UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

In re: Inter Partes Review of: :

U.S. Pat. No. 7,116,710   :

U.S. Pat. No. 7,421,032   :

U.S. Pat. No. 7,421,781   :

and U.S. Pat. No. 8,284,833   :

Inventor: Hui Jin, et al   :   IPR No. Unassigned

Assignee: California Institute of Technology

Common Title: **Serial Concatenation of Interleaved Convolutional Codes Forming Turbo-Like Codes**

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Submitted Electronically via the Patent Review Processing System

DECLARATION OF DAVID J.C. MACKAY

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Declaration of David J.C. MacKay

I, David J.C. MacKay, declare as follows:

1.   I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

2.   I have been asked to provide assistance in the *inter partes* review of the following U.S. Patents: i) U.S. Patent No. 7,116,710 ("the '710 Patent"); ii) U.S. Patent No. 7,421,032 ("the '032 Patent"); iii) U.S. Patent No. 7,421,781 ("the '781 Patent"); and iv) U.S. Patent No. 8,284,833 ("the '833 Patent").

3.   As described more fully below, this declaration is a statement of facts with regard to the publication of certain prior art authored or co-authored by me relevant to the '710, the '032, the '781, and the '833 Patents.

4.   I am over the age of 18, have never been convicted of a felony or crime of moral turpitude and am legally competent to make this declaration.

I.   Background and Qualifications

5.   My qualifications are stated more fully in my curriculum vitae attached herewith. Here I provide a brief summary of my qualifications:

6.   I am currently the Regius Professor of Engineering at the University of Cambridge in the United Kingdom. I was formerly Professor of Natural

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Philosophy in the Department of Physics, Cavendish Laboratory at the University of Cambridge.

7.   I hold a Bachelor of Arts in Natural Sciences (Physics and Theoretical Physics) from Trinity College at the University of Cambridge, and a Doctor of Philosophy in Computation and Neural Systems from the California Institute of Technology.

8.   I have been awarded the Melchett Award from the Energy Institute, an Honorary Doctorate from the University of Strathclyde, an Honorary Fellowship of the Chartered Inst. of Building Services Engineers, the Clifford Paterson Lecture of the Royal Society, and the 1999 Communications Society Leonard G. Abraham Prize Paper Award (with R.J. McEliece and J-F. Cheng). I have also been elected a Fellow of the Institution of Civil Engineers, the Institute of Physics, and the Royal Society.

9.   I have authored a book entitled "Information Theory, Inference, and Learning Algorithms" that is relevant to the subject matter of this case. In addition, I have authored or co-authored hundreds of articles in peer-reviewed journals, conference proceedings, texts, industry trade publications, and monographs, including dozens of such publications in the field of Information theory and relevant to the subject matter of this case.

10.   Generally, I am credited with the "re-invention" or "re-discovery" of Gallager codes in 1995, with Radford M. Neal. The original work by Robert Gallager occurred from 1960 to 1963 at MIT. He developed the first description of low density parity check codes ("LDPC"). My work reintroduced the concept in the context of modern communications systems.

11.   I was an active contributor and collaborator in the community that included the inventors and subject matter of the '710; '032; '781; and '833 patents before and after the time of the alleged invention in May 2000.   I conducted research upon which these patents are based. Furthermore, I attended talks given by Dr. Robert McEliece, whom I know from my graduate studies at the California Institute of Technology.   The talks included the 1998 and 1999 Allerton Conferences held by the University of Illinois Urbana-Champagne in Allerton, Illinois and the August 1999 IMA conference at the University of Minnesota.

12.   I have been retained by the law firm of Baker Botts L.L.P., counsel for the petitioner Hughes Networks Systems, LLC and Hughes Communications, Inc. to provide my opinions as described below. For my efforts in connection with the preparation of this declaration I have been compensated at my standard rate of $590 per hour for this type of consulting activity. My compensation is in no way contingent on the results of these or any other proceedings relating to the above-captioned patent or matter.

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