AIZAZ SHARIF Ph.D. Research Fellow

A goal-oriented computer scientist and researcher with over 7 years of background and practical experience in AI, deep learning, and software engineering.

CONTACT

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SKILLS

Programming Languages Python Bash C, C++ Go Java HTML, CSS, Javascript	
ML engineering Containerization (Docker) Data Versioning	•••••
ML Lifecycle Management (ML flow) Experiment Tracking (Weights & Biases) Cloud Computing (AWS, Ray)	

Data Science

Statistical Modeling (Bayesian Statistics, Probability Theory, Causal Inference) Visualisation Tools (Matplotlib, Seaborn, Plotly, PowerBI) Data handling/analysis (Numpy, Scipy, Pandas) **ML** libraries (Tensorflow, Keras, PyTorch, Ray RLlib, OpenAl Gym) Databases (MySQL, SQLite, PostgreSQL)

PERSONAL SKILLS

Problem Solving **Effective Communication** Team player Detailed-oriented

WORK EXPERIENCE

- 🛗 02/2024 Present
- ♀ CogniMindAI, Remote
- Machine Learning Engineer • Working with a startup to build an end-to-end LLM architecture.
- Creating an ML engine for custom LLM ingestion and inferences for business-specific use cases on various databases.

1 02/2020 - 03/2024

- Simula Research Laboratory, Norway
- Thesis title: Testing the Safety and Robustness of Autonomous Cars in a Multi-agent Environment
- Worked as a Ph.D. Researcher in the 'Department of Validation Intelligence for Autonomous Software Systems'.
- Proposed novel scientific contributions in the fields of adversarial reinforcement learning, systematic benchmarking, and reward modeling for testing decentralized multi-agent autonomous driving systems.
- · Created an open-source platform for testing multi-agent autonomous driving systems.
- Gained experience in simulated driving environments, reinforcement learning, and testing of autonomous cars policies.

02/2019 - 01/2020

- **Research Associate** ♥ National Center for Cyber Security (NCCS), Pakistan
- Lead a small team of software developers for the 'Mobile Phone Digital Forensics' toolkit.
- Implemented a Python-based Flask backend for REST API calls of the user interface and SQLite for Android device databases.
- Constructed a Web application for the acquisition, analysis, and reporting of Android devices for criminal investigation.
- Maintained a software workflow that was released to the authorities for beta testing.

09/2017 - 02/2019

- ♥ FAST NUCES, Pakistan
- Worked under 'Colab' Research group for the campus.
- Participated in research areas related to Generative Models, Natural Language Processing, Android Malware Detection, Graphic Theory, Bioinformatics, and Medical Imaging.
- Implemented, wrote, and published a journal article 'Android malware detection through generative adversarial networks'.

🛗 04/2017 - 06/2017

Q DCUBE Technologies, Pakistan

- Worked under the 'Product Innovation and Strategy' team.
- Integrated state-of-the-art OCR libraries in 1 month to an ongoing C++ based large-scale library for live deployment.
- Increased the accuracy of the OCR prediction by 10% along with performance optimization.
- Gained skills in OCR Pipeline, Python Linux Shell Scripting, Computer Vision, and Deep Learning.

10/2016 - 04/2017

Q Techlogix, Pakistan

- Worked as a Software Engineer for the implementation and support of FLEXCUBE which is Oracle's Universal Banking Solution.
- Implemented a workflow using PL/SQL for a smooth migration process from the old to the proposed Oracle Solution under strict deadlines.
- Provided continuous support to the migrated system for easily running daily ongoing transactions.

EDUCATION

02/2020 - 08/2023 • University of Oslo, Norway 🛗 08/2017 - 07/2019 FAST NUCES, Pakistan CGPA: 3.61/4.0

08/2012 - 07/2016 **9** FAST NUCES, Pakistan CGPA: 3.84/4.0

Ph.D. Computer Science

M.Sc. Computer Science

B.Sc. Computer Science



Research Assistant

Ph.D. Research Fellow

- Software Engineer

Software Engineer

HONORS & ACHIEVEMENTS

- CANDAR Outstanding Paper at the CANDAR Conference, Japan (2019)
- 1x Bronze Medal in M.Sc. Computer Science (2019)
- 7x Gold Medal and 1x Silver Medal in B.Sc. Computer Science (2012-2016)

RESEARCH INTERESTS

- Testing Autonomous Cars
- Reinforcement Learning
- Causal Bayesian Networks
- Uncertainty Quantification
- Large Language Models
- Generative Models

REFERENCES

References will be provided upon request.

NOTABLE PROJECTS

Industrial Projects

- End-to-end LLM Application: I am working on building an end-to-end LLM application for several internal use cases. The tasks so far involve data collection and transformation into vector databases, as well as setting up an LLM backend for inference.
- Mobile Forensics Software: During my employment at NCCS, I worked as a research associate to lead the project and develop a web application for the acquisition, analysis, and reporting of Android devices for criminal investigation. I actively worked on implementing a Python-based Flask backend for REST API calls of the user interface and SQLite for Android device databases. The software was released for beta testing to the authorities.
- OCR Library: During my job at DCUBE startup, I worked on integrating stateof-the-art OCR libraries in 1 month into an ongoing C++ based large-scale library. The end goal was to capture accurate information from unstructured invoices from the past. It was part of an Android application that is being prepared for live deployment and demos for US-based clients such as Amazon and Pitney Bowes. I increased the accuracy of the OCR prediction by 10% along with performance optimization.
- FLEXCUBE Banking Software: During my job at Techlogix, I worked on the implementation and support of FLEXCUBE, which is Oracle's Universal Banking Solution. I was primarily involved in implementing a workflow using PL/SQL for a smooth migration process to the proposed Oracle solution under strict deadlines. I also provided continuous support to the migrated system to HBL Microfinance Bank to run daily ongoing transactions with ease.
- Smartphone Based Human Activity Surveillance System: This is my Bachelor's degree project in the last year of my degree. I created an Android application that can recognize, record, and visualize basic human physical activities in real time. This was achieved by implementing ML algorithms on custom-collected datasets.

Research Projects

• ReMAV: Reward Modeling of Autonomous Vehicles for Finding Likely Failure Events

<u>GitHub Link</u> | Paper in submission

Targeted domains: Inverse Reinforcement Learning, Behavior Modeling, Testing Autonomous Vehicles

• Evaluating the Robustness of Deep Reinforcement Learning for Autonomous Policies in a Multi-agent Urban Driving Environment <u>GitHub Link</u> | Paper Published

Targeted domains: Deep Reinforcement Learning, Systematic Benchmarking, Testing Autonomous Vehicles

 Adversarial Deep Reinforcement Learning for Improving the Robustness of Multi-agent Autonomous Driving Policies GitHub Link | Paper Published

Targeted domains: Deep Reinforcement Learning, Adversarial Testing, Autonomous Vehicles

• DeepOrder: Deep Learning for Test Case Prioritization in Continuous Integration Testing

<u>GitHub Link</u> | Paper Published

Targeted domains: Regression testing, Test case Prioritization, Deep Learning, Continuous Integration

Android Malware Detection through Generative Adversarial Networks
Paper Published

Targeted domains: Malware Detection, Binary Analysis, Generative Adversarial Networks

• Function Identification in Android Binaries Using Deep Learning Paper Published

Targeted domains: Function Identification, Malware Detection, Binary Analysis, Convolutional Neural Networks