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GOOGLE LLC, ZTE (USA), INC., SAMSUNG ELECTRONICS CO., LTD.,  
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HUAWEI DEVICE (DONGGUAN) CO. LTD.,  
HUAWEI INVESTMENT & HOLDING CO. LTD.,  
HUAWEI TECH. INVESTMENT CO. LTD., and  
HUAWEI DEVICE (HONG KONG) CO. LTD.,  
Petitioner

v.

CYWEE GROUP LTD.  
Patent Owner

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Case IPR2018-01257 (Patent No. 8,552,978)  
Case IPR2018-01258 (Patent No. 8,441,438)

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**EXPERT DECLARATION OF DR. JOSEPH LAVIOLA, PH.D., IN  
SUPPORT OF PATENT OWNER REPLY IN SUPPORT OF MOTION TO  
AMEND**

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## I. INTRODUCTION

1. I have been retained by Patent Owner CyWee Group Ltd. (“CyWee” or “Patent Owner”) as an expert in the area of motion sensors and sensor fusion technology. I make this Declaration at the request of CyWee regarding my opinions as an independent expert regarding the evidence cited by Petitioner Google LLC (“Google” or “Petitioner”) in its Opposition to the proposed amendments to claims 10 and 12 of U.S. Patent No. 8,552,978 and claims 1 and 3 of U.S. Patent No. 8,441,438 (the “438 Patent”), which are responsive to grounds raised in the matter of *Inter Partes* Reviews, Petitions IPR2018-01257 and IPR2018-01258.

2. I am being compensated for this work at the rate of \$400/hour, and my compensation is not dependent on the outcome of this matter.

3. In addition to the documents already listed in my previous reports, Exhibits 2004 and 2011, in preparation for this Declaration, I have studied Petitioner’s Oppositions to Patent Owner’s Motions to Amend, and Exhibits 1017-1018, and 2022, 2026, 2027, and 2031.

4. In addition to the above Papers and other documents, my opinions herein are also based upon my personal knowledge, professional judgment, education and

experience gained through my years as a computer scientist, professor, and consultant.

5. A detailed discussion of the '978 and '438 Patents, the level of ordinary skill in the art, the background of the relevant technology, the claim construction issues in the present IPR, and the prior art references relied on by Petitioner can be found in my Expert Declaration in Support of Patent Owner Response, provided as Exhibit 2004 in both IPR2018-01257 and IPR2018-01258.

6. My initial opinions on the proposed amended claims 19 and 20 (to replace claims 10 and 12) of the '978 and proposed amended claims 20 and 21 (to replace claims 1 and 3) of the '438 Patent can be found in my Expert Declaration in Support of Patent Owner's Motion to Amend, provided as Exhibit 2011 both IPR2018-01257 and IPR2018-01258.

## **II. QUALIFICATIONS, PUBLICATIONS, AND PRIOR TESTIMONY**

7. My Curriculum Vitae is provided as Exhibit 2005. A detailed listing of my qualifications, publications, and prior testimony can be found in my Expert Declaration in Support of Patent Owner Response. Ex. 2004, Section II.

## **III. THE ATTITUDE.CPP SOURCE CODE PRACTICES THE SENSOR FUSION AND ERROR MINIMIZATION METHOD OF THE '978 AND '438 PATENTS**

8. I have been provided with Exhibit 2031, Attitude.cpp, which I have been informed is the source code written for use with the JIL Phone. I have been informed that the inventions of the '438 and '978 Patents were conceived on May 22, 2009. I have also been informed that the JIL Phone running an earlier version of Attitude.cpp was able to practice the claims of the '438 Patent at least by the date CyWee informed Qualcomm it had a functioning prototype of the JIL Phone on July 29, 2009. I have further been informed that updates to the Attitude.cpp source code by September 25, 2009, enabled the JIL Phone to practice the claims of the '978 Patent. My review of Ex. 2031 supports the information with which I have been provided regarding the JIL Phone and earlier versions of the Attitude.cpp code.

9. I have thoroughly examined the Attitude.cpp code. It is my opinion that, given the hardware specifications of the JIL Phone, Ex. 2022, the JIL Phone, running the Attitude.cpp software, practiced all of the elements of at least claims 10 and 12 of the '978 Patent and at least claims 1 and 3-5 of the '438 Patent.<sup>1</sup> It is also my opinion that the source code running on the JIL Phone would have

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<sup>1</sup> The source code contained in Attitude.cpp also practices at least independent claims 14 and 19 of the '438 Patent; however, I have not provided a claim mapping for these claims because they are not at issue in the present IPRs.

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