

# Abbaas Alif Mohamed Nishar

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## EDUCATION

<b>Doctor of Philosophy - Computer Science</b> <i>Georgia State University</i>	Atlanta, GA Aug 2022 – May 2025
<b>Master of Science - Computer Science</b> <i>Georgia State University</i>	Atlanta, GA Aug 2021 – May 2022
<b>Bachelors in Technology - Electronics and Communications</b> <i>Vellore Institute of Technology</i>	Chennai, Tamil Nadu, India 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

<b>Founding Engineer</b> <i>Revelio Communications Inc.</i>	July 2023 – Present Atlanta, GA
<ul style="list-style-type: none"><li>Building interactive Television experience with mobile phones. <a href="https://www.revelio.ai/">https://www.revelio.ai/</a></li><li>Optimization of the encoding pipeline and achieved a speed-up of 100× using GPU optimizations.</li><li>Developed a neural network-based multi-stage decoder for mobile phones, enhancing decodability by 60%.</li></ul>	
<b>Graduate Research Assistant</b> <i>Georgia State University</i>	Aug 2021 – Present Atlanta, GA
<ul style="list-style-type: none"><li>Joint sensing and communication using Optical Wireless and Neuromorphic Cameras</li><li>Improving Imperceptibility of Flicker fusion based Encoding of Meta Information in Videos</li><li>Data ingestion and visualization pipeline for multiple projects for asynchronous IoT communication.</li><li>Prediction of micro-climate using Muon particle flux using ground-based fixed and mobile detectors.</li><li>Underground radon flux data analytics and creating predictive time-series models for Radon Flux. <a href="http://tinyurl.com/radon-wsb2">http://tinyurl.com/radon-wsb2</a></li><li>AI/ML in Network Traffic Classification</li><li>LLM in Network Simulations.</li><li>Data Agnostic Image Annotation using Optical Tags. <a href="https://slideslive.com/38971914">https://slideslive.com/38971914</a></li></ul>	
<b>Data Science Intern</b> <i>American Family Insurance</i>	May 2022 – Aug 2022 Remote
<ul style="list-style-type: none"><li>Worked on image segmentation models that aid for underwriting in home inspection.</li><li>Optimized codebases by reducing size by 80% and implemented automated multi-GPU training.</li></ul>	
<b>DevOps Engineer</b> <i>Tata Consultancy Services</i>	Aug 2020 – Aug 2021 Chennai, Tamil Nadu, India
<ul style="list-style-type: none"><li>Improved forecasting accuracy by 25% using Time Series and ML models for a leading retailer in UK.</li><li>Power BI dashboards and Power Apps for WMS team, achieving 100% visibility and 60% scanning accuracy.</li><li>CI/CD pipelines for JDA WMS with Postgres SQL with Jenkins, reducing deployment time by 50%.</li></ul>	
<b>Research Intern</b> <i>Tata Consultancy Services</i>	Dec 2019 – Jun 2020 Chennai, Tamil Nadu, India
<ul style="list-style-type: none"><li>Developed AR/VR app for clothing pattern detection using object detection.</li><li>Created a PoseNet-based surveillance system.</li><li>Built text-to-avatar interface using HapFacs4.0.</li></ul>	

