

EXHIBIT 5

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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION**

Philips North America LLC,

Plaintiff,

v.

Garmin International, Inc.
and Garmin Ltd.,

Defendants.

Case No. 2:19-cv-06301-AB-KS

**EXPERT DISCLOSURE OF
THOMAS L. MARTIN**

June 22nd, 2020

1 1. I have been retained as an expert witness on behalf of Philips North America
2 LLC (“Philips”) for this matter. In particular, I have been asked to provide expert
3 opinions on testimony on technical matters and with regard to what one of ordinary skill
4 in the art would understand with respect to certain patents at issue in this case. These
5 opinions are set forth below, and I may provide testimony in response to any expert testimony
6 advanced by Garmin International, Inc. and/or Garmin Ltd. (collectively “Garmin”) as well.
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9 **I. BACKGROUND AND QUALIFICATIONS**

10 2. I am a Professor in the Department of Electrical and Computer Engineering
11 at Virginia Polytechnic Institute and State University, more commonly known as
12 “Virginia Tech” where I have been employed since 2001. I was previously an Assistant
13 Professor at the University of Alabama in Huntsville from 1999-2001. A current copy of
14 my curriculum vitae is attached as Exhibit 1.
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16 3. As discussed in my curriculum vitae, I have more than 25 years of
17 experience in the area of wearable technologies, with a particular emphasis on activity
18 monitoring technology. In 1992, I began working on wearable computers for campus tour
19 guides using the Global Positioning System (GPS) and aircraft maintenance. Since that
20 time, I have conducted research on a wide variety of wearable computing topics and
21 applications, including electronic textiles, ambulatory medical monitoring of
22 physiological data such as heart rate, activity classification based upon measuring a
23 person’s movements using sensors such as accelerometers and gyroscopes, and personal
24 protective equipment using GPS. I have also been affiliated with the International
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1 Symposium on Wearable Computers since 1998, having served as general chair,
2 technical program co-chair (3 times), technical program committee member, and steering
3 committee member.
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5 4. My education includes a Bachelor of Science degree in Electrical
6 Engineering in 1992 from the University of Cincinnati, a Master of Science degree in
7 Electrical and Computer Engineering in 1994 from Carnegie Mellon University, and a
8 Ph.D. in Electrical and Computer Engineering in 1999 from Carnegie Mellon University.
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10 5. My research areas include wearable computing (including for health and
11 activity monitoring), pervasive computing, interdisciplinary design teams for smart
12 devices, and electronic textiles (e-textiles). I am the co-director of the Virginia Tech E-
13 textiles Laboratory, which conducts research on hardware and software architectures for
14 e-textile applications, including both smart garments and large-scale fabrics such as home
15 furnishings. Since joining Virginia Tech, I have been the Principal Investigator or co-
16 Principal Investigator on over \$6.5M in external research funding. My current research is
17 focused on developing computational architectures and design tools for electronic textiles
18 that will allow domain experts to develop intelligent garments and home furnishings that
19 will work reliably across a range of populations, environments and applications. My goal
20 is to develop intelligent fabrics that look and feel like normal fabric, while providing
21 sensing and computing platforms that fit unobtrusively into a person's normal daily
22 routine. Reviews of my proposals stated that my research is "ground-breaking," "highly
23 innovative," "full of exciting potential," and "already showing a clear impact"; I was said
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1 to be “among a small group of pioneers” in electronic textiles. In 2006, I was one of 20
2 NSF researchers to receive the Presidential Early Career Award for Scientists and
3 Engineers (PECASE) for my research on electronic textiles for wearable computing.
4

5 6. One of my ongoing research thrusts is electronic textile garments for
6 monitoring a person’s motions using a variety of sensors attached to the clothing,
7 including accelerometers, gyroscopes, magnetometers, and bend sensors. Applications of
8 this research include sports medicine, treatment of motion-related injuries, physical
9 therapy for stroke victims, and monitoring patients’ physiological responses during
10 normal daily routines. I have recently completed a National Science Foundation Smart
11 Health and Wellbeing grant to develop e-textile garments for ambulatory medical
12 monitoring. These garments simultaneously monitor both the patient’s physiological
13 characteristics and movements, to annotate physiological data with information about the
14 patient’s activities, which are classified based upon measuring the movements of the
15 patient’s body segments (torso, arms, and legs) with wearable sensors. The goal is to
16 allow medical personnel to see the relationship of daily activities and physiological
17 response and to use the activities to determine when physiological data is collected,
18 providing a greater insight into the patient’s state of health and the dynamics of their
19 wellbeing. I am currently working with colleagues at the University of Minnesota and
20 University of Delaware on a National Science Foundation grant to develop soft
21 exoskeletons for children with mobility impairments of their arms; my portion of the
22 work is to monitor the movements of the arms using stitched stretch sensors and inertial
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