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Ressa Reneth Sarreal

5th-Year ECE PhD Candidate

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Portfolio: rsarreal3.github.io

Current 4th-year Electrical and Computer Engineering (ECE) PhD Candidate at the Georgia Institute of Technology (GT) with 6+ years experience developing biomedical technology such as magnetic stimulators and self-powered glucose sensors. **Areas of expertise:** neurophysics, biomedical devices, analog design, digital design, MEMS, object-oriented programming, electromagnetism. **Impact:** Actively working towards diversifying the working community through program development, mentorship, and coaching.

Education

Doctor of Philosophy, ECE | Georgia Institute of Technology, GPA: 3.76/4.00 — **Aug 2018 — Present**

Master of Science, ECE | Georgia Institute of Technology, GPA: 3.75/4.00 — **Aug 2018 — May 2020**

Bachelor of Science, Computer Engineering | University of Maryland, Baltimore County, GPA: 4.00/4.00 — **June 2014 — May 2018**

Experience

Graduate Research Assistant — **Aug 2018 — Present**
Translational BioSystems Group, GT — Atlanta, GA

Electrical Hardware Design Intern — **May 2021 — Aug 2021**
Honeywell Aerospace — Clearwater, FL

Graduate Student Senator — **Jan 2021 — May 2021**
Graduate Student Government Association, GT — Atlanta, GA

Instrumentation and Electronics Laboratory GTA — **Aug 2018 — Dec 2018**
School of Electrical and Computer Engineering, GT — Atlanta, GA

Research Assistant and Project Lead — **Dec 2015 — May 2018**
BioElectronics Laboratory, UMBC — Baltimore, MD

Peer Advisor — **May 2016 — May 2018**
Meyerhoff Scholars Program, UMBC — Baltimore, MD

Initiation Coordinator and Corresponding Secretary — **May 2016 — May 2018**
Tau Beta Pi Engineering Honor Society, UMBC — Baltimore, MD

Programmable Logic Devices TA — **Jan 2018 — May 2018**
Department of Computer Science and Electrical Engineering, UMBC — Baltimore, MD

C Programming and Embedded Systems TA — **Aug 2017 — Dec 2017**
Department of Computer Science and Electrical Engineering, UMBC — Baltimore, MD

Assistant Secretary — **Aug 2016 — May 2017**
IEEE Student Chapter, UMBC — Baltimore, MD

Electronic Circuits TA — **Jan 2017 — May 2017**
Department of Computer Science and Electrical Engineering, UMBC — Baltimore, MD

Research Intern — **June 2016 — Aug 2016**
Robotics Institute, Carnegie Mellon University — Pittsburgh, PA

Physics I/II Learning Assistant — **Jan 2015 — May 2016**
Department of Physics, UMBC — Baltimore, MD

Development Intern — **June 2015 — Aug 2015**
Empathic Design and Technology Lab, Drexel University — Philadelphia, PA

Skills

Languages	English (Native), Tagalog (Proficient), Spanish (Educational Level)
Programming	C/C++, Python, Assembly, Verilog, VHDL
Hardware	MEMS cleanroom fabrication, Micro-scale soldering, 3D printing, Aerosol jet printing, Inkjet printing, Parylene coating, Profilometer characterization, Laser cutter
Software	MATLAB, COMSOL, LTSpice, PSpice, Cadence, AutoCAD, Fusion 360, Eagle PCB design, Xilinx ISE, Vivado, Visual Studio, ROS

Publications and Conferences

1. **RR Sarreal**, D Blake, P Bhatti, "Development and Characterization of a Micromagnetic Alternative to Cochlear Implant Arrays", *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 20(21), 6087, 2022.
2. **RR Sarreal**, P Bhatti, "Development of Cochlear Implant Alternative Magnetic Stimulation Design" [Oral Presentation], *American Cochlear Implant Alliance Conference*, 2022.
3. **RR Sarreal**, P Bhatti, "Characterization and Miniaturization of Silver-Nanoparticle Microcoil via Aerosol Jet Printing Techniques for Micromagnetic Cochlear Stimulation", *Sensors*, 20(21), 6087, 2020.
4. **RR Sarreal**, and P Bhatti, "Development of Silver-Nanoparticle-Based Microcoil for Electromagnetic Cochlear Stimulation" [Oral presentation], *15th annual IEEE International Conference on Nano/Micro Engineered and Molecular Systems* 2020.
5. **R Sarreal**, and G Slaughter, "Dual Glucose and Lactate Electrochemical Biosensor" [Oral presentation], *13th annual IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, pp 64-67, 2018.
6. T Kulkarni, A Holtschneider, **RR Sarreal**, and G Slaughter, "Dynamic modeling of direct electron transfer PQQ-GDH MWCNTs bioanode function" [Oral presentation], *12th annual IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, pp 379-382, 2017.
7. **RR Sarreal**, T Mueller-Sim, and G Kantor, "Development of LIDAR-based, Autonomous Agricultural Robot Navigation Guidance System" [Poster presentation], *OurCS*, 2017.
8. **RR Sarreal**, T Kulkarni, and G Slaughter "Self-Powered Glucose Sensor" [Poster presentation], *Annual Biomedical Research Conference for Minority Students*, 2016.
9. G Marcu, N Dowshen, S Saha, **RR Sarreal**, N Andalibi, "TreatYoSelf: Empathy-driven behavioral intervention for marginalized youth living with HIV", *Proceedings of the 10th EAI International Conference on Pervasive Computing Technologies for Healthcare*, pp 69-76, 2016.

Projects

Details are available online at the portfolio website: rsarreal3.github.io

Robot Swarm Tracking, Digital Image Processing, GT	**May 2020 — Aug 2020**
Health Classification using Cell Test Features, Machine Learning in Biosciences, GT	**Jan 2020 — May 2020**
Parcel Tracking System, Capstone, UMBC	**Aug 2017 — May 2018**
Two-Way Set-Associative Cache, Principles of VLSI Design, UMBC	**Jan 2018 — May 2018**
FPGA Pong, Programmable Logic Devices, UMBC	**Jan 2018 — May 2018**
Parallelized MIPS Instruction Pipeline, Computer Architecture, UMBC	**Aug 2017 — Dec 2017**
Microcontroller Music Box, C Programming and Embedded Systems, UMBC	**Aug 2017 — Dec 2017**
UDP TicTacToe, Computer Networks, UMBC	**Aug 2017 — Dec 2017**

Extracurricular Activities and Service

Member, UMT Student Program Committee, GT	**Aug 2020 — Present**
Member (Brown-Black Belt), Tech Taido, GT	**Aug 2018 — Present**
Member, Yellow Jacket Roller Derby, GT	**January 2022 — Present**
Member, Club Gymnastics, GT	**January 2022 — Present**
Member (1st-Degree Black Belt), Tech TKD, GT	**Aug 2019 — December 2022**
Volunteer, Fernbank LINKS	**April 2019**
Member (1st-Degree Black Belt), Club Taekwondo, UMBC	**Aug 2014 — Aug 2018**
Volunteer, Movable Feast	**Oct 2016**
Volunteer, First Lego League	**Oct 2014, Oct 2015**

Awards & Honors

2018 GT President's Fellowship
2016 MARC U*STAR Scholar
2014 Meyerhoff Scholar; National Security Agency Scholar; Dean's List (for next four consecutive years); President's List (for next four consecutive years)