Sairam Sri Vatsavai

Sairam Sri Vatsavai | LinkedIn | Sairam954 (Sairam Sri Vatsavai) (github.com) | +1 937-838-9577 | SSR226@uky.edu

EDUCATION

Doctor of Philosophy, Electrical Engineering — *Aug 2019 - Present*
University of Kentucky — **GPA**: **4.0**

Bachelor of Technology, Electronics and Communication Engineering — *Aug 2012 – May 2016*
Jawaharlal Nehru Technological University — **GPA**: **3.75**

EXPERIENCE

Graduate Research Assistant, Unconventional Computing Architectures and Technologies Lab — *Aug 2019 - Present*

- Researching in the area of ***Silicon Photonics*** under the supervision of Dr. Ishan Thakkar. My research is supported by grant from national science foundation (NSF) (NSF-2139167).

Machine Learning Engineer Intern, JobCupid.ai — *May 2021 - Aug 2021*

- Developed ***ML algorithm*** that improved the search and match feature of JobCupid for new graduate students. Created ***ReactJS based user interface*** for on campus module of JobCupid.

Graduate Teaching Assistant, University of Kentucky — *Aug 2019 - May2021*

- Taught ***Embedded Systems Lab***, ***Computer Architecture***, and ***Introduction to VLSI*** courses to sophomore and junior undergraduate students in the department of electrical and computer engineering.

Software Developer, Epam Systems — *July 2016 - July 2019*

- Worked with Workfusion's ***ML models*** and ***Robotic Process Automation solutions*** to automate business usecases for banking and financial clients.

RESEARCH FOCUS

- **Design and Optimization of Photonic Integrated Circuits based AI Accelerators**
- **Energy Efficient Photonic Interconnects for Manycore Computing**
- **Design of Stochastic Computing based Photonic Accelerators for inference of Deep Neural Networks**
- **Modelling, Simulation and Analysis of Silicon Photonic Passive and Active Devices and Circuits**

PUBLICATIONS

- **Sairam Sri Vatsavai,** V. S. P. Karempudi, Ishan Thakkar, Todd Hastings and Ahmed Salehi, **SCONNA: A Stochastic Computing Based Optical Accelerator for Ultra-Fast, Energy-Efficient Inference of Integer-Quantized CNNs,** Accepted at *IEEE International Parallel and Distributed Processing Symposium (IPDPS)* 2023**. (Conference Publication)**
- **Sairam Sri Vatsavai,** V. S. P. Karempudi and Ishan Thakkar, **An Optical XNOR-Bitcount Based Accelerator for Efficient Inference of Binary Neural Networks,** Accepted at *International Symposium on Quality Electronic Design (ISQED*) 2023. **(Conference Publication)**
- V. S. P. Karempudi, **Sairam Sri Vatsavai**, Ishan Thakkar and Todd Hastings, **A Polymorphic Electro-Optic Logic Gate for High-Speed Reconfigurable Computing Circuits,** Accepted at *International Symposium on Quality Electronic Design (ISQED*) 2023. **(Conference Publication)**
- S. M. Shivanandamurthy, **Sairam Sri Vatsavai**, Ishan Thakkar and S. A. Salehi, **AGNI: In-Situ, Iso-Latency Stochastic-to-Binary Number Conversion for In-DRAM Deep Learning,** Accepted at *International Symposium on Quality Electronic Design (ISQED*) 2023. **(Conference Publication)**
- **Sairam Sri Vatsavai** and Ishan Thakkar **A Bit-Parallel Deterministic Stochastic Multiplier,** *International Symposium on Quality Electronic Design (ISQED*) 2023. **(Conference Publication)**
- **Sairam Sri Vatsavai** and I. G. Thakkar, **Photonic Reconfigurable Accelerators for Efficient Inference of CNNs With Mixed-Sized Tensors**, in *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 41, no. 11, pp. 4337-4348, Nov. 2022. **(Journal Publication)**
- Thakkar, I.G., Chittamuru, S.V.R., Bhat, **Sairam Sri Vatsavai** , Pasricha, S, **Securing Silicon Photonic NoCs Against Hardware Attacks**. In: Mishra, P., Charles, S. (eds) Network-on-Chip Security and Privacy. Springer, Cham. **(Book Chapter)**

- **Sairam Sri Vatsavai** and I. Thakkar, **Silicon Photonic Microring Based Chip-Scale Accelerator for Delayed Feedback Reservoir Computing**, 2021 34th International Conference on VLSI Design and 2021 20th *International Conference on Embedded Systems (VLSID)*, Guwahati, India, 2021, pp. 129-134. **(Conference Publication)**
- **Sairam Sri Vatsavai**, V. S. P. Karempudi and I. Thakkar, **PROTEUS: Rule-Based Self-Adaptation in Photonic NoCs for Loss-Aware Co-Management of Laser Power and Performance,** 2020 14th *IEEE/ACM International Symposium on Networks-on-Chip (NOCS)*, Hamburg, Germany, 2020, pp. 1-8. **(Conference Publication)**
- V Sai Praneeth Karempudi, **Sairam Sri Vatsavai**, and Ishan Thakkar. 2020. **Redesigning Photonic Interconnects with Silicon-on-Sapphire Device Platform for Ultra-Low-Energy On-Chip Communication**. In Proceedings of the 2020 on *Great Lakes Symposium on VLSI (GLSVLSI '20)*. Association for Computing Machinery, New York, NY, USA, 247–252. **(Conference Publication)**
- S. V. R. Chittamuru, I. G. Thakkar, S. Pasricha, **Sairam Sri Vatsavai** and V. Bhat, **Exploiting Process Variations to Secure Photonic NoC Architectures From Snooping Attacks**, in *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 40, no. 5, pp. 850-863, May 2021. **(Journal Publication)**

HONORS AND AWARDS

- **Best Computer Student award** at annual research symposium of Electrical and Computer Engineering department, University of Kentucky, April 2022.
- **Best Doctoral Student award** at annual research symposium of Electrical and Computer Engineering department, University of Kentucky, April 2022.
- NSF-funded student participation support to attend **IEEE International Green and Sustainable Computing Conference (IGSCC),** October 2020.
- **Best Learning and Development Mentor award** for training colleagues on Workfusion ML and Automation Solutions, EPAM systems, February 2019.
- **Fearless Problem Solver award** for successfully implementing cricital projects with several client appreciations, EPAM systems, April 2018.

SKILLS

Photonic Simulation Tools: Ansys Lumerical
Programming Languages: Python, Java, C++, Matlab and C
ML Frameworks: Pytorch, Keras Tensorflow, Xilinx Brevitas, PyG and Scikit Learn
Open Source Simulators: DSENT, CACTI, Gemm5, STONNE, and Timeloop
Web Development Technologies (Novice): ReactJS, NodeJS, AngularJS, HTML, and CSS
Databases : MongoDB, MySQL, and PostgreSQL

Other Tools: Workfusion, Eclipse, Visual Studio Code, PyCharm, Postman, S3 browser, Spyder, Google Collab, Notepad++, MS Office Suite, WinSCP, Putty, and Oracle VM.

COURSEWORK

Photonics Integrated Circuits, Solid State Electronics, Electromagnetic Fields, Machine Learning (ML), Advanced Computer Architecture, Digital Computer Structure, Deep Learning with Math, Bayesian Machine Learning, Large Scale Data science

CERTIFICATIONS

- **DeepLearning.AI TensorFlow Developer Specialization**
- **NVIDIA Fundamentals of Accelerated Computing with CUDA Python**
- **Workfusion ML Engineer**