# Sambhav Mattoo

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## Work Experience

- **Intel Corporation** *May 2023 – November 2024*
  **Software Engineer (EDA Tools/ CAD) – Test Chip Engineering** *Hillsboro, OR*
  - **Software Development:** Highly collaborative design and development of automation used for design of silicon devices based on cutting-edge semiconductor process nodes, including Intel 20A, 18A and upcoming 14A.
  - **Impact:** Delivered multiple projects with +10k L0C codebase with specs and documentation critical to next-gen chip and process development, used by 5+ design and process R&D teams at Intel. Recognized internally three times for high impact delivery by customers.
  - **High Performance Computing:** Development of frameworks for and conduction of massively parallel RC (Resistance/ Capacitance) extraction and simulations for silicon devices (LISP/ Python/ ICV).
  - **Impact:** Spearheaded creation of a framework that allowed silicon-based simulations for 10k+ test chip structures to complete in 2-6 hrs. instead of multiple weeks, with multiple levels of logging, error checking and instance termination.
  - **Impact:** Developed a new Python-based tool for finding simulation inaccuracies based on design rule violations and their distance from active transistors for thousands of test chip structures at scale.
  - **Team Player:** Worked in a highly multicultural team across geographies to deliver automation for next-gen processes. Helped with onboarding new engineers across multiple teams on various projects.
- **Apple Inc. (subcontracted)** *February 2023 - May 2023*
  **Senior Systems Engineer** *Remote*
  - Subcontracted to Apple Inc, creating scalable and secure Federated Learning frameworks used to train text-based generative models.
  - Machine Learning role involving data collection, data engineering, upstream processing for ML and network architecture design.
  - Developing web crawling scripts for finding and refining raw text data to train proprietary generative text-based models.

## Internships

- **Elucidata Corporation** *June 2020 - August 2020*
  **Data Science Intern** *Cambridge, MA / Delhi, India*
  - **Generalized Data Classification:** Developing and training a neural network on automated curation of genetic (GEO) databases.
  - **Ontology Tree Structures:** Collaborated in an 8-member team to automate the QC of the network's curations.
  - **Impact:** 700+ datasets (many relevant to COVID) were hosted on a web platform (Polly), used by clients from Yale, Pfizer, etc.
- **Wong lab, University of Missouri at St. Louis** *May 2019 - July 2019*
  **Research Scholar** *St. Louis, MO*
  - **High Performance Simulations:** Designed parallel simulations (C++, MPI) of bio-molecules implicated in heritable lung cancer, running on supercomputing clusters to visualize how mutations lead to cancer and to develop new drugs to target cancer cells.
  - **Unsupervised Learning:** Implemented a clustering algorithm (based on Daura et al.) to filter the simulated substructures by RMSD of distances to see how biomolecules behave without needing any imaging technology.
  - **Relational Database Design:** Started a database (SQLite) that can map genetic markers of lung cancer patients to the most effective treatment options.

## Recent Projects

- **TransformX – An AI driven change management ROI calculator (link)** *(Summer 2025)*
  - Creating a unique LLM finetuning pipeline in order to create specialized change consultant AI agents using Microsoft Azure AI foundry.
  - Implemented a data extraction layer to extract metrics and usable relations in change initiative from the agent and serving these insights with an innovative dashboard/UX.
  - Recognized by Microsoft as an impactful project with hosting costs covered for potential demos. Interest in investments from multiple VCs.
  - Technology used: Azure AI Foundry, python, node.js, react.js, BASH
- **Performance Degradation of Image Classifiers Using Image Transformation (link)** *(Summer 2022)*
  - Visualization study of pre-trained PyTorch image classifier's response to adversarial image datasets in order to create more robust image classifiers as well as an algorithmic framework for robust dataset augmentation.
  - Technology used: PyTorch, ImageNet, OpenCV, HyperOpt, GRAD CAM, occlusion heat-maps, TorchMetrics library

## Skills

- **Languages** : Python, PHP, HTML, CSS, Javascript, C, C++, Java, SQL, MATLAB, LaTeX, BASH, LISP, Cadence SKILL, Verilog
- **Frameworks** : Scikit, TensorFlow, Keras, PyTorch, OpenMP, MPI, CUDA, Hadoop, Apache Spark
- **Tools** : Kubernetes, Git, MySQL, MS SQL Server, NetBatch, Synopsys IC Validator, Cadence Virtuoso
- **Platforms** : Linux, Windows, Web3, AWS, MS Azure (Azure AI Foundry)

## Education

- **Georgia Institute of Technology** *(2021 - 2022)*
  - **Master of Science (MS) - Computer Science - Machine Learning Specialization**
  - Courses: Big Data, Artificial Intelligence, Machine Learning, Deep Learning, High Performance Computing, Graduate Algorithms
- **Indian Institute of Technology Kanpur** *(2016 - 2021)*
  - **Bachelors of Technology (B.Tech) - Scientific Computing and Bioengineering - Minor in Computer Systems**
  - Courses: Data Structures, Algorithms, Relational Databases, Computer Architecture, Scientific Computing, Computational Biology.