# Muntaka Ibnath

*Riverside, California*

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## Research Focus

- Systems Optimization and Computer Architecture
- eBPF-based Performance Monitoring and Low-Level System Instrumentation
- Energy-Efficient Techniques for Runtime and OS-level Power Management

## Education

**University of California, Riverside** — *CA, USA*
Ph.D. in Computer Science, Advisor: Daniel Wong — *September, 2023 - present*

**University of California, Riverside** — *CA, USA*
M.Sc. in Computer Science — *conferred June 2025*

**Bangladesh University of Engineering and Technology** — *Dhaka, Bangladesh*
B.Sc. in Computer Science and Engineering — *February, 2017 - May, 2022*

## Technical Skills

**Languages** Python, Go, Java, JavaScript, C/C++, Bash, SQL, HTML/CSS, XML

**Libraries/Tools** eBPF(BCC, bpftool), GPU Programming(CUDA), GCP, Kernel instrumentation tools(strace, ptrace, ftrace), Mininet, Docker, Git, React, Next.js, Material UI, Figma, Oracle, PostgreSQL

## Research Experience

**Department of Computer Science, University of California, Riverside** — *CA, USA*
Graduate Student Researcher — *September, 2023 - present*

- **Dynamic Power Management using eBPF (current):**
  - Integrating P-state and C-state scheduling algorithms in the Linux kernel using eBPF
  - Leveraging the eBPF framework from previous work (eBeeMetrics) to enhance Linux power management
  - Developing network-aware power management policies by utilizing real-time application and network performance data
  - Coordinating the entire ecosystem for power management, including CPU states and Linux scheduler policies
- **QoS Optimization utilizing Application and Network Data (current):**
  - Designing power-saving policies based on workload-specific QoS feedback with minimal latency
  - Employing low-overhead communication techniques such as real-time per-request latency measurement, eBPF's XDP, and asynchronous buffers for efficient QoS reporting
- **eBPF library for System Management Runtimes(2024-25):**
  - Developed an eBPF-based tracing library to collect feedback-free application-level latency metrics for latency-sensitive applications, without modifying application code or the kernel.
  - Validated the library's effectiveness across diverse network protocols and real-world, latency-critical workloads.
- **Adaptive Federated Learning (2023-24):**
  - Contributed to the development of an adaptive federated learning model, improving efficiency under bandwidth constraints through Mininet-based real-world network emulations
  - Validated the model's robustness and scalability, with results presented at ICCCN 2025

**Bangladesh University of Engineering and Technology**
Undergrad Thesis — *February, 2021 - April, 2022*

- Extracted 15 different flow-based features from the ISCX botnet dataset and analyzed the time complexities of the different feature selection heuristics
- Presented a comparative analysis of five feature selection heuristics, among which one resulted in around 90% detection rate
- Presented the paper in UNet '22 conference

**NeuroLandscape**
Volunteer Research Assistant — *January, 2020 - June, 2021*

- Analyzed the affordable mind monitoring technologies for the article - Affordable Technologies for Evidence Based Studies and Mind Monitoring
- Worked with Bangladesh team on one of their research projects named "Planting Seeds of Empowerment"
- Collected human-centered data by interviewing several women regarding their social and financial condition for pre and post covid times for behavioral analysis

## Publications

**eBeeMetrics: An eBPF Library for Obtaining Feedback-free Application-level Metrics** *HPCA 2026(Under Review)*
**M. Ibnath**, M. Rezvani, D. Wong

**FedBand: Adaptive Federated Learning Under Strict Bandwidth Constraints** *ICCCN 2025*
T. Alanazi, A. Fahim, **M. Ibnath**, B. Guler, A. Chowdhury, A. Swami, E. Papalexakis, S. Krishnamurthy

**On Feature Selection Algorithms for Effective Botnet Detection** *JNSM 2024*
M. Afroz, **M. Ibnath**, A. Rahman, J. Sultana, R. Rab

## Peer Reviews and Presentations

2025 **Hands on tutorial on extended Berkley Packet Filter(eBPF),** IISWC 2025 Tutorials *Irvine, CA, USA*
2025 **Sub-reviewer,** IISWC 2025 Posters
2025 **Sub-reviewer,** ICCD 2025
2025 **Sub-reviewer,** MICRO 2025

## Teaching Experience

**University of California, Riverside** *CA, USA*
Teaching Assistant *January, 2024 - March 2025*

- **Courses:** Mobile Wireless Communication, Software Construction, Introduction to Data Structures and Algorithms
- Conducted Lab classes
- Worked as the project supervisor for the term projects

**United International University** *Dhaka, Bangladesh*
Lecturer *June, 2022 - June 2023*

- **Theory Courses:** Discrete Mathematics, Software Engineering
- **Lab Courses:** Advanced Object Oriented Programming, Data Structures and Algorithms, Introduction to Computer Systems
- Designed the Human Computer Interaction theory course
- Worked as the project supervisor of 16 teams including 2 award winning teams in an Intra University Project Show Competition
- Helped students to understand course materials and use those knowledge in real-world projects

## Achievements

2023 **Dean's Distinguished Fellowship,** University of California, Riverside
2022 **Runners Up,** HerWill Datathon
2021 **Dean's Merit Award,** Bangladesh University of Engineering and Technology (BUET)
2021 **Runners Up,** Ada Lovelace Datathon
2019 **Dean's Merit Award,** Bangladesh University of Engineering and Technology (BUET)