SEOKHEUN "SEAN" CHOI, PH.D.

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Director of Bioelectronics and Microsystems Laboratory (Web: http://ws.binghamton.edu/choi),
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■ PROFESSIONAL EXPERIENCE

Associate Director, Center for Research in Advances sensing Technologies & Environmental Sustainability (CREATES), **SUNY Binghamton** *Feb. 2016 - Present*

Associate Professor, SUNY Binghamton *Sep. 2018 - Present*
Department of Electrical & Computer Engineering

Assistant Professor, SUNY Binghamton *Sep. 2012 - Aug.2018*
Department of Electrical & Computer Engineering

Research Assistant Professor, University of Cincinnati *Sep. 2011 - Aug.2012*
School of Electronic & Computing Systems (The Ohio Center for Microfluidic Innovation)

Research Engineer, LG Chem. Ltd. (Korea) *Dec. 2004 - Apr. 2006*
Battery Tech. Center, Research Park

■ EDUCATION

Ph.D. Electrical Engineering, **Arizona State University** *Aug. 2007 - Aug. 2011*
Ira A. Fulton School of Electrical, Computer & Energy Engineering
Dissertation: Advancing Microfluidic-Based Protein Biosensor Technology for Use in Clinical Diagnostics

M.S. Electrical Engineering, Sungkyunkwan University (Korea) *Mar. 2003 - Aug. 2004*
School of Information & Communication Engineering,
Thesis: Study on the ferroelectric domain using Piezoresponse Force Microscope

B.S. Electrical Engineering, **Sungkyunkwan University (Korea)** *Mar. 1996 - Feb. 2003*
School of Information & Communication Engineering *(Military service Apr. 1997 - Jun. 1999)*

■ AWARDS/GRANTS/FELLOWSHIPS/SCHOLARSHIPS

(a) External Funding (Total of $2.5M, of which ~ **$1.7M** to the Choi's Lab)

1. June 2019 ~ May 2022, **National Science Foundation –** (ECCS #1920979), $452,581 (**PI**); Power-on-Skin: Energy Generation from Sweat-Eating Bacteria for Self-Powered Electronic Skins (Portion for Choi: $271,549)

2. Jun 2018 ~ May 2021, **Office of Naval Research** (N00014-18-1-2422), ~$550,000 (**Sole PI**); Supercapacitive Micro-Bio-Photovoltaics for Sustainable Wireless Sensor Network

3. September 2017 ~ August 2020, **National Science Foundation** (ECCS # 1703394), $315,000 (**Sole PI**); Unlocking the Promise of Bacterial Electrogenicity

4. July 2016 ~ June 2019, **National Science Foundation** (BREAD IOS# 1543944), $867,536 (**co-PI**, **30%**); Development and Field Testing of paper-based Biosensors to Increase Productivity of Smallholder Agriculture in Developing Countries (Portion for Choi: $260,261)

5. July 2015 ~ June 2018, **National Science Foundation** (ECCS #1503462), $294,539 (**Sole PI**); An Origami Paper-Based Bacteria-Powered Battery for On-Chip Biosensors

(b) Internal Funding (~$300k in research funding since 2011)
-The 2019-2020 IEEC (Sole PI) - $25,000; High-Performance Paper PCBs
-The 2019-2020 Smart Energy Transdisciplinary Area of Excellence (PI) - $15,000; Gut Pathogens
-The 2018-2019 IEEC (Sole PI) - $50,000; Paper PCBs
-The 2018-2019 Smart Energy Transdisciplinary Area of Excellence (PI) - $15,000; Bio-solar cells
-The 2017-2018 Smart Energy Transdisciplinary Area of Excellence (PI) - $15,000; Biobatteries
-The 2015-2016 Health Sciences Transdisciplinary Area of Excellence (Co-PI) - $15,000; Biosensors
-The 2014-2015 Interdisciplinary Collaboration Grant (PI) - $15,000; Biological fuel cells
-ADL Small Grant (SUNY Binghamton) 2017 - $2500; Textile-based biobatteries
-ADL Small Grant (SUNY Binghamton) 2016 - $2500; A VOC sensor
-ADL Small Grant (SUNY Binghamton) 2015 - $2500; A paper-based biobattery
-ADL Small Grant (SUNY Binghamton) 2013 - $2500; A Micro-sized microbial fuel cell
-2015 Summer Scholars and Artist's Program Fellowship; $3000
-2014 Summer Scholars and Artist's Program Fellowship; $3000
-2013 Summer Scholars and Artist's Program Fellowship; $3000
-S3IP Undergraduate Research Initiative (Feb. 2016); $2000
-S3IP Undergraduate Research Initiative (Sep. 2014); $2000
-S3IP Undergraduate Research Initiative (Jan. 2013); $2000
-Senior Project 2016-2017; $5000 / 2015-2016; $4000 / 2014-2015; $5000/ 2013-2014; $3500
-Start-up funding (2012~2014) – $150,000

(c) Awards and Scholarship
- 2018 Career Champion from The Fleishman Center for Career and Professional Development at BU (2018)
- Breakthrough Innovation Award from The New York Academy of Science (2017)
- "Outstanding Reviewer Status" from Biosensors & Bioelectronics Journal (2016)
- NYS/UUP Individual Development Award (2016)

■ RESEARCH INTERESTS

BioMEMS, Biosensors, Microfluidics, Flexible Electronics (papertronics & fibertronics), Green Electronics, Point-of-care diagnostic devices, Micro-/Nano-technology for chemical/biological analysis and bioenergy harvesting, Micro-scale bioelectrochemical systems, Biosynthesis, and Soft robotics

■ RESEARCH ACCOMPLISHMENTS

- Choi invented paper-based microbial fuel cells and initiated the field of paper bioenergy (Energy harvesting).
  https://www.medicaldesignandoutsourcing.com/diagnostic-devices-developing-world/6/
  https://www.sciencedaily.com/releases/2016/12/161221110606.htm
  https://www.smithsonianmag.com/innovation/spit-powered-biobattery-made-single-sheet-paper-180961973/

- Choi created self-powered paper patches for non-invasive glucose monitoring (Biosensors).
  https://phys.org/news/2017-09-self-powered-paper-patch-diabetics-glucose.html

- Choi pioneered small-scale biophotovoltaic cells for internet of things (Energy harvesting & IoT).
  https://phys.org/news/2017-03-self-sustaining-bacteria-fueled-power-cell.html
  https://www.sciencedaily.com/releases/2016/04/160411152653.htm
  https://www.solarnovus.com/biological-solar-power-day-and-night_N8542.html

