Shree Hari Sureshbabu
Ph.D. Student
Purdue University

Elmore Family School of Electrical and Computer Engineering
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EDUCATION

2018 – Present **Ph.D.** in Electrical and Computer Engineering
Purdue University, West Lafayette, Indiana, USA
GPA: 3.67/4.00

2014 - 2018 **B.E** in Electrical and Electronics Engineering
M.S. Ramaiah Institute of Technology, Bangalore, Karnataka, India
GPA: 9.52/10.0

SKILLS

Programming Languages: C/C++, Java, HTML, Python, Bash

Libraries: PyTorch, TensorFlow, Keras, NumPy, PennyLane, Qiskit

Software and Tools: Silvaco TCAD, MATLAB, LabVIEW, Origin, Git, Cadence Virtuoso

RESEARCH EXPERIENCE

Aug'18 – Present **Graduate Research Assistant,** School of Electrical and Computer Engineering**,**
Purdue University, West Lafayette
Advisors: Prof. Sabre Kais & Prof. Zubin Jacob
Research: Classical and Quantum Machine Learning for physics-based simulations.
Achievements:

- *A Restricted Boltzmann Machine based Quantum Machine Learning algorithm was developed that could be implemented on near-term quantum computers to study the electronic structure and many-body properties of materials.*
- *Implemented classical machine learning based network for photonic applications.*
- *Worked on a team that showed the usage of Büttiker probes within the NEGF framework in comparison to state-of-the-art industrial Drift-Diffusion models.*

Nov'17 – April'18 **Research Student, Undergraduate Thesis,** Centre for Nano Science and Engineering
Indian Institute of Science, Bangalore
Advisor: Prof. Digbijoy N. Nath
Achievements: Modeled MoS2/GaN heterostructure based vertical photodetector for deep UV applications and worked closely with experimentalists to understand the carrier transport in the device.

June'17 – Aug'17 **Summer Research Intern,** Polymer Processing Laboratory**,**
Centre for Nano Science and Engineering Indian Institute of Science, Bangalore
Advisor: Prof. S.A. Shivashankar
Achievements: First ever demonstration of synthesizing self-assembled Cu_2S nanoparticles using microwave irradiation.

Aug'16 – June'17 **Research Assistant,** Department of Medical Electronics, M.S. Ramaiah Institute of Technology, Bangalore
Advisors: Prof. Sriraam. N and Dr. A.S. Hegde (Director - Neurosurgeon, M.S. Ramaiah Memorial Hospital, Bangalore)

Achievements: Achieved state-of-the-art classification accuracy by processing Electroencephalogram data for the real-time detection of focal epileptic seizures using an SVM classifier.

June'16 – Aug'16 **Summer Research Intern**
Polymer Processing Laboratory, Centre for Nano Science and Engineering
Indian Institute of Science, Bangalore
Advisor: Prof. S.A. Shivashankar
Achievements: First ever demonstration of synthesizing delafossite $CuAlO_2$ nanoparticles using microwave irradiation.

RELEVANT COURSES

Aug'20 – Oct'20 ***Online course on "Quantum Cryptography" (edX course) (Audit)***
Instructor: Prof. Thomas Vidick
California Institute of Technology.

Aug'20 – Dec'20 ***CHM 696 "Quantum Information and Computation for Chemistry"***
Instructor: Prof. Sabre Kais
Purdue University.

Jun'20 – Aug'20 ***Online course on "Quantum Mechanics and Quantum Computation" (edX course)***
Instructor: Prof. Umesh Vazirani
University of California, Berkeley.

Jul'19 – Sep'19 ***Online course on "Quantum Machine Learning" (edX course)***
Instructor: Prof. Peter Wittek
University of Toronto.

PUBLICATIONS

- Khalid, Bilal, ***Shree Hari Sureshbabu***, Arnab Banerjee, and Sabre Kais. "Finite-Size Scaling on a Digital Quantum Simulator using Quantum Restricted Boltzmann Machine." *arXiv preprint arXiv:2202.00112* (2022).
- Sajjan, Manas, Junxu Li, Raja Selvarajan, ***Shree Hari Sureshbabu***, Sumit Suresh Kale, Rishabh Gupta, and Sabre Kais. "Quantum computing enhanced machine learning for physico-chemical applications." *arXiv preprint arXiv:2111.00851* (2021).
- Sajjan, M., ***Sureshbabu, S. H.***, & Kais, S. (2021). Quantum Machine-Learning for Eigenstate Filtration in Two-Dimensional Materials. *Journal of the American Chemical Society*, *143*(44), 18426–18445. doi:10.1021/jacs.1c06246
- ***Sureshbabu, Shree Hari***, Manas Sajjan, Sangchul Oh, and Sabre Kais. "Implementation of Quantum Machine Learning for Electronic Structure Calculations of Periodic Systems on Quantum Computing Devices." *Journal of Chemical Information and Modeling* (2021).
- Wang, K. C., Grassi, R., Chu, Y., ***Sureshbabu, S. H.***, Geng, J., Sarangapani, P., ... & Kubis, T. "Introduction of Multi-particle Büttiker Probes--Bridging the Gap between Drift Diffusion and Quantum Transport". Journal of Applied Physics **128**, 014302 (2020).

AWARDS

- SILVACO commendation for tier-I publication, 2020.
- Meissner Fellowship, Purdue University.
- Award for Academic Achievement by BEML Limited, 2014.
- Samskruthi Award by Janmabhoomi Samskruthika Nagarikara Vedike, Bangalore, 2012.
- State Bank of India Scholarship.