## PROJECTS

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<b>NP_Complete_Solver_LLM</b>   <i>Python, Flask, OR-Tools, OpenAI GPT-4</i>	02/14/2025
<ul style="list-style-type: none"><li>Developed an iterative solver that leverages GPT-4 and OR-Tools to address NP-complete problems</li><li>Implemented a chain-of-thought prompting mechanism with an agentic feedback loop to iteratively refine solutions with optimal results.</li><li>Project available at: <a href="https://github.com/abbaasalif/NP-complete-solver-LLM">https://github.com/abbaasalif/NP-complete-solver-LLM</a></li></ul>	
<b>freematch-improved</b>   <i>Python, PyTorch</i>	04/23/2024
<ul style="list-style-type: none"><li>Improved the FreeMatch self-adaptive thresholding technique for semi-supervised learning.</li><li>Reproduced and validated experiments from the original paper, enhancing the implementation with custom modifications.</li><li>Documented the modifications and provided a step-by-step guide for replicating the results.</li><li>Project available at: <a href="https://github.com/abbaasalif/freematch-improved">https://github.com/abbaasalif/freematch-improved</a></li></ul>	
<b>hAIrmony</b>   <i>Python, Image segmentation, DALL-E 2</i>	11/19/2023
<ul style="list-style-type: none"><li>A real-time AI based hair style recommendation system.</li><li>We integrated a hair segmentation model using roboflow API.</li><li>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.</li><li>Project available at: <a href="https://github.com/abbaasalif/hAIrmony">https://github.com/abbaasalif/hAIrmony</a></li></ul>	
<b>Faces generation using Generative Adversarial Networks</b>   <i>Python, Tensorflow, DCGAN</i>	07/20/2022
<ul style="list-style-type: none"><li>This project is about generation of human faces using adversarial networks.</li><li>Implemented a DCGAN using Wassertain GAN loss function.</li><li>Added improvements like regularization, training with adam and other GAN hacks to prevent weight explosion and stabilize training.</li><li>Project available at: <a href="https://github.com/abbaasalif/gans_task_faces">https://github.com/abbaasalif/gans_task_faces</a></li></ul>	
<b>YOLO_custom</b>   <i>Python, TensorFlow, OpenCV</i>	12/05/2020
<ul style="list-style-type: none"><li>Trained a custom YOLO model for ambulance detection using web-scraped and self-annotated images.</li><li>Fine-tuned the model for improved accuracy and performance on specific detection tasks.</li><li>Provided detailed documentation and code for training and evaluating the model.</li><li>Attempting to create a pytorch version of YOLO models from cfg files of darknet.</li><li>Project available at: <a href="https://github.com/abbaasalif/YOLO_custom">https://github.com/abbaasalif/YOLO_custom</a></li></ul>	
<b>vanilla_policy_gradients</b>   <i>Python, TensorFlow, OpenAI Gym</i>	03/01/2021
<ul style="list-style-type: none"><li>Implemented vanilla policy gradients using TensorFlow 1 API and OpenAI Gym Cartpole.</li><li>Demonstrated foundational understanding of reinforcement learning algorithms and practical implementation.</li><li>Included detailed code and explanations for the reinforcement learning process and results.</li><li>Project available at: <a href="https://github.com/abbaasalif/vanilla_policy_gradients">https://github.com/abbaasalif/vanilla_policy_gradients</a></li></ul>	
<b>q_learning</b>   <i>Python, NumPy</i>	02/20/2021
<ul style="list-style-type: none"><li>Developed a Q-learning algorithm to optimize warehouse flows.</li><li>Applied reinforcement learning techniques to real-world logistics problems of managing warehouse flows as a graph representation.</li><li>Provided detailed documentation and code for replicating the optimization process.</li><li>Project available at: <a href="https://github.com/abbaasalif/q_learning">https://github.com/abbaasalif/q_learning</a></li></ul>	
<b>cost_minimization_Deep_Q_learning</b>   <i>Python, TensorFlow, Keras</i>	02/25/2021
<ul style="list-style-type: none"><li>Used deep Q-learning to minimize cooling energy consumption.</li><li>Applied ML to optimize energy efficiency, showcasing practical and impactful applications.</li><li>Provided comprehensive documentation and code for implementing the deep Q-learning algorithm.</li><li>Project available at: <a href="https://github.com/abbaasalif/cost_minimization_Deep_Q_learning">https://github.com/abbaasalif/cost_minimization_Deep_Q_learning</a></li></ul>	
<b>Generative_adversarial_networks_tf1</b>   <i>Python, TensorFlow</i>	03/03/2021
<ul style="list-style-type: none"><li>Implemented GANs using TensorFlow for tasks such as image generation.</li><li>Showcased advanced neural network architectures and their applications in data augmentation and generation.</li></ul>	

- Provided detailed documentation and examples for training and evaluating GANs.
- Project available at: [https://github.com/abbaasalif/Generative\\_adversarial\\_networks\\_tf1](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/transfomers\\_for\\_translation](https://github.com/abbaasalif/transfomers_for_translation)

## PUBLICATIONS - CONFERENCE PAPERS

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### Cut! Where Video-Language Models Fall Apart

To be submitted to 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

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### 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<sup>rd</sup> 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

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### 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

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### **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 a 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.