- Choi invented textile-based biobatteries for smart textiles (Flexible electronics & Energy harvesting).
  https://www.materialstoday.com/energy/news/stretchable-biobatteries-become-a-reality/
  https://www.sciencedaily.com/releases/2017/12/171207114948.htm
  https://www.technicaltextile.net/interviews/binghamton-university/lead-researcher/1742-1/

- Choi developed biodegradable biobatteries (Papertronics & Energy harvesting).
  https://www.sciencedaily.com/releases/2018/08/180808134159.htm
  https://theconversation.com/paper-based-electronics-could-fold-biodegrade-and-be-the-basis-for-the-next-generation-of-devices-102759

■ COURSES

EECE 605 (Fall) – Interfacing Engineering and Biology at Nanoscale (*Developed by Dr. Choi*)
This course covers aspects of bio-molecular function and the interface with synthetic nanomaterials to explore the possibility of devices and systems that are unprecedented in nature. Students will learn the principles of design of biological nanosystems, will be able to critically respond to the engineering issues surrounding the creation of nano-sensors/nano-robots/nano-devices, and will be able to appreciate their potential benefit and impact in health, agricultural, industrial and human environments. This course includes both lectures and hands-on laboratory components.

EECE 516 (Spring) – Introduction to Bioenergy (*Developed by Dr. Choi*)
This course is an undergraduate senior (4+1 program)/Graduate level course. This course is meant to provide an overview of the field of renewable energy/fuel made available from biologically derived materials with focus on its system implementations. In particular, the course will focus on innovative microsystems for bioelectricity, biofuel, biorefinery, and environmental applications. This course includes both lectures and hands-on laboratory components.

EECE 505 (Fall) – BioMEMS and Bioelectronics (*Developed by Dr. Choi*)
This course is an undergraduate senior (4+1 program)/Graduate level course. This course is meant to provide an overview of the field of bioMEMS, Biosensors and bioelectronics. It will familiarize students with micro/nanofabrication techniques, Lab-on-a-chip, microfluidics, various microfluidic components, biofuel cells, drug delivery, neural interface, and microsystems for cellular studies and tissue engineering. This course includes both lectures and hands-on laboratory components.

EECE 332 (Fall) – Semiconductor devices
This course is an undergraduate junior/senior level core course for EE (Electrical Engineering) students. This course covers basic theory of semiconductors, p-n junctions, bipolar junction transistors, and MOS field effect devices

EECE 323 (Spring) – Electromagnetics
This course is an undergraduate junior/senior level core course for EE (Electrical Engineering) students. This course covers fundamentals of electromagnetic fields, Maxwell's equations, plane waves & reflections and application to transmission lines, antennas, propagation, electromagnetic interference, electronics packaging & wireless communication

EECE 497/499/597/697 – Independent Study
These courses are designed to allow students to work individually with a faculty member on a project or topic of mutual interest.

EECE 489 – Senior Project
Design projects in cooperation with local industry, other external clients, and university sponsored projects - outlining specifications, proposals, time schedules, and paper designs. Periodic design reviews with client, written and oral progress reports, final presentation. Evaluation based on individual and team performance.

■ PROFESSIONAL/UNIVERSITY SERVICES

Proposal Reviewer
-Swiss National Science Foundation – Proposal review (July 2018)
-NSF Review Panels (Nov. 2011, Feb. 2013, Mar. 2017, Feb. 2018, Aug. 2018)
-Mitacs Globalink Partnership Award – Proposal review (Oct. 2017 & May 2018)
-European Research Council Executive Agency - Proposal review (Sep. 2017)
-Israel Ministry of Science, Technology and Space - Proposal review (Apr. 2017)
-National Science Centre, Poland (2016)
-French National Research Agency – Proposal review (2015)
-India Alliance Fellowship application reviewer (2013)

Journal Referee (73 Journals) *Sep. 2009 - Present*
ACS Applied Materials & Interfaces; ACS Industrial & Engineering Chemistry Research; ACS Sensors; ACS Sustainable Chemistry & Engineering; Acta Biomaterialia; Advances in Bioscience and Bioengineering; ***Advanced Materials****;* ***Advanced Energy Materials****;* ***Advanced Functional Materials****; Advanced Intelligent Systems; Advanced Sustainable Systems; Analytical Chemistry; Applied Surface Science; Batteries; Bioresource Technology; Biochemistry and Biotechnology Research; Bioelectrochemistry; Biosensors and Bioelectronics; Biotechnology Progress; Chemical Engineering Journal; ChemElectroChem; ChemCom; Colloids and Surfaces B: Biointerfaces; Desalination and Water Treatment; Electroanalysis; Electrochemistry Communication; Energies (MDPI); Energy*

(Elsevier); Energy & Fuels; Environmental Science & Technology letters; Enzyme and Microbial Technology; Fuel Cells; Fermentation; Frontiers of Energy; Frontiers of Optoelectronics; IEEE Sensors; IEEE Transactions on Biomedical Engineering; International Journal of hydrogen energy; International Journal of Environmental Analytical Chemistry; Journal of the Association for Laboratory Automation; Journal of Biotechnology; Journal of Chemical Technology and Biotechnology; Journal of Hazardous Materials; Journal of Industrial & Engineering Chemistry; Journal of Materials Chemistry A; Journal of Microbial Biochemical Technology; Journal of Microelectromechanical Systems; Journal of the Electrochemical Society; Journal of Power Sources; Lab on a Chip; Materials Research Bulletin; ***Materials Today****; Micro and Nano Letter; Micro and Nano Systems Letters; Microelectronic Engineering; Microfluidics and Nanofluidics; Micromachines; Microsystem Technologies; Molecules;* ***Nano Energy****; Nanoscale; NPJ Flexible Electronics;* ***Nature Sustainability****; Physical Chemistry Chemical Physics; Open Journal of Applied Biosensor; PLOS ONE; RSC Advances; Science of the Total Environment; Sensors; Sensors & Actuators: A. Physical; Sensors & Actuators: B. Chemical; Smart Grid & Renewable Energy; Surface & Coating Technology; Technology; Waste Management*

