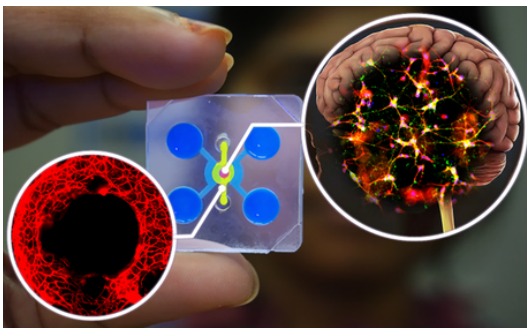


Bioelectronics and Bioinformatics Cluster — Department of Electrical and Computer Engineering

ABOUT

The world is experiencing a transformation where biology, electronics and data science converge to tackle critical challenges in healthcare, food safety and environmental sustainability. Bioelectronics enables direct interaction between living systems and devices, powering innovations like wearable sensors, bioenergy systems and living materials. Bioinformatics turns biological and environmental data into actionable insight, guiding intelligent system design with computational modeling and machine learning.

The Bioelectronics and Bioinformatics Cluster in the Department of Electrical and Computer Engineering integrates these fields to create adaptive systems that monitor health, track pathogens, detect pollutants and advance sustainability. Through interdisciplinary research, hands-on education and industry partnerships, we train the next generation of engineers to lead in this rapidly evolving frontier.



RESEARCH CENTERS

Center for Research in Advanced Sensing Technologies and Environmental Sustainability (CREATES)

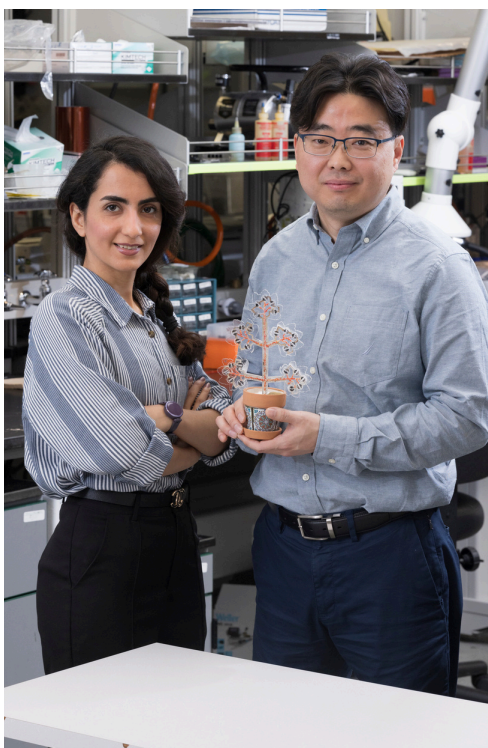
ws.binghamton.edu/creates/

BINGHAMTON UNIVERSITY

THOMAS J. WATSON
COLLEGE OF ENGINEERING
AND APPLIED SCIENCE

SPECIALITIES

- Bioelectronics and green electronics
- Biological microelectromechanical systems (BioMEMS)
- Lab-on-chips and organ-on-chips
- Biosensors
- Bioinformatics and AI-driven analytics
- Predictive physiological modeling
- Energy harvesting techniques



RELATED COURSES

- EECE 505 – BioMEMS and Bioelectronics
- EECE 516 – Introduction to Bioenergy
- EECE 605 – Interfacing Engineering & Biology at Nanoscale
- EECE 580L – Implantable Bioelectronic Devices
- EECE 434x/534x – Implementation of Human Organ-on-a-Chip
- EECE 501 – Analog Circuit Design
- EECE 580M – Low Power IoT Nodes Devices
- EECE 5800 – Sensors Applications & Technologies

POTENTIAL CAREER PATHWAYS

Biomedical and Healthcare Engineering

- Design and integrate electronic circuits, sensors, and embedded systems for medical devices as a biomedical engineer, medical device designer or R&D scientist

Biotech and Pharmaceuticals

- Apply signal processing, machine learning, and systems modeling to biological data as a bioinformatics Scientist, computational biologist or drug discovery engineer

Environmental and Sustainability Technology

- Develop electronic platforms for pollutant detection, microbial power generation, and resource monitoring as an environmental biosensor engineer or bioenergy specialist

Microelectronics and Smart Systems

- Engineer flexible, low-power and biointegrated circuits for next-generation wearables and IoT systems as a BioMEMS engineer, flexible electronics designer or device architect

AI and Data Science in Life Sciences

- Combine embedded sensing with AI algorithms to extract actionable biological insights as a machine learning engineer, biomedical data analyst or health informatics specialist

Academic and Government Research

- Advance bioelectronic science and technology as a professor, research scientist or program manager at universities, national laboratories or federal agencies (e.g., NIH, NSF, DOE, ONR)



FACULTY



Seokheun "Sean" Choi



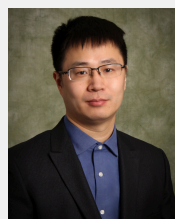
Jungwook "Jay" Paek



Anwar Elhadad



Ramesh Pokharel



Wenfeng Zhao



RESEARCH ACCOMPLISHMENTS AND ACTIVITIES

- Researchers boosted bacteria-powered biobattery performance using a 3D-printed stainless-steel micro-anode.
- Developed at Watson College, biodegradable "papertronics" use paper-based circuits with built-in components as a sustainable alternative to traditional electronics.

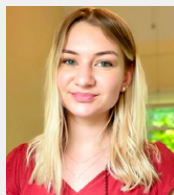


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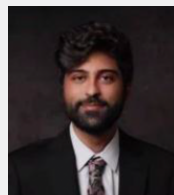
ALUMNI FROM BIOELECTRONICS AND BIOINFORMATICS CLUSTER



Maryam Rezaie, PhD '25
Engineer
Saras Micro Devices



Mya Landers, BS '21 MS '22
Electronics Hardware Designer
Draper



Amit Madan, BS '21 MS '21
Design Evaluation Engineer
Analog Devices



Mehdi Tahernia, PhD '20
Program Manager
Vital Materials Co., Limited



Maedeh Mohammadifar, PhD '20
Engineer
Bio-Rad Laboratories



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