

Swagat Bhattacharyya

(304) 282-2350 | 100 10th St. NW, Atlanta, GA 30309 | sbhattach8@gatech.edu

EDUCATION

Georgia Institute of Technology

Masters of Science in Electrical Engineering | Advisor: Prof. Jennifer O. Hasler

Thesis: Neuromorphic Approaches for Asynchronous Computing and Sensing

Atlanta, Georgia | May 2024

GPA: 3.87

Purdue University, Honors College

Triple Major: BSE Electrical Engineering, BS Applied Physics, & BS Mathematics

West Lafayette, IN | May 2022

GPA: 3.96 (Highest Distinction)

RELEVANT HARDWARE SKILLS

- Mixed-Signal Design & Layout (28 nm & 180 nm)
- Flash (FG) Design, Programming, & Characterization
- Automated Test & Measurement (Analog Post-Si Verification)
- PCB Schematic Design and Layout (IPC Class II)
- FPGA | Signal Proc. | Semiconductors | Circuit Macromodels

RELEVANT SOFTWARE SKILLS

- Cadence Virtuoso
- Cadence Spectre & Spice
- Matlab, Python, & C (Console & Ebed)
- Altium Designer & KiCad
- Linux Environments

RELEVANT WORK EXPERIENCE [KEY: Filled Bullets => Hardware | Hollow Bullets => Software]

Graduate Research Fellow, Integrated Computational Electronics Lab, Georgia Tech (Current) Since Aug. 2022

- Designed and taped out *two chips* using floating-gate (FG) FETs in 28 nm and 180 nm CMOS: Designed a 6b DAC, FG-based mixer, FG Bootstrap source, I&F neurons, strong ARM latch, and HV decoders for FG programming.
- Characterized FG FET circuits and developed FG FET programming algorithms in 65 nm CMOS.
- Led a team that demonstrated the first analog sorting algorithms (oral presentation at IEEE ICRC 2023).
- Led a development team for efficient C, MATLAB, & Python models of transistor-based HH neuron networks.
- Led a team that developed a fast DAE-driven simulation suite for analog architectural exploration.

Embedded Design Engineer, Lune Systems, Atlanta, GA

(Current) Since Oct. 2023

- Led PCB design & testing for a smart insomnia sleep aid.
- Developed embedded software for the aid.

Hardware Design Engineer, Neurava LLC, West Lafayette, IN

May 2021 – July 2022

- Led electronics design for a seizure classification sensor array which has undergone clinical testing since 2022.
- Wrote embedded DSP and controls software for the sensor array; wrote automatic characterization protocols.

Undergraduate Research, Center for Implantable Devices, Purdue University

Jan. 2021 – May 2021

- Designed, simulated, and characterized a high-order filter for a novel implantable gastric monitoring sensor.

Undergraduate Research, Computational Electronic Systems Lab, West Virginia Univ.

June 2014 – June 2022

- Developed a quadrature, OTA-C sine VCO with the widest reported tuning range via a novel envelope detector.
- Developed analog ML algorithms for an acoustic vehicle classifier on a field-programmable analog array.

PATENTS & JOURNAL PAPERS (Extended List Available At: <https://tinyurl.com/vc66j52v>)

Patents	1	Bhattacharyya S, Ganesh V, Hsiung Y, Meyer T, & Shah J, "Multi-Modal Seizure Sensor Array," Provisional filed in March, 2022; Full patent filed in March, 2023.
	2	Bhattacharyya S & Hasler J, " Extrema-Triggered Conversion for Non-Stationary Signal Acquisition in Wireless Sensor Nodes ," JLPEA, vol. 14, no. 1, February, 2024
Journals	2	Bhattacharyya S, Ayyappan PR, & Hasler J, " Towards Scalable Digital Modeling of Networks of Biorealistic Silicon Neurons ," IEEE JETCAS, vol. 13, no. 4, pp. 927-939, December, 2023
	3	Bhattacharyya S & Graham DW, " Amplitude-Regulated Quadrature Sine-VCO Employing an OTA-C Topology ," IEEE Transactions on Circuits & Systems II: Express Briefs, vol. 70, no. 6, pp. 1886-1890, June 2023
	4	Bhattacharyya S, Andryczik S, & Graham DW, " An Acoustic Vehicle Detector & Classifier Using a Reconfigurable Analog/Mixed-Signal Platform ," JLPEA, vol. 10, no. 1, Article 6, March-April, 2020

HONORS & AWARDS + LEADERSHIP EXPERIENCE

IEEE Intl. Conf. Rebooting Computing Best Short Paper Award	2023
NSF Graduate Research Fellowship (GRFP) & Georgia Tech Presidential Fellowship	2022
President Purdue IEEE Student Branch :: Oversaw 11 committees with ~200 members in total	2020-21
Purdue Math Dept. Gordon L. Walker Scholarship and Physics & Astronomy Dept. Scholarship	2021
Vice President Purdue IEEE Student Branch :: Oversaw operations of six technical committees	2019-20
Electrical Design & Fabrication Lead Purdue IEEE Engineering in Medicine & Biology Society	2019-20, 21-22
2 nd pl. Embed. Syst., Intel ISEF – honored with asteroid: 34619 Swagat ; Purdue Trustees Scholarship	2018