Abhishek Kumar Mishra

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I am seeking an internship opportunity in Semiconductor, Heath care domain, Data Science, and Machine Learning, where I can apply and hone the skills that I have acquired during my graduate study and work experience. As an intern, I would like to contribute to the company's productivity by solving problems using ML concepts.

EDUCATION

Drexel University, Ph.D. in Electrical & Computer Engineering (GPA – 4.0/4.0) Philadelphia, PA (Aug 2020 – Dec 2024)

University at Buffalo, MS in Computer Science (GPA – 3.51/4) Buffalo, NY (Aug 2018 – July 2020)

SKILLS

- Languages: **Python, C++, SQL, R** Tools/IDE**: Jupyter, Tableau, Anaconda, AWS, Google Cloud Platform**
- Libraries & Frameworks: **NumPy, Pandas, scikit-learn, Matplotlib, Tensorflow, Keras, Pytorch, Dash, Scipy, Plotly, SpaCy, NLTK, VADER, TextBlob, Gensim, Beautiful Soup, Regex, Bokeh, Folium, Hadoop, MapReduce, Spark**

WORK EXPERIENCE

Intel Corporation, MPE MDNA Team (Graduate Data Science Intern) Austin, TX, USA (Feb 2022 – July 2022)

- **Using parametric test data to minimize yield loss via Machine Learning:**
  - Worked on building **machine learning models** using **semiconductor test parametric data** to reduce **yield loss**. To do so, I worked on **screening anomalies** for server product data in an **unsupervised and supervised fashion** with **millions of skewed datasets** using different **machine learning models (LightGbM, CatBoost, XgBoost, RandomForest, MLP(6-layers), autoencoders).**
  - Created an end-to-end pipeline for **pulling the data, pre-processing, training, and predicting**.
  - Published my work in **VTS 2023.**

North Park Innovation Ltd (Research Intern) Buffalo, NY, USA (May 2019 – Dec 2019)

- **Finding the cause of malfunction of the HVAC system:**
  - Designed a pipeline for the multi-class classifier to find the cause of the malfunction of the HVAC system, where I performed various tasks like **data collection**, **data cleaning**, and **feature engineering**.
  - Developed an understanding of the HVAC domain and worked on the **multi-classification task** (22 labels), where I employed various classifiers (**Logistic Regression**, **Random Forest**, **SVM with linear kernel**, **ANN**, and **Ensemble**).
  - The ANN surpassed for malfunction detection, by a score of 81.35% macro precision & 80.21% macro-Recall with respect to rule-based client method.

Ericsson India Global Pvt. Ltd. (Junior Data Scientist) Mumbai, MH, India (Sep 2015 – Aug 2017)

- Around two years of work experience as a **Junior Data Scientist** in an **agile environment** with hands-on experience designing and implementing **Machine Learning Algorithms**.
- Predicted the network key performance indicator (**KPI**) for the client by developing a **classification model** based on the historical data for improvement and degradation of the network.
- **Anomaly detection** depending on the alarms to capture unusual site behavior of base stations, via a **supervised learning model**, significantly reduced the alarms by **30%**. The model will prevent the faults from happening through early predictions and proactive decisions.
- Employed a **Logistic regression model** to identify the cause of weak network connection by performing a **descriptive analysis** to gain insights into the dataset, and analyzing significant features that highly impact the target, and achieving a **10% more precise prediction** than the previous year.
- Created an **interactive Dashboards** and **visualization** for **descriptive analysis**.

Electrical and Computer Teaching Assistant Philadelphia, PA (Sep 2020 – Dec 2022)

- Held office hours and responsible for grading of homework, tests, and quizzes for courses: Introduction to Computer Organization (Fall 2020, Spring 2021, Fall 2022) and Digital Logic Design (Spring 2021)

Computer Science Teaching Assistant Buffalo, NY (Jan 2020 – Apr 2020)

- Held weekly recitation and office hours and responsible for grading of homework, tests, and quizzes for Introduction to Artificial Intelligence course (Spring 2020)