Journal Editorial Board

-Editorial Board Member in Robotics (MDPI) *Feb. 2019 - Present*
-Guest Editor for special issue "Biosensing Systems for POC Diagnostics" in Sensors *Nov. 2018 – Dec. 2019*
-Guest Editor for special issue "Microbial Fuel Cells" in Batteries *Nov. 2018 – Dec. 2019*
-Editorial Board Member in Sensors (MDPI) *Nov. 2018 - Present*
-Associate Editor in Frontiers in Bioengineering & Biotechnology *Aug. 2017 - Present*
-Guest Editor for special issue "Bio-batteries" in Batteries *May 2017 – Aug. 2018*
-Guest Editor for special issue "Micro-/nano-systems for bioengineering and biotechnology," in Frontiers in Bioengineering & Biotechnology *Dec.2016 – Jan.2018*
-Editorial Board Member in Batteries (MDPI) *Feb. 2016 - Present*
-Editorial Board Member in Open Journal of Applied Biosensor *Aug. 2012 - Present*
-Editorial Board Member in Smart Grid & Renewable Energy *Jan. 2013 - Present*
-Editorial Board Member in Biosensors Journal *Dec. 2013 - Present*
-Editorial Board Member in Advances in Bioscience and Bioengineering *Oct. 2013 – Dec. 2014*
-Editorial Board Member in Journal of Biochips & Tissue Chips *Dec. 2013 – Dec. 2014*

Scientific Committee

- IEEE Sensors 2019 conference – Paper Reviewer
- IEEE Engineering in Medicine and Biology Society 2019 – Paper Reviewer
- IEEE Engineering in Medicine and Biology Society 2018 – BioMEMS and Microfluidics Session co-chair
- 2018 IEEE Biomedical Circuits and Systems Conference – Paper Reviewer
- IEEE Sensors 2018 conference – Paper Reviewer
- IEEE Sensors 2017 conference – Paper Reviewer
-18th International Conference on Solid-State Sensors, Actuators and Microsystems 2015 (Transducers) – Session co-chair (Electro Fluidics)
-IEEE NEMS 2014 – Session Chair (Micro/Nano Robotics, Assembly and Automation)
-IEEE International Symposium on Mechatronics and Applications (ISMA 2013) – Technical Program Committee

Member

- IEEE Senior Member
- ASME Member
- International Society for Microbial Electrochemistry and Technology
- Korean-American Scientists and Engineering Asscociation

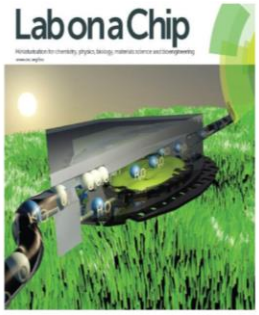
University Services

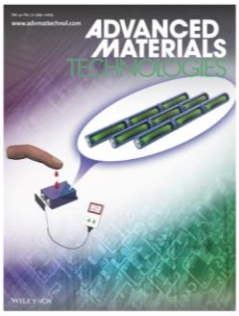
- Faculty Senate *Sep. 1, 2018 - Aug. 31, 2020*
- Watson School Committees *Sep. 1, 2018 - Aug. 31, 2019*
(Communications & Marketing – Chair; Strategic Plans Development for 2020-2021)
- Mentor (ECE Tenure-Track Faculty Mentoring Program) *Sep. 1, 2018 - Present*
- Faculty Search Committee; Power Electronics (2017 Fall)
- Faculty Search Committee; Power Electronics (2016 Fall)
- Watson School Committees (Library) *Sep. 1, 2014 – Aug. 31, 2016*
- EECE Lab space Committee (2015)
- Faculty Advisor for SUNY Chapter of Society Asian Scientists and Engineers (SASE) *Sep. 1, 2012 - Present*

- Serving as an associate director for Center for Research in Advances sensing Technologies & Environmental Sustainability (CREATES) *Feb. 1, 2016 - Present*
- Faculty Member for Center for Autonomous Solar Power (CASP)
- Faculty Member for Biofilm Research Center (BBRC)

Synergistic Activities
-Supervised 1 student from NIRMA University in India through Summer 2019 Internship at BU.
-Co-organized "Science-to-Technology Day (S^2T)" on Nov. 18, 2016. Keynote: Dr. Diane Okamuro (NSF).
-Offered Summer High School Research Program in 2015, 2016, & 2017 – supervised 1 student every year.
-Supervised 1 undergraduate student (African-American Female) through 2017 LSAMP Summer Research Program.
-Supervised 1 student from Broome Community College through 2017 NSF Research Experiences for Undergraduates (REU) program for Renewable Energy Generation and Storage (NSF#1658990).
-Supervised 1 student from Queensborough Community College through 2015 NSF REU program for Renewable Energy Generation and Storage (NSF#1263004).
-Supervised 1 student (African-American Female) from Russel Sage College through 2014 NSF REU program for Renewable Energy Generation and Storage (NSF#1263004).
-Supervised 1 undergraduate student through 2014 McNair Summer Research Program.
-Offered Spring Undergraduate Bioenergy Research Program in 2017– 4 undergraduate students.
-Offered Spring Undergraduate Bioenergy Research Program in 2016– 5 undergraduate students.
-Offered Spring Undergraduate Bioenergy Research Program in 2015– 7 undergraduate students.
-Offered Spring Undergraduate Bioenergy Research Program in 2014– 6 undergraduate students.
-Offered Summer Undergraduate Bioenergy Research Program in 2013– 3 undergraduate students.
-Offered Winter Undergraduate Bioenergy Research Program in 2012– 9 undergraduate students.

■ PUBLICATIONS (>100 refereed publications, H-index: 26)





REFEREED JOURNAL ARTICLES:

2019

1. L. Liu, and **S. Choi**, "A Self-Charging Cyanobacterial Supercapacitor" ***Biosensors and Bioelectronics***, 140, 11354, 2019 (**IF 9.5**)
2. M. Mohammadifar, and **S. Choi**, "A Solid Phase Bacteria-Powered Biobattery for Low-Power, Low-Cost, Internet of Disposable Things" ***Journal of Power Sources***, 429, pp. 105-110, 2019 (**IF 7.5**) - *This work was reported by ScienceDaily, Newswise, Techexplore, Siliconrepublic, etc.*
3. M. Mohammadifar, M. Tahernia, and **S. Choi**, "An Equipment-free, Paper-based Electrochemical Sensor for Visual Monitoring of Glucose Levels in Urine" ***SLAS Technology***, In-Print (Invited) (**IF 2.6**)
4. Y. Gao, M. Mohammadifar, and **S. Choi**, "From microbial fuel cells to Biobatteries: Moving toward on-demand micro-power generation for Small-scale Single-Use Applications," Progress Report (Invited), ***Advanced Materials Technologies*** (A new sister journal of Advanced Materials), 4, 1970039, 2019 (**IF 5.4**) (***Featured on the Inside Back Cover)***
5. K.K. Lee, M. Kim, and **S. Choi**, "A whole blood sample-to-answer polymer lab-on-a-chip with superhydrophilic surface toward point-of-care technology," ***Journal of Pharmaceutical and Biomedical Analysis***, 162, pp.28-33, 2019 (**IF 3.0**)

