Last Updated: September 1, 2022
+1-765-746-9458
zulfiqaa@purdue.edu
annuszulfiqar2021.github.io

Annus Zulfiqar

Education

2021–present **PhD in Computer Science (Ross Fellow)**,
Department of Computer Science, Purdue University, West Lafayette, Indiana, USA.
- **Area: *Programmable Networks, Domain-Specific Architectures***
- ***CGPA* – 4.00/4.00**
  Advisor: ***Muhammad Shahbaz***

2015–2019 **Bachelor of Electrical Engineering**,
School of Electrical Engineering and Computer Science (SEECS),
National University of Sciences and Technology (NUST), Islamabad, Pakistan.
- ***CGPA* – 3.96/4.00**
  Advisors: ***Muhammad Shahzad*** and ***Faisal Shafait***

Experience

Academic Research

Sep 2021 – Present **Graduate Research Assistant**, *NextGArchitectures Lab*, Purdue University,
Advisor: Muhammad Shahbaz.
- Building architectures for the *slow-path* at the control-plane/data-plane interface in SDN.
  - **Collaborators**: Ben Pfaff and team.
- Building an AutoML compiler and applications for ML inference on emerging data planes.
  - **Collaborators**: Kunle Olukotun and team.

Sep 2020 – Jan 2021 **Remote Researcher**, *Pervasive Parallelism Laboratory*, Stanford University,
Advisor: Muhammad Shahbaz (Postdoc Researcher).
- Designed discrete-event network simulations for load balancing techniques.

Jun – Sep 2018 **Visiting Research Intern**, *Technical University of Kaiserslautern (TUK)*, Kaiserslautern, Germany, (DAAD funded project).
- Worked on multi-temporal forest cover change detection to analyze the largest afforestation drive in Pakistan using remote sensing and deep learning.

Jun 2017 – May 2019 **Research Intern**, *TUKL lab*, SEECS, NUST,
Advisors: Faisal Shafait, Dr. Muhammad Shahzad.
- Worked on Document Processing and land cover classification problems using object detection and sequence learning techniques from deep learning.

Industry

May–Aug 2022 **Research Intern**, *VMware Inc.*, Palo Alto, California, United States.
Characterized the *slow-path* in the Open vSwitch to find abstractions/primitives to build an architecture for it.

Jun 2019 – Jul 2021 **Design Engineer**, *Center for Advanced Research in Engineering*, Islamabad, Pakistan.
Designed Ethernet/Wi-Fi/LTE-capable IoT Sensor Networks for industrial machine sensing and data telemetry.

Feb–May 2020 **Design Engineer (Part-time)**, *Technology Spirits*, Islamabad, Pakistan.
Designed a Brushless DC Motor Electronic Speed Controller (BLDC-ESC) rated at 88 Amperes of current around the STMicroelectronics STSPIN32F0 controller.

Publications

Oct 2022 Tushar Swamy, Annus Zulfiqar, Muhammad Shahbaz, Luigi Nardi, Kunle Olukotun. *Homunculus: Auto-generating Efficient Data-plane ML Pipelines for Datacenter Networks (Under Review)* | Draft |

Jun 2022 Annus Zulfiqar, Gianni Antichi, Ben Pfaff, William Tu, Muhammad Shahbaz. *The Slow-Path Needs an Accelerator Too! (Under Review)*

May 2021 **JARS.** Annus Zulfiqar, Muhammad M. Ghaffar, Muhammad Shahzad, Christian Weis, Muhammad I. Malik, Faisal Shafait, Norbert Wehn. *AI-ForestWatch: Semantic Segmentation Based End-to-End Framework for Forest Estimation and Change Detection using Multi-Spectral Remote Sensing Imagery.* | Paper | Code |

Dec 2019 **DICTA.** Annus Zulfiqar, Adnan ul-Hasan, Faisal Shafait. *Logical Layout Analysis using Deep Learning.* | Paper |

Tutorials

Aug 2022 **SIGCOMM.** Tushar Swamy, Annus Zulfiqar, Alex Rucker, Muhammad Shahbaz, Kunle Olukotun. *In-Network Machine Learning using Taurus.* | Website | Code |

Talks

Aug 2022 **VMware.** The Slow Path Needs an Accelerator Too!

Honors and Awards

Feb 2021 Ross Fellowship (worth USD 231K) recipient at Purdue University.

Nov 2018 Travel award for EECamp at KAIST, South Korea.

Sep 2018 Funded internship offer for one year at DFKI, Kaiserslautern, Germany (passed).

Jun 2018 DAAD-funded internship in Microelectronic Systems Research Group at Technical University of Kaiserslautern (TUK), Kaiserslautern, Germany.

2015-2019 NUST merit scholarship recipient.

References

1. **Muhammad Shahbaz (Purdue University)**. mshahbaz@purdue.edu
2. **Gianni Antichi (Queen Mary University of London)**. g.antichi@qmul.ac.uk
3. **Ben Pfaff (VMware)**. bpfaff@vmware.com