

Education

2019 - **Ph.D. in Electrical Engineering**

Present Drexel University, Philadelphia, Pennsylvania

Focus: Machine Learning for Physical Design | **Advisor:** Dr. Ioannis Savidis

2012 - 2016 **Bachelors in Computer Engineering**

Kathmandu University, Dhulikhel, Kavre, Nepal

Work Experience

Aug 2019 - **Graduate Researcher**, Integrated Circuits and Electronics Lab, Drexel University

Present ○ Representation learning guided electronic design automation.

- Developed an integrated framework for large scale circuit design dataset generation [1] and rapid prototyping of deep learning models [2].
- Modelled graph based neural networks to predict timing [3] and interconnect impedance [4].

○ Hardware security and sequential circuit obfuscation.

- Developed synthesis algorithm and security metric for FSM locking [5] achieving 8.53x increase in security.
- Implemented sequential logic locking techniques on 65nm technology node for tapeout.

Oct 2024 - **Visiting Graduate Student**, VLSI CAD Laboratory, University of California San Diego

Mar 2025 ○ Integration and benchmarking of graph-based physical design timing prediction and optimization models into academic placement and routing tools.

Jan 2018 - **Engineering Consultant**, Leapfrog Technologies

Jun 2019 ○ Led the development of Ed-Fi Alliance Analytics Middleware, enabling efficient synthesis and reporting of Texas school district data.

○ Created a YAML-based domain specific language for rapid query generation, data extraction, and reporting.

○ Built a RESTful API for client applications and a tool for monitoring server traffic.

Jun 2017 - **Software Engineer**, Beta Analytics

Jun 2019 ○ Developed NEPSEguide, a pricing and risk analytics tool for financial risk management.

○ Designed systems for data entry and warehouse schema for historical stock data.

○ Implemented predictive metrics and developed tools for stock analysis and performance charting.

Nov 2016 - **Associate Developer**, Logic Information Systems

Jun 2017 ○ Implemented Oracle Retail Analytics data warehousing and business intelligence solutions.

○ Provided 24/7 technical support and client consultation for ETL processes.


Selected Publications

- [1] **P. Shrestha** et al. "EDA-schema: A graph datamodel schema and open dataset for digital design automation". *Proceedings of the ACM Great Lakes Symposium on VLSI (GLSVLSI)*. June 2024, pp. 1–8.
- [2] **P. Shrestha** and I. Savidis. "EDA-ML: Graph representation learning framework for digital IC design automation". *Proceedings of the International Symposium on Quality Electronic Design (ISQED)*. Apr. 2024, pp. 241–246.
- [3] **P. Shrestha**, S. Phatharodom, and I. Savidis. "Graph representation learning for gate arrival time prediction". *Proceedings of the ACM/IEEE Workshop on Machine Learning for CAD (MLCAD)*. Sept. 2022, pp. 127–133.
- [4] **P. Shrestha** and I. Savidis. "Graph representation learning for parasitic impedance prediction of the interconnect". *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*. May 2023, pp. 1–5.
- [5] **P. Shrestha** and I. Savidis. "Synthesis of coupling capacitance based hidden state transitions for sequential logic locking". *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS)*. May 2022, pp. 1734–1738.

Skills

Languages	Python, Verilog, VHDL, Bash, TCL, SQL (Expertise) R, Matlab, Java, Javascript, VBScript, C++, C (Working Knowledge)
EDA	Synopsys: DC Compiler, IC Compiler, PrimeTime; Cadence: Virtuoso, Innovus; OpenROAD
Data/ML	PyTorch, TensorFlow, Torch-geometric, Tensorboard
Frameworks	Docker, SQLAlchemy, Airflow, Flask

Software Tools

- **EDA-schema [1]**: An open source physical design dataset for machine learning and a reference implementation of property graph datamodel schema developed to represent digital circuit designs and the associated attributes in the open dataset.  <https://github.com/drexel-ice/EDA-schema>

Awards and Certifications

- 2024 **Best Paper Award**, ACM Great Lakes Symposium on VLSI (GLSVLSI)
- 2014 **Winner**, Startup Weekend Kathmandu