Abbaas Alif Mohamed Nishar

470-601-4788 | amohamednishar1@student.gsu.edu | LinkedIn | Github | Google Scholar | Website

Education

Doctor of Philosophy - Computer Science — Atlanta, GA
Georgia State University — *Aug 2022 – May 2025*

Master of Science - Computer Science — Atlanta, GA
Georgia State University — *Aug 2021 – May 2022*

Bachelors in Technology - Electronics and Communications — Chennai, Tamil Nadu, India
Vellore Institure of Technology — *Aug. 2016 – May 2020*

Technical Skills

Languages:C, C++, Java, Python, Javascript, Go, R, HTML/CSS, SQL, MATLAB
Frameworks: Django, Flask, CUDA C, Sikuli, Power BI, Tableau,
Developer Tools: Git, Docker, Kubernetes, TravisCI, Jenkins, Google Cloud Platform, AWS, Azure, Mongo DB, Raspberry Pi, Arduino, Azure IoT Hub, Redis Cache, MQTT, Wireshark, JupyterLab, Terraform, Copilot
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn, scipy, tensorflow, Pytorch, JAX, Numba, OpenCV, GluonTS, MxNet, Prophet, Celery, Pytest, Plotly, Dash, Optuna, Ray Tune, sktime, seaborn, openai

Experience

Applied Scientist — June 2025 – Present
Capital One – AI Foundations — *San Jose, CA*

- Developing LLM-powered personalization and agentic workflow systems for Eno, Capital One's conversational banking chatbot.
- Built RAG-enhanced intent classification system (EIC) using GPT-OSS 120B and 20B (with speculative decoding), optimizing conversation history integration to improve accuracy from 75% to target 83%+ performance.
- Engineered automated pain point discovery pipeline analyzing thousands of customer conversations, identifying specific failure patterns and actionable insights for chatbot improvement.
- Updated Recommender Systems with Econometric Features and Created DataLens – a Feature/Model drift detector for the APEX recommender and Creditwise Recommender.

Founding Engineer — July 2023 – June 2025
Revelio Communications Inc. — *Atlanta, GA*

- Building interactive Television experience with mobile phones. https://www.revelio.ai/
- Optimization of the encoding pipeline and achieved a speed-up of 100× using GPU optimizations.
- Developed a neural network-based multi-stage decoder for mobile phones, enhancing decodability by 60%.

Graduate Research Assistant — Aug 2021 – June 2025
Georgia State University — *Atlanta, GA*

- Joint sensing and communication using Optical Wireless and Neuromorphic Cameras
- Improving Imperceptibility of Flicker fusion based Encoding of Meta Information in Videos
- Data ingestion and visualization pipeline for multiple projects for asynchronous IoT communication.
- Prediction of micro-climate using Muon particle flux using ground-based fixed and mobile detectors.
- Underground radon flux data analytics and creating predictive time-series models for Radon Flux. http://tinyurl.com/radon-wsb2
- AI/ML in Network Traffic Classification
- LLM in Network Simulations.
- Data Agnostic Image Annotation using Optical Tags. https://slideslive.com/38971914

Data Science Intern — May 2022 – Aug 2022
American Family Insurance — *Remote*

- Worked on image segmentation models that aid for underwriting in home inspection.
- Optimized codebases by reducing size by 80% and implemented automated multi-GPU training.

DevOps Engineer — Aug 2020 – Aug 2021
Tata Consultancy Services — *Chennai, Tamil Nadu, India*

- Improved forecasting accuracy by 25% using Time Series and ML models for a leading retailer in UK.
- Power BI dashboards and Power Apps for WMS team, achieving 100% visibility and 60% scanning accuracy.
- CI/CD pipelines for JDA WMS with Postgres SQL with Jenkins, reducing deployment time by 50%.

