# Abdur Rouf

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GitHub | Leetcode | LinkedIn | Google Scholar
*U.S. Permanent Resident (Authorized to work in the U.S.)*

## EDUCATION

**Ph.D. Computer Engineering**, University of Central Florida **CGPA: 4.00/4.00** Jan 2025 – (Expected)April 2027
**M.Sc. Computer Science & Eng.**, University of Nevada, Reno **CGPA: 4.00/4.00** Dec 2024
**B.Sc. Computer Science & Eng.**, Bangladesh University of Eng. & Tech. **CGPA: 3.33/4.00** Feb 2021

## EXPERIENCE

**Research Assistant, University of Central Florida** Jan 2025 – Present

- Developed a **DQN**-based online learning framework for SDN flow placement using Ryu controller and Redis as a shared-memory layer to track per-flow metadata (hit rate, last-hit timestamp). Integrated with our published flow-eviction strategy that **outperforms LRU and LFU by 7–8% hit rate**, enabling more efficient cache utilization.
- Built a fault-tolerant job distributor capable of managing **millions of compute-heavy jobs**, orchestrating workloads across heterogeneous machines (HPC, HTC, desktops, laptops, mixed OS) with node-failure handling, retries, and dynamic load balancing, reducing overall runtime **from weeks/months to days**.

**Research Assistant, University of Nevada, Reno** Jan 2023 – Dec 2024

- Developed Edge-AI wildfire detection system (Jetson, YOLOv8), reducing **latency 70%, bandwidth 51%**.
- Implemented ML algorithms for network traffic fingerprinting, improving **accuracy by 12%**.

**Software Engineer, REVE Systems** May 2021 – Dec 2022

- Built asynchronous Java microservices, reducing chat archive processing from **30 days to 15 minutes**.
- Integrated Facebook Messenger, WhatsApp APIs and improved chatbot response by **200%**.
- Redesigned onboarding using React and Spring Boot, significantly boosting user engagement by **50%**.

## TECHNICAL SKILLS

**Languages:** C++, C, Java, Python, JavaScript, C#, Go, PHP, Bash, MATLAB
**Frameworks:** Spring Boot, React.js, Node.js, ROS, JQuery, Express.js, Flask, Fast API, Ryu, ONOS (SDN Controller)
**Libraries:** Pandas, NumPy, TensorFlow, PyTorch, Keras, Torchvision, Scikit-learn
**Cloud/HPC/HTC:** AWS, Chameleon, Linode, UCF HPC Cluster, OSPool (HTC), HTCondor
**DevOps Tools:** Docker, Kubernetes, Ansible, FRP, Jenkins, Git, GitHub, GitLab, Bitbucket
**Testing Tools:** Swagger, Postman, Selenium, JMeter, JUnit
**Databases/Cache:** MySQL, PostgreSQL, MongoDB, Redis, OracleDB, RabbitMQ
**Protocols:** REST APIs, gRPC, WebSocket, Webhook, SOAP, Redis Pub/Sub, OpenFlow (SDN)
**Operating Systems:** Linux, Unix, MacOS, Windows, Jetpack, Raspbian

## PROJECTS

**Job Distributor** [GitHub]: Open-source framework for orchestrating large-scale parameter sweeps, distributing jobs across heterogeneous machines (HPC clusters, desktops, laptops, cloud VMs) with fault tolerance, and scalability.
**JDK Dependencies Graph Generator** [GitHub]: Static analysis tool that parses JDK libraries to generate class/package dependency graphs, essential to understanding the critical area of the codebase.
**Ext2 File System (C)** [GitHub]: Custom Linux-style file system with inode/block allocation, file/directory operations, and visualization utilities for exploring OS-level storage internals.
**CNN Natural Disaster Classifier** [GitHub]: ResNet-based image classification pipeline with data augmentation and hyperparameter tuning, achieving 95% accuracy in disaster type prediction.
**Dynamic Memory Allocator (C)** [GitHub]: Custom heap allocator using `sbrk`/`brk` system calls, supporting malloc/free-like operations with first-fit placement, block splitting, and coalescing.
**Autonomous Mobile Manipulation (ROS)** [GitHub] [Youtube Video]: Simulated robot arm and mobile base in ROS, autonomously planning and executing sanding tasks using perception, motion planning, and trajectory control.

## SELECTED PUBLICATIONS

[1] Spatial Encoding of Flow Spaces for Intelligent SDN Applications, **Abdur Rouf** and Murat Yuksel, IEEE NFV-SDN 2025. (Accepted)
[2] **DART:** Distributed Assignment of Research Tasks for Heterogeneous Compute Environments, **Abdur Rouf**, Fahad Khan, Benjamin Keene, Shafaq Chaudhry and Murat Yuksel (Submitted).
[3] **FlexiNet:** Lightweight Traffic Fingerprinting for Resource-Constrained Environments, **Abdur Rouf**, Roya Taheri and Batyr Charyyev, IEEE GLOBECOM 2024 (Published).
[4] Latency and Bandwidth Benefits of Edge Computing for Scientific Applications, **Abdur Rouf**, Engin Arslan and Batyr Charyyev, IEEE INFOCOM 2024 (Published).

## ACHIEVEMENTS

**Competitive Programming:** 720+ LeetCode problems solved, rating 1630+.
**Grants:** IEEE INFOCOM ARO Travel Grant, UNR GSA Travel Grant, total $1750, 2023.
**Programming Contest:** Ranked top 15% in Digi Thor Programming Contest, 2021.