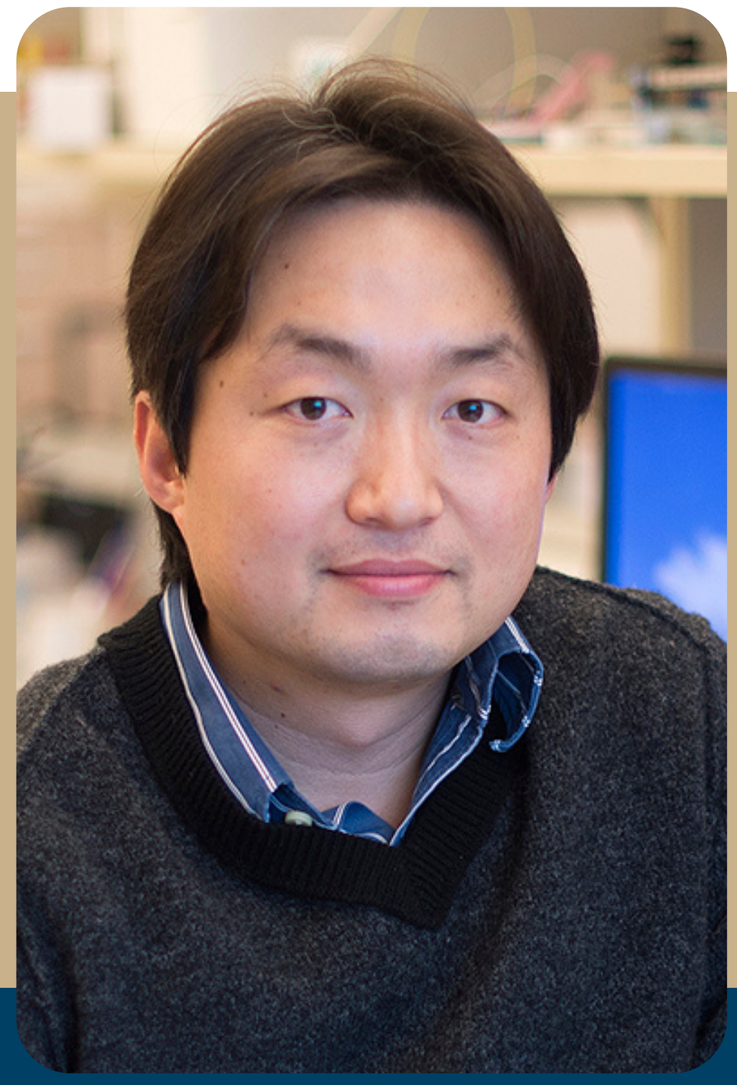
George Washington University
Department of Biomedical Engineering

BME SEMINAR

CLINICAL NEEDS-DRIVEN ENGINEERING IN WEARABLE HEALTHCARE



WITH PURDUE UNIVERSITY
ASSOCIATE PROFESSOR

DR. CHI HWAN LEE

WEDNESDAY, NOVEMBER 30TH, 11 AM
SEH B1270

Dr. Chi Hwan Lee is the Lesli A. Geddes Associate Professor of Biomedical Engineering and Associate Professor of Mechanical Engineering, and by Courtesy, of Materials Engineering at Purdue University. He also holds an adjunct professor in the School of Optometry at Indiana University. He received M.S. and Ph.D. degrees in Mechanical Engineering from Stanford University in 2009 and 2013, respectively. Prior to joining Purdue in 2015, he was a postdoctoral research associate in Department of Materials Science and Engineering at University of Illinois at Urbana-Champaign under the guidance of Prof. John A. Rogers. His scholarly efforts are dedicated to addressing unmet clinical needs using novel yet simple wearable devices with a clear path towards translation to produce measurable clinical and economic impacts. Since 2015 at Purdue University, he has teamed to secure a number of grants totaling > $30M from NSF, NIH, AFOSR, AFRL and Eli Lilly to support the thesis works of students. He has received prestigious national and international awards including the 2021 Sensors Young Investigator Award, 2020 Purdue CoE Early Career Research Award, 2019 NIH Trailblazer Award, and 2019 Korean-American Scientists and Engineers Association (KSEA) Young Investigator Award. He has published > 70 journal papers and 4 book chapters; issued 4 U.S. patents; filed 11 utility patents and > 15 provisional patents; and successfully launched 4 startup companies.

Dr. Lee's lab at Purdue University focuses on bridging a critical gap between engineering and unmet clinical needs through the innovation of wearable technologies. Our scholarly efforts are dedicated to addressing the gap using novel yet simple flexible micro-transducers with a clear path towards translation into measurable economic and societal impacts. We explore a variety type of wearable biomedical devices that are safely attachable to the skin or even eye, allowing for continuous remote assessment of human health and diseases. The pragmatic application of these devices is boundless ranging from healthcare to rehabilitation and to telemedicine. In this talk, I will introduce the following topics: (1) Sticker-like electronics (or StickTronics) that are flexibly attachable to curvilinear surfaces of arbitrary places, enabling a variety of pragmatic applications in human healthcare; (2) Wearable biomedical devices that are tailored for the human skin to address clinical needs of particular urgent concerns in the field of telemedicine; (3) Smart contact lenses that are built on various commercial brands of soft contact lenses for continuous remote assessment of ocular health and chronic diseases; and (4) Injectable silicon nanoneedles that are built on flexible and biodegradable patches for painless and long-term sustained ocular drug delivery. In each topic, I will also discuss about the results of detailed experimental and theoretical studies to uncover the essential attributes of functional materials, system-level integrations, and clinical implementations.