PUBLICATIONS

- **Predicting the Silent Data Error Prone Devices Using Machine Learning.** Mohammad Ershad Shaik**, Abhishek Kumar Mishra,** Yonghyun Kim (https://doi.org/10.1109/VTS56346.2023.10140097**) VTS 2023 (Worked during internship at Intel Corporation)**
- **Online Performance Monitoring of Neuromorphic Computing Systems. Abhishek Kumar Mishra**, Anup Das, Nagarajan Kandasamy (https://doi.org/10.1109/ETS56758.2023.10173860), **ETS 2023**
- **Hardware-Software Co-Design for On-chip Learning in AI Systems,** M.L.Varshika, **Abhishek Kumar Mishra**, Nagarajan Kandasamy, Anup Das (https://dl.acm.org/doi/10.1145/3566097.3568359) **ASPDAC 2023**
- **Built-In Functional Testing of Analog In-Memory Accelerators for Deep Neural Networks. Abhishek Kumar Mishra**, Anup Das, Nagarajan Kandasamy (https://doi.org/10.3390/electronics11162592) Proceedings of **Electronics 2022**
- **Does local pruning offer task-specific models to learn effectively? Abhishek Kumar Mishra***, Mohna Chakraborty* (https://aclanthology.org/2021.ranlp-srw.17) Proceedings of the Student Research Workshop Associated with **RANLP 2021**
- **GLUmos: Noninvasive Glucose Monitoring Using a Wearable Spectroscopy Device**
  Anush Niranjan, **Abhishek Kumar Mishra**, Amanda Watson, Tarek Hamid, Claire Kendell, Junpeng Zhao, Insup Lee, Nagarajan Kandasamy, submitted to **Ubicomp-ISWC 2024**
- **Drug Overdose Vital-Signs Evaluator using Machine Learning**.
  Anush Niranjan, **Abhishek Kumar Mishra**, Suman Kumar, David Gordon, Ayan Mandal, Jacob Brenner, Nagarajan Kandasamy, Amanda Watson, accepted to **IJCAI 2024**
- **WaferCap: Open Classification of Wafer Map Patterns using Deep Capsule Network**.
  Abhishek Kumar Mishra, Mohammad Ershad Shaik, Anush Lingamoorthy, Suman Kumar, Anup Das, Nagarajan Kandasamy, Nur A. Touba, accepted to **VTS 2024**
- **A Fully-Configurable Digital Spiking Neuromorphic Hardware Design with Variable Quantization and Mixed Precision**.
  Shadi Matinizadeh, Noah Pacik-Nelson, Ioannis Polykretis, Krupa Tishbi, Suman Kumar, M. L. Varshika, Arghavan Mohammadhassani, **Abhishek Kumar Mishra**, Nagarajan Kandasamy, James Shackleford, Eric Gallo, Anup Das, accepted to **MWSCAS 2024**

CURRENT RESEARCH PROJECTS

Finding abnormal behavior in crossbar arrays

- Executing a **DNN** involves a substantial amount of data transfer – **input-feature maps, synaptic weights, and matrix multiplication** results between the **off-chip memory and the processing cores**.
- Develop a **Machine Learning framework** to monitor the **correctness of a neuromorphic program's execution** using **model-based redundancy** in which a **software-based monitor** compares discrepancies between the **behavior of neurons mapped to hardware** and that **predicted by a corresponding machine learning model in real-time**.
- The approach will help to reduce the **additional hardware overhead** needed to support the **monitoring infrastructure** and **minimize intrusion** on the **executing applications**.

Early detection of opioid overdose using machine learning

- Conducting a study to collect opioid overdose from subjects.
- The study is being done under the approval of IRB.

AWARDS

Poster Presentation IBM IEEE CAS/EDS – AI Compute Symposium, Oct 2022.

- Selected to present the "IBM IEEE CAS/EDS – AI Compute Symposium 2022" poster. (https://www.zurich.ibm.com/thinklab/AIcomputesymposium.html)

REFERENCES

- **Dr. Anup Das –** Associate Professor (Advisor), Drexel University. Email: ad3639@drexel.edu
- **Dr. Nagarajan Kandasamy –** Professor (Co-advisor), Drexel University. Email: nk78@drexel.edu