Pediatric Mobile Healthcare: Opportunities, Challenges, and Solutions

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ABSTRACT

Since its dawn, mobile healthcare (mHealth) has held promises of reducing hospitalization and administrative costs, making healthcare more accessible by enabling continuous and convenient patient monitoring, and increasing healthcare quality with instant emergency responses. While mHealth has gained significant attention and success over the last decade, pediatric mHealth remained disproportionately under explored. In this talk, I will begin by discussing several opportunities and challenges in pediatric mobile health care. I will then present some of our recent research results in this area.

In particular, I will introduce an in-ear wearable sensing system that can simultaneously monitor human's brain activities, eye movement, and facial movement using a single pair of in-ear electrodes comfortably placed inside human's ear canal. This in-ear sensing system could benefit a number of cyber-physical systems in health care including eating disorder monitoring, sleep disorder diagnosis, and neurological surgery practice [1]. I will also discuss sensing systems that allow us to unobtrusively monitor the physiological states and sleep quality of patients using radio [2] and optical [3] signals from afar. Lastly, I will present a pediatric health care platform that aims at realizing 24/7 outpatient clinical assistance through off-the-shelf mobiles and wearables.

We then take a broader look at the current and future challenges in moving pediatric mHealth results from research labs to practice.

References

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Biography

Professor Tam Vu is the director of Mobile and Networked Systems Lab at University of Colorado Denver. He is leading research efforts to design and develop mobile health care systems that help monitor and diagnose sleeping disorders, asthma, heart failure, and cognitive functions in children. Before that, he worked in various topics in core networking including inter domain routing, mobile-centric network architecture for future Internet, and end-host location privacy protection. His research outcomes are published in highly selective venues such as ACM SIGMOD, ACM MobiCom, ACM MobiSys, ACM Sensys, ACM CCS, IEEE Infocom, ACM UbiComp, Transaction on Mobile Computing(TMC) among other venues.

Tam Vu received his Ph.D. in Computer Science from WINLAB, Rutgers University in 2013 and B.S. from Hanoi University of Technology in 2006. He is the recipient of Creative Research Collaborative Fellowship at University of Colorado in 2015 and Google Faculty Research Award in 2014 for his work in Chrome browser authentication. He was also awarded three (03) Best Papers at ACM MobiCom conference and workshops (a flagship venue in mobile computing) for inventing new form of communication, called Capacitive Touch Communication (in ACM MobiCom 2012), for introducing a new technique to detect driver phone use while driving (in ACM MobiCom 2011), and for a novel system to sense breathing volume of patient during sleep using radio and optical signals (in ACM MobiCom S3 workshop 2016). His research also received wide press coverage including Denver Post, CNN TV, NY Times, The Wall Street Journal, National Public Radio (NPR), MIT Technology Review, Yahoo News, among other venues.

Acknowledgments

Part of this work has been funded by the U.S's National Science Foundation (NSF) through grants CNS-1619392 and CNS-1602428, Google Inc., Colorado Children Hospital, and Colorado's Office of Economics and Development and International Trade.

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SoICT '16 December 08-09, 2016, Ho Chi Minh City, Viet Nam

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DOI: <http://dx.doi.org/10.1145/3011077.3011082>