

# Abbaas Alif Mohamed Nishar

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## EDUCATION

### Doctor of Philosophy and Master of Science - Computer Science

Georgia State University

Atlanta, GA

Aug 2021 – Present

### Bachelors in Technology - Electronics and Communications

Vellore Institute of Technology

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, GlueTS, MxNet, Prophet, Celery, Pytest, Plotly, Dash, Optuna, Ray Tune, sktime, seaborn, openai

## EXPERIENCE

### Founding Engineer

Revelio Communications Inc.

July 2023 – Present

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

Georgia State University

Aug 2021 – Present

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

American Family Insurance

May 2022 – Aug 2022

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

Tata Consultancy Services

Aug 2020 – Aug 2021

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

Tata Consultancy Services

Dec 2019 – Jun 2020

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.

- 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](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](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](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](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](https://github.com/abbaasalif/cost_minimization_Deep_Q_learning)
- Generative\_adversarial\_networks\_tfl** | *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](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](https://github.com/abbaasalif/transformers_for_translation)

## **PUBLICATIONS - CONFERENCE PAPERS**

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### **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

### **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

### **Backscatter Optical Wireless Communication using Neuromorphic Cameras**

Accepted at ACM EWSN 2025

## **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

## **VOLUNTEERING**

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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 an workshop on Raspberry Pi in collaboration with Girls Who Code @ GSU.