

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