Research Intern Dec 2019 – Jun 2020

Tata Consultancy Services *Chennai, Tamil Nadu, India*

- Developed AR/VR app for clothing pattern detection using object detection.
- Created a PoseNet-based surveillance system.
- Built text-to-avatar interface using HapFacs4.0.

Projects

NP_Complete_Solver_LLM | *Python, Flask, OR-Tools, OpenAI GPT-4* 02/14/2025

- Developed an iterative solver that leverages GPT-4 and OR-Tools to address NP-complete problems
- Implemented a chain-of-thought prompting mechanism with an agentic feedback loop to iteratively refine solutions with optimal results.
- Project available at: https://github.com/abbaasalif/NP-complete-solver-LLM

freematch-improved | *Python, PyTorch* 04/23/2024

- Improved the FreeMatch self-adaptive thresholding technique for semi-supervised learning.
- Reproduced and validated experiments from the original paper, enhancing the implementation with custom modifications.
- Documented the modifications and provided a step-by-step guide for replicating the results.
- Project available at: https://github.com/abbaasalif/freematch-improved

hAIrmony | *Python, Image segmentation, DALL-E 2* 11/19/2023

- A real-time AI based hair style recommendation system.
- We integrated a hair segmentation model using roboflow API.
- Then we use the DALL-E 2's inpainting to create descriptive prompts to suggest the user how a particular hairstyle will look on them.
- Project available at: https://github.com/abbaasalif/hAIrmony

Faces generation using Generative Adversarial Networks | *Python, Tensorflow, DCGAN* 07/20/2022

- This project is about gerneation of human faces using adversarial networks.
- Implemented a DCGAN using Wassertain GAN loss function.
- Added improvements like regularization, training with adam and other GAN hacks to prevent weight explosion and stabilize training.
- Project available at: https://github.com/abbaasalif/gans_task_faces

YOLO_custom | *Python, TensorFlow, OpenCV* 12/05/2020

- Trained a custom YOLO model for ambulance detection using web-scraped and self-annotated images.
- Fine-tuned the model for improved accuracy and performance on specific detection tasks.
- Provided detailed documentation and code for training and evaluating the model.
- Attempting to create a pytorch version of YOLO models from cfg files of darknet.
- Project available at: https://github.com/abbaasalif/YOLO_custom

vanilla_policy_gradients | *Python, TensorFlow, OpenAI Gym* 03/01/2021

- Implemented vanilla policy gradients using TensorFlow 1 API and OpenAI Gym Cartpole.
- Demonstrated foundational understanding of reinforcement learning algorithms and practical implementation.
- Included detailed code and explanations for the reinforcement learning process and results.
- Project available at: https://github.com/abbaasalif/vanilla_policy_gradients

q_learning | *Python, NumPy* 02/20/2021

- Developed a Q-learning algorithm to optimize warehouse flows.
- Applied reinforcement learning techniques to real-world logistics problems of managing warehouse flows as a graph representation.
- Provided detailed documentation and code for replicating the optimization process.
- Project available at: https://github.com/abbaasalif/q_learning

cost_minimization_Deep_Q_learning | *Python, TensorFlow, Keras* 02/25/2021

- Used deep Q-learning to minimize cooling energy consumption.
- Applied ML to optimize energy efficiency, showcasing practical and impactful applications.
- Provided comprehensive documentation and code for implementing the deep Q-learning algorithm.
- Project available at: https://github.com/abbaasalif/cost_minimization_Deep_Q_learning

Generative_adversarial_networks_tf1 | *Python, TensorFlow* 03/03/2021

- Implemented GANs using TensorFlow for tasks such as image generation.
- Showcased advanced neural network architectures and their applications in data augmentation and generation.
- Provided detailed documentation and examples for training and evaluating GANs.
- Project available at: https://github.com/abbaasalif/Generative_adversarial_networks_tf1

