Koushani Chakrabarty

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Education

- **University at Buffalo, The State University of New York** — Buffalo, NY
  Masters in Computer Science — *Aug 2022 - December 2023*
  Courses: Computer Architecture, Analysis Of Algorithms, Deep Learning, Machine Learning, Reinforcement learning.
- **University at Buffalo, The State University of New York** — Buffalo, NY
  Masters in Electrical Engineering — *January 2019 - June 2020*
  Courses: Consumer Optoelectronics, Probability and Statistics, Deep Learning, Machine Learning, Machine Learning in Wireless Communications.
- **West Bengal University of Technology** — Kolkata, West Bengal, India
  Bachelor of Technology in Electronics and Communications Engineering; — *Aug 2011 - May 2015*

Experience

- **SAIR LAB, UNIVERSITY OF BUFFALO** — Buffalo, NY
  Research Intern — *June 2023 - Present*
  - Conducted research pertaining to Swarm Reinforcement Learning in quadcoptor swarms in a simulated environment.
  - Applied research to reduce computational overhead by 30% in a Payload Delivery System using swarm of UAVs.
- **TATA INSTITUTE OF FUNDAMENTAL RESEARCH, INDIA ; CERN, GENEVA, SWITZERLAND**
  Computational Physics Intern — *March 2021 - Ma*
  - Assisted in parallelizing the Track Reconstruction Algorithm used by the Large Hadron Collider II (LHC) using Nvidia-Tesla GPUs clusters and CUDA.
  - Leveraged said parallelization to speed up the study of proton-proton collisions for Allen, a pioneering high-throughput GPU trigger for High Energy Physics by 43%
- **UNIVERSITY OF BUFFALO** — Buffalo, NY
  Algorithms Intern — *July 2020 - December 2021*
  - Evaluated efficiency and speed of three niche Bayesian Network Structure Learning Algorithms.
  - Utilized the collected evaluations to compare said Algorithms with SOTA (State of the Art) techniques used in learning the structure of Bayesian Networks.
- **TATA CONSULTANCY SERVICES** — Chennai, India
  Assistant Systems Engineer in Telecommunications Software Development — *July 2015 - July 2017*
  - Developed a resource tracking application, optimizing multi-location resource management using Java, JDBC, and SQL.
  - Harnessed the application to improve customer management and resource management for client by 25% .

Academic Experience

- **Spatial AI & Robotics Lab** — Buffalo, NY
  Graduate Research Assistant — *Dr.Chen Wang — June 2023 - Present*
  - Formulated an auxiliary reward function for payload delivery using Reinforcement Learning in a swarm of UAVs.
  - Enhanced the computational efficiency of Path Planning Algorithm in Payload Delivery System by 35% by replacing Optimal Control with Reinforcement Learning.
- **University at Buffalo, The State University of New York** — Buffalo, NY
  Projects — *Aug 2022 - Present*
  - Developed a Large Language Model using Open AI's Transformers to aid in Reinforcement Learning Research
  - Experimented with reinforcement learning methods, leveraging PyTorch across various environments.
  - Developed an experiment to compare vanilla Behavioral Cloning and Behavioraly Cloned Reinforced Learning.
  - Created a Game Rating Application by applying NLP on an Amazon Reviews Dataset.

Skills Summary

- **Languages**: Python, C++, Java, R, SQL.
- **Tools**: Databricks, Jupyter Notebook, Apache Spark, S3, Athena/Trino, GenAI tools (e.g., Langchain, LlamaIndex), Vector DBs, MLOps platforms (Kubeflow, MLFlow), Kubernetes, Docker, GIT, JIRA, Apache Kafka, Postman, Agile, Tableau, PySpark, Postgres, Django.
- **Deep Learning**: PyTorch, TensorFlow, Caffe, OpenCV, QT, OpenGL, Generative AI techniques, Federated Learning, Computer Vision, LLM, Reinforcement Learning, ONNX, Flask, Django, Tensorrt, Triton Inference Server, Deepstream, CUDA.
- **Cloud Platforms**: AWS, GCP, and Azure.