2018

6. M. Mohammadifar, I. Yazgan, J. Zhang, V. Kariuki, O. Sadik, and **S. Choi**, "Green Biobatteries: Hybrid Paper-Polymer Microbial Fuel Cells," ***Advanced Sustainable Systems***, (A new sister journal of Advanced Materials), 2 1800041, 2018. *This work was reported by ScienceDaily, newswise, nanowork, Techxplore, ErekAlert, etc.*

7. Y. Gao and **S. Choi**, "Merging Electric Bacteria with Paper," ***Advanced Materials Technologies*** (A new sister journal of Advanced Materials), 3, 1800118, 2018. (**IF 5.4**)
8. M. Mohammadifar and **S. Choi**, "On-demand Micro-power Generation from an Origami-inspired Paper Biobattery Stack," ***Batteries*** (MDPI), 4, 14, **2018**
9. I. Yazgan, J. Zhang, V. Kariuki, A. Akgul, L.E. Cronmiller, A. Akgul, F. Osonga, A. McMahon, Y. Gao, G. Eshun, **S. Choi**, and O. Sadik, "Selective sensing and Imaging of Penicillium italicum spores and hyphae using carbohydrate-lectin interactions," ***ACS Sensors***, 3, 648-654, **2018** (**IF 6.9**)
10. M. Mohammadifar, J. Zhang, I. Yazgan, O. Sadik and **S. Choi**, "Power-on-paper: Origami-inspired Fabrication of 3-D Microbial Fuel Cells," ***Renewable Energy***, 118, 695-700, **2018** (**IF 5.4**)
11. S. Pang, Y. Gao, and **S. Choi**, "Flexible and Stretchable Microbial Fuel Cells with Modified Conductive and Hydrophilic Textile," ***Biosensors and Bioelectronics***, 100, 504-511, **2018** (**IF 9.5**)
12. S. Pang, Y. Gao, and **S. Choi**, "Flexible and Stretchable Biobatteries: Monolithic Integration of Membrane-free Microbial Fuel Cells in a Single Textile Layer," ***Advanced Energy Materials***, 8, 1702261, **2018** (**IF 24.8**) - *This work was reported by ScienceDaily, Newswise, Techxplore, ErekAlert, etc.*

2017

13. L. Liu and **S. Choi**, "Self-sustainable, High-power-density Bio-solar Cells for Lab-on-a-chip Applications," ***Lab Chip***, 17, 3817-3825, 2017 (**IF 6.045**) - *This work was reported by Phys.ORG, ScienceDaily, Energy Harvesting Journal, Newswise, SolarDaily, ErekAlert, etc.*
14. E. Cho, M. Mohammadifar, and **S. Choi**, "A Single-use, Self-powered, Paper-based Sensor Patch for Detection of Exercise-induced Hypoglycemia," ***Micromachines***, VIP Feature Article (Invited), 8, 265, **2017** (**IF 2.2**) (***Featured on the Cover of Micromachines***) - *This work was reported by Phys.ORG, ScienceDaily, WAREABLE, Biospace, Crazyengineers, EurekAlert, etc. This work has been selected as the best paper in 2018.*
15. Y. Gao, D. Hassett and **S. Choi**, "Rapid characterization of bacterial electrogenicity using a single-sheet paper-based electrofluidic array," ***Frontiers in Bioengineering and Biotechnology***, 5, 44, **2017** (**IF 5.1**)
16. M. Mohammadifar and **S. Choi**, "A Papertronics, On-demand and Disposable Biobattery: Saliva-activated Electricity Generation from Lyophilized Exoelectrogens pre-inoculated on Paper," ***Advanced Materials Technologies*** (*A new sister journal of Advanced Materials*), 2, 1700127, **2017** (**IF 4.6**)- *This work was reported by New York State's Empire State Department, Smithsonian, Fox news, ScienceDaily, IFLScience, Popular Mechanics, Newswise, Electronics360, etc.*
17. L. Liu and **S. Choi**, "Self-sustaining, solar-driven bioelectricity generation in micro-sized microbial fuel cell using co-culture of heterotrophic and photosynthetic bacteria," ***Journal of Power Sources***, 348, 138-144, **2017** (**IF 6.9**) - *This work was reported by ScienceDaily, Sciencenewline, Phys.org, Electronicproducts, healthmedicinet, and azocleantech.*
18. W. Yang, K. Lee, and **S. Choi**, "A Laminar-flow based Microbial Fuel Cell Array," ***Sensors & Actuators: B. Chemical***, 243, 292-297, **2017.** (**IF 5.7**)
19. Y. Gao and **S. Choi**, "Stepping Towards Self-powered Papertronics: Integrating Biobatteries into a Single Sheet of Paper," ***Advanced Materials Technologies*** (*A new sister journal of Advanced Materials*), 2, 1600194, **2017** (**IF 4.6**) - *This work was reported by ScienceDaily, Sciencenewline, Newswise, Esciencenews, steemit, EurekAlert, HitechDays and Smithsonian.*

