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in Muhammad Waqas
🌐 Pakistani
⌂ Venice, Italy

# Muhammad Waqas

## Research Profile

A computational researcher with a Ph.D. in Computer Science specializing in simulation and analytical modelling of complex systems for optimization. My doctoral research focused on developing sophisticated simulation models to analyze resource allocation and efficiency trade-offs in large-scale, capacity-constrained computing systems. This work built upon my foundational experience in network science, where I applied social network metrics to successfully optimize routing protocols. This dual expertise in system simulation and network analysis drives my passion for interdisciplinary research. I am now eager to apply my quantitative skills to pressing challenges at the intersection of technology and society

## Education

**2025** **Ph.D. in Computer Science**, *Ca' Foscari University of Venice*, Venice, Italy
**Thesis:** *"Optimizing Cloud Computing Performance: Simulation of Finite-Capacity Multi-Server Queueing Systems"*
○ Designed and implemented an open-source simulation framework to model finite-capacity systems
○ Developed and validated novel scheduling algorithms (preemption strategies), achieving a 30% reduction in mean wait times while analyzing the trade-offs between QoS and system efficiency
○ Conducted rigorous statistical analysis of simulation outputs to quantify the impact of different scheduling policies on overall system behavior and resource utilization

**2017** **Masters in Software Engineering**, *COMSATS University Islamabad*, Islamabad, Pakistan
**Thesis:** *"Analysis of Convergence Time in OSPF Routing Protocol Using Social Network Metrics"*
○ Applied principles from Social Network Analysis, utilizing graph theory and centrality metrics to identify critical nodes in network topologies.
○ Developed a Java-based "Topology Analyzer" tool to implement this interdisciplinary approach.
○ Demonstrated a 22% reduction in OSPF convergence time as a result of network optimizations

## Job Experience

**2019 – 2021** **Lecturer**, *University of Lahore*, Islamabad, Pakistan
Taught undergraduate courses, supervised projects, and contributed to NCEAC accreditation and curriculum planning
○ Courses: Software Engineering, HCI, Requirements Engineering, Discrete Structures, ICT
○ Admin Roles: Batch Advisor, Member – Course Folder Review Committee

**2017 – 2019** **Lecturer**, *IQRA National University*, Peshawar, Pakistan
Delivered courses, supervised projects, and participated in academic committees
○ Courses: Formal Methods, Software Engineering, HCI, Enterprise Systems
○ Admin Roles: Member – Board of Studies, revised 3 course syllabi

## Publications

Peer Reviewed

[1] S. Akbar, R. Li, **M. Waqas**, and A. Jan, "Server temperature prediction using deep neural networks to assist thermal-aware scheduling," *Sustainable Computing: Informatics and Systems*, Elsevier, vol. 36, art. no. 100809, 2022

[2] **M. Waqas**, S. UrRehman, and S. Akbar, "Convergence time analysis of OSPF routing protocol using social network metrics," *Future Generation Computer Systems*, Elsevier, vol. 94, pp. 62-71, 2019

Conferences

[1] **M. Waqas**, A. Marin, and L. Maccari, "Finite capacity multi-server job systems: A simulation study" in *Proc. 38th Eur. Conf. on Modelling and Simulation (ECMS)*, Krakow, Poland, June 2024, pp. 150-157

Submitted

[3] **M. Waqas**, A. Marin, L. Maccari, and M. Raza, "Simulating Finite-Capacity Multiserver Queues in OMNeT++" submitted to *Future Generation Computer Systems*, Elsevier, 2025

[4] **M. Waqas**, A. Marin, and L. Maccari, "When killing jobs becomes good?" submitted to *Journal of Parallel and Distributed Computing*, Elsevier, 2025

## ▬▬▬ Additional Training

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| Coursera | **Introduction to Data Analytics** (IBM) |
| Coursera | **Introduction to Cloud Computing** (IBM) |
| HEC | **Outcome based Education** (NCEAC) |
| UniVe | **Intellectual Property and Technology Transfer** (PInK) |

## ▬▬▬ Technical Skills

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| Network Science | NetworkX, Pajek, Social Network Analysis, Graph Theory |
| Programming & Analysis | Python, MATLAB, Java, C++ |
| Simulation & Modeling | OMNeT++, NS-3, CloudSim, Formal Methods (Model Checking, Z notation) |
| Tools & Platforms | Git, VS Code, LaTeX, CZT Toolkit |

## ▬▬▬ References

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|---|---|
| Dr. Andrea Marin | Full Professor, Department of Environmental Sciences, Informatics and Statistics<br>Ca' Foscari University of Venice, Italy<br>marin@unive.it |
| Dr. Saif ur Rehman Malik | Assistant Professor, School of Computer Science and Statistics<br>Trinity College Dublin, Ireland<br>sumalik@tcd.ie |