Tufts | School of Engineering

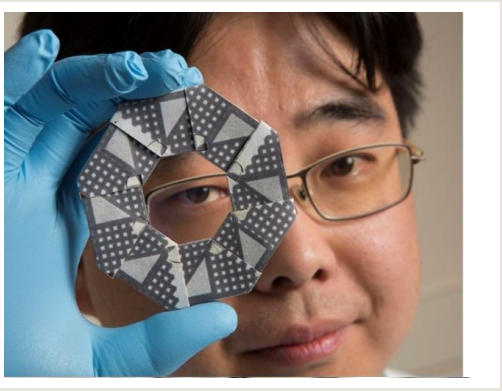
Department of Electrical and Computer Engineering

Seokheun "Sean" Choi, Ph.D.

Director
Bioelectronics & Microsystems Lab (BML)

Associate Director
Center for Research in Advanced Sensing Technologies

Associate Professor
Electrical & Computer Engineering
State University of New York, Binghamton



Seokheun "Sean" Choi is an Associate Professor in the Department of Electrical & Computer Engineering at State University of New York (SUNY)-Binghamton. Currently, he is running "Bioelectronics & Microsystems Lab" as a Director and "Center for Research in Advanced Sensing Technologies & Environmental Sustainability" as an Associate Director at SUNY-Binghamton. Prior to joining SUNY-Binghamton, he was a research professor in the School of Electronic & Computing Systems at the University of Cincinnati. He received his Ph.D. degree in bioelectronics from Arizona State University in 2011.

His current research focuses on next generation "Biosensing and Bioenergy technologies," including self-powered biosensors, wearable and stretchable sensors, biobatteries, papertronics, and fibertronics. He has been recognized as a pioneer in micro-sized biobatteries and paper-based biosensing systems. Over the years, he has secured funding over $2 million from NSF, ONR, Bill & Melinda Gates Foundation and SUNY Research Foundation. He has authored over 100 journal and conference articles, two book chapters, and one book, and hold two U.S. patents.

Microscale engineering to electromicrobiology

"Electromicrobiology" is an emerging field of study that investigates microbial electron exchange with external electrodes and microbial electrochemical functionalities. By incorporating microorganisms into a bioelectrochemical system (BES), the combined biotic-abiotic system generates renewable bioelectricity with organic waste while producing value-added chemicals/biofuels, offering a solution for environmental sustainability. BES technology can also perform many other functions, including desalinating water and detecting toxicity. By creating novel micro-BESs, his overall research and work has revolutionized knowledge about and applications for electromicrobiology.

Among the wide range of topics related to electromicrobiology, his work has addressed (I) paper-based bacteria-powered battery for on-chip biosensors, (II) biological solar cells for sustainable field applications, (III) bacteria-based biosensors for water quality monitoring, (IV) microscale engineering to electromicrobiology, and (V) microbial biosynthesis. These topics address grand challenges in energy and environmental sectors that are critical to the nation's security and competitiveness; enabling sustainable electronic applications that will augment human capabilities, and enhance societal wellbeing by providing ubiquitous environmental health monitoring.

Friday, February 15, 2019
Halligan Hall | 1:45pm - 2:45pm