2016

20. W. Yang, W. Xuejian, and **S. Choi**, "A Dual-channel, Interface-free, Bacteria-based Biosensor for Highly-Sensitive Water Quality Monitoring," ***IEEE Sensors***, 16, 8672-8677, **2016** (**IF 1.889**)
21. A. Fraiwan, H. Lee, and **S. Choi**, "A Paper-based Cantilever Array Sensor: Monitoring Volatile Organic Compounds with Naked Eye," ***Talanta***, 158, 57-62, **2016** (**IF 4.035**)
22. A. Fraiwan, L. Kwan, and **S. Choi**, "A Disposable Power Source in Resource-limited Environments: A Paper-based Biobattery Generating Electricity from Wastewater," ***Biosensors and Bioelectronics***, 85, 190-197, **2016** (**IF 7.476**) - *This work was reported by NSF Science360 News, Discover-e, ScienceDaily, SpaceDaily, Science Newsline, Innovation Toronto, Materialsgate, Arts Insiders, and e! Science News.*
23. A. Fraiwan, and **S. Choi**, "A stackable, Two-chambered, Paper-based Microbial Fuel Cell," ***Biosensors and Bioelectronics***, 83, 27-32, **2016** (**IF 7.476**)
24. X. Wei, H. Lee, and **S. Choi**, "Biopower generation in a microfluidic bio-solar panel," ***Sensors & Actuators: B. Chemical***, 228, pp.151-155, **2016** (**IF 4.758**) - *This work was reported by Science Daily, Siliconrepublic.com, ZME science, ECN Magazine, NDTV.com, Azo Cleantech, CIOL, The Stack, Crazy Engineers, The Engineer, Business Standard, Silicon India, Energy Matters, News Nation, Before it's News, New Energy and Fuel, Nature World News, Solar Energy News, and e! Science News.*
25. C. Fischer, A. Fraiwan, and **S. Choi**, "A 3D paper-based enzymatic fuel cell for self-powered, low-cost glucose monitoring," ***Biosensors and Bioelectronics***, 79, pp.193-197, **2016** (**IF 7.476**)

26. W. Yang, X. Wei, A. Fraiwan, C.G. Coogan, H. Lee, and **S. Choi**, "Fast and Sensitive Water Quality Assessment: A uL-scale Microbial Fuel Cell-based biosensor Integrated with an air-bubble trap and electrochemical sensing functionality," ***Sensors & Actuators: B. Chemical***, 226, pp.191-195, **2016** (**IF 4.758**)
27. G. Choi and **S. Choi**, "Cellular Flow in Paper-based Microfluidics," ***Sensors & Actuators: B. Chemical***, 237, pp. 1021-1026, **2016** (**IF 4.758**)
28. **S. Choi**, "Powering point-of-care diagnostic devices," ***Biotechnology Advances***, Review Article, 34, pp. 321-330**,** **2016** (**IF 10.597**)

2015

29. G. Choi, and **S. Choi**, "Monitoring electron and proton diffusion flux through three-dimensional, paper-based, variable biofilm and liquid media layers," ***Analyst***, 140, pp. 5901-5907**,** **2015** (**IF 4.107**)
30. H. Lee, and **S. Choi**, "An origami paper-based bacteria-powered battery," ***Nano Energy***, 15, pp. 549-557, **2015** (**IF 10.211**) *–This work was reported by Time Warner Cable News, Newsweek Europe, Electronics Weekly (UK), Dutch Magazine KIJK, BBC Focus Magazine, TreeHugger, ScienceDaily, IEEE Spectrum, Lab Maganer Magazine, Health News Digest, Digital Trend, and Discover-e Newsletter at Binghamton University.*
31. G. Choi, and **S. Choi**, "A paper-based microbial fuel cell array for rapid and high-throughput screening of electricity-producing bacteria," ***Analyst***, 140, pp. 4277-4283, **2015** (**IF 4.107**)
32. **S. Choi**, "Microscale microbial fuel cells: advances and challenges," ***Biosensors and Bioelectronics***, Review Article, 69, pp. 8-25, **2015** (**IF 6.451**)
33. H. Lee, and **S. Choi**, "A micro-sized biosolar cell for self-sustaining power generation," ***Lab on a Chip***, 15, pp. 391-398, **2015** (**IF 6.115**) (***Featured on the Cover of Lab Chip, Lab on a Chip 2015 HOT article***) *–This work was reported by Materials 360 (MRS's online publication), Solar Novus Today, Pipe Dream News and Discover-e Newsletter at Binghamton University.*

2014

34. A. Fraiwan, and **S. Choi**, "Bacteria-Powered Battery on Paper," ***Physical Chemistry Chemical Physics*** 16, pp.26288-26293**,** **2014** (**IF 4.198**)
35. A. Fraiwan, S.P. Adusumilli, D. Han, A.J. Steckl, D.F. Call, C.R. Westgate, and **S. Choi**, "Microbial Power-generation Capabilities on Micro-/Nano-structured Anodes in Micro-sized Microbial Fuel Cells," ***Fuel Cells***, 14, pp. 801-809, **2014** (**IF 1.546**)
36. A. Fraiwan, Hankeun Lee and **S. Choi,** "A multi-Anode paper-based microbial fuel cell: A potential power source for disposable biosensors," ***IEEE Sensors Journal***, Vol. 14, pp.3385-3390, **2014** (**IF 1.852**)
37. A. Fraiwan, D.F. Call and **S. Choi**, "Bacterial growth and respiration in laminar flow microbial fuel cell," ***Journal of Renewable and Sustainable Energy***, Vol. 6, pp.023125, **2014** (**IF 1.51**)
38. S. Yoon, H. Lee, A. Fraiwan, C. Dai and **S. Choi**, "A microsized microbial solar cell: A demonstration of photosynthetic bacterial electrogenic capabilities," ***IEEE Nanotechnology Magazine***, Vol. 8, pp.24-29, **2014**
39. T.H. Nguyen, A. Fraiwan and **S. Choi**, "Paper-based batteries: A Review," ***Biosensors and Bioelectronics***, Vol. 54, pp.640-649, **2014** (**IF 6.451**) (***Top 25 the most Downloaded Articles from ScienceDirect as of Dec. 2014***)**.**

2013

40. A. Fraiwan, S. Mukherjee, S. Sundermier, H. Lee and **S. Choi** "A paper-based microbial fuel cell: Instant battery for disposable diagnostic devices," ***Biosensors and Bioelectronics,*** Vol.49, pp.410-414, **2013** (**IF 6.451**)
41. A. Fraiwan, S. Sundermier, D. Han, A. Steckl, D.J. Hassett and **S. Choi**, "Enhanced Performance of MEMS Microbial Fuel Cells using Electrospun microfibrous anode and optimizing operation," ***Fuel Cells***, Vol.13, pp.336-341, **2013 (IF 1.546)**
42. Simeng Chen, Yuchao Wang and **S. Choi**, "Applications and Technology of Electronic nose for Clinical Diagnosis," ***Journal of Applied Biosensor***, Review Article, Vol.2, pp.39-50, **2013**.
43. Chunhui Dai and **S. Choi**, "Technology and Applications of Microbial biosensor," ***Journal of Applied Biosensor***, Review Article, Vol. 2, pp. 83-93, **2013**.
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2. Y. Gao, L. Liu, and **S. Choi** "Flexible and scalable biochemical energy harvesting: a yarn-based biobattery," ***IEEE International Conference on Micro-Electro-Mechanical-Systems (MEMS)***, Jan. 27 - 31, 2019, Seoul, Korea, in-print