Transformers for Translation | *Python, Tensorflow, Keras, Numpy* 02/02/2021

- Developed a Transformer-based model for machine translation, showcasing a practical implementation of the "Attention Is All You Need" architecture from scratch in Tensorflow and Keras.
- Demonstrated the model's effectiveness in translating languages through Jupyter Notebooks, providing a hands-on learning experience. The data is taken from open source French to English translation and also demonstrated how to remove stop words from a large corpus.
- Contributed to the open-source community by sharing a simplified version of the Transformer model, enabling enthusiasts and researchers to explore and understand deep learning translation techniques. https://github.com/abbaasalif/transformers_for_translation

Publications - Conference Papers

Stress Tests REVEAL Fragile Temporal and Visual Grounding in Video-Language Models
Under Review at CVPR 2026

ART: Adaptive Reasoning Trees for Explainable Claim Verification
Accepted at EACL 2026

Revelio: A Real-World Screen-Camera Communication System with Visually Imperceptible Data Embedding
Accepted at IEEE ICASSP 2025, Oral presentation third position at GSU Graduate Research Conference

Text2Net: Transforming Plain-text To A Dynamic Interactive Network Simulation Environment
Accepted at IEEE SouthEastCon 2025

Non Line-of-Sight Optical Wireless Communication using Neuromorphic Cameras
Accepted at ACM EWSN 2025

Toward modeling underground soil radon gas emanation
Accepted at IEEE SouthEastCon 2024, Presented at GSU Research Conference 2023

A Framework for Classifying Applications from Raw Network Traffic Traces
Accepted at IEEE SouthEastCon 2024, Best Student Paper Award at IEEE SoutEastCon , Presented at GSU Research Conference 2023

Posters, Workshop papers and demos

Workshop: DeLiDAR: Decoupling LiDARs for Pervasive Spatial Computing
Proceedings of EWSN 2024 Workshop

Poster: Joint Optical Wireless Communication and Sensing using Neuromorphic Cameras
Best Poster Award 3^{rd} place , Proceedings of ACM/IEEE CPS IoT Week (IPSN)

Poster: Text2Net: Transforming Plain Text into Dynamic, Interactive Network Simulations
Proceedings of ACM/IEEE CPS IoT Week (IPSN)

Talk:Monitoring Solar Effect with CubeSats on Cosmic Ray Flux Variation at Sea Levels
Proceedings of Cubesat Developers Workshop 2023

Poster: Field-to-Cloud IoT System using GSU ARCTIC Virtual Machines
Proceedings of Scientific Computing Day 2023

Poster: OpenRadon Lab: Democratizing Soil Radon Modeling and Mapping
Proceedings of ACM MobiSys 2022, Scientific Computing Day 2022, AARST Symposium 2022

Workshop: Data Agnostic Image Annotations
Proceedings of NeurIPS DCAI 2021

Patents

MACHINE LEARNING BASED SYSTEM AND METHOD FOR CONTROLLING RESIDUAL ARTIFACTS IN MEDIA CONTENTS TO OPTIMIZE USER EXPERIENCE IN REAL-TIME SCREEN-TO-CAMERA COMMUNICATION ENVIRONMENT

United States Patent Application 20250030811

Service

President - IEEE@GSU Student Chapter 06/15/2024 - Present

- Organized IdEEEathon 2024 - an ideathon event in collaboration with IEEE Atlanta Section, IEEE Young Professionals
- Raspberry Pi Workshop - Conducted an workshop on Raspberry Pi in collaboration with Girls Who Code @ GSU.

Guest Lectures

- CSC 4120/6120 - Intro to Robotics - 2023, 2024
- CSC 8830 - Advanced Computer Vision - 2023, 2024

AIforGoodSimulator 2020-2022

- The Simulator is a web tool for NGOs and local authorities to model COVID-19 outbreak inside refugee camps and prepare timely and proportionate response measures needed to flatten the curve and reduce the number of fatalities.
- Helped in building the backend for the webapp and wrote test cases for the epidemiology app.