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1. Y. Gao, L. S. Thomas, M. R. Oefelein, L. C. Cook and **S. Choi**, "Electrogenic Capabilities of Gut Bacteria," ***American Society for Microbiology (ASM) Microbe 2019***, June 20~24, 2019, San Francisco, CA, USA.
2. M. Mohammadifar, M. Tahernia, and S. Choi, "Electricity Generation from Sweat-Eating Bacteria," ***American Society for Microbiology (ASM) Microbe 2019***, June 20~24, 2019, San Francisco, CA, USA.
3. M. Tahernia, M. Mohammadifar, **S. Choi**, "A 3-D multilayer paper printed circuit board," ***The 30th Annual Electronics Packaging Symposium***, Sep. 18~19, 2018, Binghamton, NY, USA.
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5. Y. Gao and **S. Choi**, "A disposable microbial battery pack for point-of-care testing in resource-limited settings" ***IEEE-NIH 2017***, Nov. 6-8, 2017, Bethesda, MD, USA.
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12. S. Sundermier, A. Fraiwan and **S. Choi**, "Laminar Flow based microbial fuel cells," Advances in Microfluidics & Nanofluidics, May 24-26, South Bend, Indiana, USA, 2013

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1. **S. Choi,** "Advancing Microfluidic-Based Protein Biosensor Technology for Use in Clinical Diagnostics," *LAP LAMBERT Academic Publishing GmbH & Co. KG,* (ISBN 978-3-8465-5504-0), **2012**

Book Chapters:

1. **S. Choi,** & J. Chae, "A surface plasmon resonance biosensor based on competitive protein adsorption for the prognosis of thyroid cancer" in "Biosensors and Molecular Technologies for Cancer Diagnostics" Avi Rasooly (Program Director, Cancer Diagnosis Program, National Cancer Institute) and Keith E. Herold, ***CRC Press (Taylor & Francis Group)***

2. **S. Choi,** & J. Chae, "Microfluidic biosensors for thyroglobulin detection and application to thyroid cancer" in "Biosensors and Cancer" Professor Victor R Preedy (PhD DSc FRSPH FIBiol FRCPath, King's College London), ***SCIENCE PUBLISHERS***

Patent:

1. J. Chae & S. Choi, "REUSABLE BIOSENSOR PLATFORM," - WO 2010088219

2. J. Chae, B.E. Rittmann, S. Choi, H. Lee, "Micro-sized Microbial fuel cell," US 13153110

■ INVITED TALKS

1. Invited to give talks at **2020 MRS Spring** (Apr. 13-17) in Arizona (Symposium SM05 – Engineering Functional Multicellular Circuits, Devices, and Systems)
2. Invited to give talks at **2020 TMS Annual Meeting** (Feb. 23-27) in San Diego, USA (Functional Nanomaterials 2020: Translating Innovative into Pioneering Technologies)
3. Invited to give a ***Keynote talk*** on Biobatteries at 12th International Conference & Exhibition on Biosensors and Bioelectronics (Oct. 25~26, 2019 at Vancouver, Canada)
4. Invited to **Science Foo Camp 2019** (July 12-14 in Mountain View, CA; Organized by Google, O'Reilly Media, and Digital Science) – Only 350 people are invited from around the world who are doing groundbreaking work in diverse areas of science and technology.
5. Invited to give talks at **2019 MRS Spring** (Apr. 22-26) in Arizona (Symposium EP05 - Engineering Functional Multicellular Circuits, Devices and Systems). (Title: Microorganisms to Generate Electricity)
6. Invited to give a talk at **Johns Hopkins University** (Extreme Materials Institute), Mar. 15th, 2019. (Title: Microscale Engineering to Electromicrobiology)
7. Invited to give a talk at **Stevens Institute of Technology** (ECE Department), Mar. 11th, 2019. (Title: Microscale Engineering to Electromicrobiology)
8. Invited to give a talk at **Tufts University** (ECE Department), Feb. 15th, 2019. (Title: Microscale Engineering to Electromicrobiology)
9. Invited to give a talk at **Princeton University** (Plasma Physics Laboratory), Jan. 16th, 2019. (Title: Microscale Engineering to Electromicrobiology)
10. Invited to give a talk at the **University of Rochester** (Department of Anesthesiology Grand Rounds), Dec. 20th, 2018. (Title: Micro- & Nano-medical Technologies and Applications)
11. Invited to give a talk at **IEEE NANOMED 2018**, Dec. 2-5, Hawaii, USA (Title: Powering point-of-care diagnostic devices with Disposable Biobatteries)
12. Invited to give a talk at **ACS Boston Symposium** 2018, Aug. 19-23, Boston, USA (Title: Merging Electronic Bacteria with Paper)
13. Invited to give a talk at **2018 MRS Spring**, Apr. 2-6, Phoenix, USA (Title: On-Demand Power Generation from Lyophilized Exoelectrogens)
14. Invited as a guest speaker for an interesting research seminar at the **University of New Hampshire** (Dept. of ECE), Nov. 17th, 2017.
15. Invited as a speaker for the Second Annual Summit on Science Enablement for the Sustainable Development Goals (sponsored by the **New York Academy of Sciences**), October 17th, 2017, New York, USA.
16. Invited as a speaker for the **18th US-KOREA Conference** on Science, Technology and Entrepreneurship (UKC), August 9-12, 2017, Washington DC, USA
17. Invited as a panelist for the **NSF Workshop on Papertronics**: Paper-based Electronics for the 21st Century, Sep. 12-14, 2016, Arlington, VA, USA
18. Invited as a panelist for SUNY 4E Workshop on Energy & Sustainability, Nov. 20-21, Binghamton, NY, USA, 2014
19. Invited as a speaker for the Center for Advanced Sensors and Environmental Systems (CASE) workshop, Mar. 22, 2013, Binghamton University, Binghamton, USA.
20. Invited as a speaker for the IEEC TAB meeting, Oct. 2, 2012, Binghamton University, Binghamton, USA.

■ GROUP HIGHLIGHTS (Media outlets)

1. Many news agencies highlighted our work on solid-phase biobatteries for IoT. The media outlets include Materials today, Sciencedaily, Techxplore, NEWSWISE, and many others. *June. 2019*
2. Many news agencies highlighted our new research award from National Science Foundation for energy generation from human sweat. The media outlets include NEWSWISE, EurekAlert, SCIENMAG, The Engineer, and many others. *May, 2019*.
3. The work on "Paper biobatteries" has been highlighted in THE CONVERSATION. *Sep., 2018.*
4. Choi's presentation at the ACS conference was highlighted in many news agencies including Chemical & Engineering News, ScienceDaily, IEEE Spectrum, etc. Aug. 2018.
5. Many news agencies highlighted our new research award from the Office of Naval Research for the micro-bio-photovoltaics project. The media outlets include EurekAlert, Phys.ORG, Scienmag, NEWSWISE, and many others. *May, 2018*
6. Many news agencies highlighted our work on textile biobatteries. The media outlets include Materials today, Sciencedaily, Techxplore, NEWSWISE, and many others. *Jan.. 2018*
7. Many news agencies highlighted our work on the glucose sensor. The media outlets include Phys.ORG, Sciencedaily, Wareable, Biospace, and many others. *Sep. 2017*
8. Our saliva-based biobattery has been selected as one of 7 diagnostic devices to boost healthcare in the developing world (Medical Design & Outsourcing). *Aug. 2017*.
9. BU magazine featured our research group. *Aug. 2017*.
10. Many news agencies highlighted our work on saliva-based biobatteries published in Advanced Materials Technologies. The media outlets include Sciencedaily, Popular Mechanics, IFLScience, Electronics360, Foxnews, and many others. *Aug. 2017.*
11. Our high school student who worked in our lab during 2016 Summer won high awards in many research competition including Intel International Science & Engineering Fair (1st), Long Island Science & Engineering Fair (1st), New York State Science & Engineering Fair (2nd), Long Island Science Congress (Highest Honors), and WAC Lighting Foundation Invitational Science Fair (2nd).
12. New York State's Empire State Development highlighted our research group (https://esd.ny.gov/esd-media-center/esd-blog/higher-ed-fuels-energy-innovation). *Jun. 2017*.
13. A SUNY BU video clip featured our group's work (biobatteries), *Mar. 2017* - http://ws.binghamton.edu/choi/BU.html
14. Many news agencies highlighted our work on biological solar cells published in Journal of Power Sources. The media outlets include Phys.org, Sciencedaily, ScienceNewsline, Electronicproducts, Healthmedicinet, and many others. *Mar. 2017*.
15. Our work was selected as a finalist paper for one of the best paper contests at the IEEE MEMS 2017.
16. Many news agencies highlighted our work on bacteria-powered battery on single sheet of paper published in Advanced Materials Technologies and IEEE MEMS 2017 Conference proceeding. The media outlets include Sciencedaily, Sciencenewsline, Newswise, Esciencenews, Eurekalert, Smithsonian, NSF news and many others. *Dec. 2016*.
17. We won best poster award at the "Science-to-Technology Day" 2016 Workshop (CREATES). *Nov. 2016.*
18. Our origami ninja star battery gained significant attention from the community and was reported on in media outlets, including NSF Science360 News, Discover-e, ScienceDaily, SpaceDaily, Science Newsline, Innovation Toronto, Materialsgate, Arts Insiders, and e-Science News. *Jun. 2016.*
19. Our Bio-solar panel was selected as the top 10 technologies shaping the future of solar power in Livemint News. *Jun. 2016.*
20. Our Bio-solar panel gained significant attention from the community and was reported on in media outlets, including ScienceDaily, ECN Magazine, NDTV.com, ZME Science, Siliconrepublic, CIOL, AZO Cleantech, The Stack, Crazy Engineers, The Engineer, Business Standard, Silicon India, Energy Matters, News Nation, Before it's New, New Energy and Fuel, Nature World News, Solar Energy News, and e! Science News. *Apr. 2016.*
21. Our high school student who worked in our lab during 2014 & 2015 Summer won the first place in the medicine and health category at WESEF 2016. *Mar. 2016.*
22. Our news articles were selected as the top story and the number two story for 2015 on Binghamton Research Discover-e. *Jan. 2016.*
23. Our origami paper-based battery was selected as the top technology of "The Most Impressive Technologies of 2015" in Qmed Medical Product Manufacturing News. *Jul. 2015.*
24. Our origami paper-based biofuel cell work was reported by Time Warner Cable News, Newsweek Europe, Electronics Weekly (UK), Dutch Magazine KIJK, BBC Focus Magazine, TreeHugger, ScienceDaily, IEEE Spectrum, Lab Maganer Magazine, Health News Digest, Digital Trend, and Discover-e Newsletter at Binghamton University. *Jul. 2015.*

25. Our micro-sized bio-solar cell was reported by Materials 360 (MRS's online publication), Solar Novus Today, Pipe Dream News and Discover-e Newsletter at Binghamton University. *Feb. 2015.*
26. Our micro-sized bio-solar cell was featured on the cover of Lab Chip Journal. *Oct. 2014.*
27. "Ask a Scientist" Column posted on our article, "How does bio-fuel work?" *Mar. 2013.*

■ STUDENTS

1. Ph.D. students (Current)

1. Yang Gao (2015~Present): Paper-/textile-based biobatteries (Supported by NSF & ONR)
2. Maedeh Mohammadifar (2015~Present): Self-powered Biosensors (Supported by NSF & ONR)
3. Lin Liu (2016~Present): Bio-solar cells (Supported by NSF)
4. Mehdi Tahernia (2016~Present): Biosensing Arrays (Supported by NSF & IEEC)
5. Jihyun Ryu (2019~Present): Soft Robotics & Biofuel Cells (TA & supported by ONR for summer)
6. Shuai Feng (2019~Present): Bio-solar Cells (TA & supported by ONR for summer)

-Ph.D. Alumni

1. Arwa Fraiwan (2012~2016); Postdoc at Case Western Reserve University
   Dissertation: A paper-based biofuel cell for on-chip biosensors

2. M.S. students (Current)

1. Jonghyun Cho (2019~Present): Biosensors (Supported by IEEC)

-M.S. Alumni (Thesis)

2. Sumiao Pang (2016~2017, BME); Engineer at Vigene Biosciences
   Thesis: Flexible and Stretchable Microbial Fuel Cells
3. Weiyang Yang (2015~2016, ECE); Ph.D. student at Michigan State University
   Thesis: A microbial fuel cell-based biosensor for water quality monitoring
4. Xuejian Wei (2015~2016, ECE); Engineer at Intelligent Automation
   Thesis: µL-scale biological solar cells
5. Gihoon Choi (2013~2015, ECE); Ph.D. student at Penn State University
   Thesis: A paper-based sensor array for electromicrobiology

-M.S. Alumni (Project)

1. Jason Ephraim (2018~2019, ECE, Engineer at Harris Corp.) - Project: Nanogenerator
2. Madhura R. Shanbhag (2016~2017, BME) - Project: 3-D culture systems for C. elegans
3. Mark Freithaler (2016~2017, ECE, Engineer at MACOM) – Project: Sweat-based microbial fuel cells
4. Kamil Roszkowski (2015~2016, ECE, Engineer at General Dynamics) – Project: Biofuel production in Microfluidics
5. Jiem Nguyen (2014~2015, ECE, Engineer at National Grid) – Project: UV LED-based photolithography systems
6. Shannon Rosario (2013~2014, ECE) – Project: A Lab-on-a-chip for circulating tumor cells

3. B.S. students (Current)

1. Currently None

-B.S. Alumni (Selected)

1. Jinho Yoo (2019, BME) – B.S. student at USC
2. Hail Chun (2019, ME) – Engineer at Protec, INC (Korea)
3. Timothy S Kim (2017, ECE) - Engineer at National Security Agency
4. Christopher Coogan (2016, BE) - PH.D. student at University of Minnesota
5. Weiye Li (2016, ECE) - M.S. student at ETH Zurich
6. Jiaqi Zhang (2015, ECE) - M.S. student at National University of Singapore
7. Bonnie Tran (2014, ECE) - M.S. student at Colombia University
8. WanChao Guo (2014, ECE) - Engineer at GE Aviation
9. San Yoon (2014, Bio) - Medical Student at St. George's University
10. Hankeun Lee (2014, ECE) - US ARMY
11. Simeng Chen (2014, ECE) - PH.D. student at University of Colorado Boulder
12. Chunhui Dai (2014, ECE) - PH.D. student at University of Minnesota

13. Thu Nguyen (2014, ECE) - PH.D. student at University of Waterloo
14. Steven J. Sundermier (2013, ECE) - Engineer at BAE systems

- Advised more than 40 undergraduate students (since 2012)
- More than 50% of them currently in pursuit of M.S. or Ph.D degrees
- About 25% of them - research fellowship/scholarship awardees
- Co-authored more than 27 publications

4. NSF REU Program

1. Alexa Juran (2017 Summer) from Broome Community College
2. Landen Kwan (2015 Summer) from Queensborough Community College
3. Taneesha Beebe (2014 Summer) from Russel Sage College

5. Other Undergraduate Programs

1. Bryanna Brown (2017 Summer): Louis Stokes Alliance for Minority Participation (LSAMP) - M.S. student at Carnegie Mellon University
2. Junle Lu (2014 Summer): LAAMP/McNair Summer Research Program

6. High School Students

1. Dalton Peng (2017 Summer) from Mount Hebron High School
2. Kendra Zhang (2016 Summer) from Jericho High School – won high awards in many research competitions including Intel International Science & Engineering Fair (1st), Long Island Science & Engineering Fair (1st), New York State Science & Engineering Fair (2nd), Long Island Science Congress (Highest Honors), and WAC Lighting Foundation Invitational Science Fair (2nd). (Currently student at Colombia University)
3. Chris Fischer (2014 Summer & 2015 Summer) from Briarcliff High School – won Arizona State University Sustainability Solutions Initiative Award (Currently student at the University of Pennsylvania)
4. Reed Walter (2011 Summer) from Loveland High School Biotechnology Program - ranked second in his class for the capstone competition (Currently student at Ohio State University)

➢ **Awards/Fellowships/Scholarships of Students Supervised**

1. Maedeh Mohammadifar – 2019 BU Graduate Student Excellent Award in Research
2. Maedeh Mohammadifar – 2018 Department PHD Research Award
3. Do Hoon Yong – 2016 S3IP Undergraduate Research Initiative
4. Weiyang Yang – 2016 Department MS Research Award
5. Christopher G Coogan – 2015 Summer Scholars and Artists Scholarship
6. Gihoon Choi – 2015 Department MS Research Award
7. Arwa Fraiwan – 2015 Department PHD Research Award
8. Christopher G Coogan – 2015 Undergraduate Research Award
9. Kamil Roszkowski – 2015 Undergraduate Research Award
10. Jun Myung Song – 2015 Undergraduate Research Award
11. Erin E Small – 2015 Undergraduate Research Award
12. Jiang Wu– 2015 Undergraduate Research Award
13. Timothy S Kim – 2015 Undergraduate Research Award
14. Weiye Li – 2015 Undergraduate Research Award
15. Jiaqi Zhang– 2014 Undergraduate Research Award
16. Jiaqi Zhang– 2014 S3IP Undergraduate Research Initiative
17. Diandra Hassan– 2014 Summer Scholars and Artists Scholarship
18. Chunhui Dai – 2014 Department BS Research Award
19. Chunhui Dai – 2013 Undergraduate Research Award
20. Chunhui Dai – 2013 Summer Scholars and Artists Scholarship
21. Hankeun Lee– 2013 S3IP Undergraduate Research Initiative
22. Arwa Fraiwan – 2013 Travel Support by the GSEU Professional Development Award

➢ **Other MS & PHD Committees**

1. Huayan Wang (ME) – 2019 PH.D. Committee (Outside examiner)
2. Matthew S. Brown – (BME, 2018 ~ Present) PH.D. Committee
3. Ganesh Sainadh Gudavalli – (EE, 2018 ~ Present) PH.D. Committee

4. Farshad Azadian – (EE, 2017 ~ Present) PH.D. Committee
5. Faruk Ballipinar – (EE, 2015 ~ 2018) PH.D. Committee
6. Navjot Kaur Sidhu – (EE, 2014~2016) PH.D. Committee
7. Mikhail A Coloma – (EE, 2014~2017) PH.D. Committee
8. Robert Congdon (CHEM) – 2014 PH.D. Committee (Outside examiner)
9. Benjamin Heo (BME) – 2019 M.S. Committee
10. Youjoong Park (BME) – 2018 M.S. Committee
11. Avinav Verma (EE) – 2015 M.S. Committee
12. Sandeep Singh (EE) – 2015 M.S. Committee
13. William Marin (EE) – 2014 M.S. Committee