Curriculum Vitae

Personal details and date of CV

- Azam
- Shoaib
- ORCiD:0000-0003-3521-5098

- 13-Jan-2024

Degree

Title: Ph.D in Electrical Engineering and Computer Science (Majors: Electrical Engineering and Computer Science)
Research Area: Deep learning , Autonomous Driving, Sensorimotor Learning, and Generative Modeling
Institution: Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea
Date: August 20, 2021
Contact Details:eecs@gist.ac.kr

Title: MS in Robotics and Intelligent Machine Engineering (Majors: Robotics and Computer Vision)
Institution: National University of Science and Technology (NUST), Pakistan
Date: June 18, 2015
Contact Details:hodrime@smme.nust.edu.pk

Title: BS in Engineering Sciences (Majors: Lasers and Opto-electronics, Computer Science)
Institution: Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (GIKI), Pakistan
Date: June 02, 2010
Contact Details:faheem@giki.edu.pk

Current employment

Job Title: Postdoctoral Researcher
Employer: Aalto University, Finland
Start Date: August 01, 2022 –to– Present
Full-time Postdoctoral Researcher at the Finnish Center for Artificial Intelligence and the Intelligent Robotics Research Group, Aalto University, Finland, led by Prof. Ville Kyrki. Focused on designing methods for end-to-end autonomous driving, emphasizing generalization and safe planning strategies.

Previous work experience

Job Title: Postdoctoral Researcher
Employer: Gwangju Institute of Science and Technology, South Korea
Start Date: September 01, 2021 — June 17, 2022
Worked as a full-time Postdoctoral Researcher at GIST's Machine Learning and Vision Lab, focusing on mobile robotics, indoor navigation, and developing representation learning methods for mobile navigation.

Job Title: Graduate Researcher
Employer: Gwangju Institute of Science and Technology, South Korea
Start Date: September 01, 2015 — August 20, 2021
Full-time PhD Graduate Student at GIST's Machine Learning and Vision Lab, leading a comprehensive autonomous vehicle project covering key aspects like mapping, localization, and control.

Research funding and grants

- **Development of service robot and contents supporting children's reading activities based on artificial intelligence (R2022060001)** (PI: Prof Moongu Jeon, GIST, South Korea)(Date: 2022.05-2024.12)
  - During postdoctoral at GIST, engaged in the development of navigation and planning algorithms for mobile robots, culminating in successful demonstrations to university faculties and national research institutes and companies.
- **Development of autonomous driving and healthcare convergence-based technology (K14510)**(PI: Prof Moongu Jeon, GIST, South Korea)(Date: 2021.09-2022.02)
  - Participated as postdoctoral researcher in the development of autonomous driving and application to healthcare system at GIST
- **Development of core autonomous driving and driving assistance technology and establishment of platform**(PI: Prof Moongu Jeon, GIST, South Korea)(Date: 2018.01.-2018.12)
  - Led the project as PhD student at GIST
  - Engaged in the development of autonomous driving, ranging from sensor installation, acquisition, localization, perception, planning and control.
- **Building an AR/VR-based virtual autonomous driving simulation platform**(PI: Prof Moongu Jeon, GIST, South Korea)(Date: 2017.05-2017.12)
  - Participated as PhD student in building the simulation environment for the autonomous driving on the top of robot operating system (ROS).

Research output

1. **Azam, S., Munir, F., Rafique, M. A., Sheri, A. M., Hussain, M. I., & Jeon, M. (2021). N 2 C: neural network controller design using behavioral cloning. IEEE Transactions on Intelligent Transportation Systems, 22(7), 4744-4756.** https://doi.org/10.1109/TITS.2020.3045096
   - As the first author, designed the development of the N2C, a neural network-based controller using behavioral cloning, which significantly outperformed traditional controllers in autonomous vehicle navigation, demonstrating its efficacy in real-world applications and datasets.
2. **Azam, S., Munir, F., Sheri, A. M., Kim, J., & Jeon, M. (2020). System, design and experimental validation of autonomous vehicle in an unconstrained environment. Sensors, 20(21), 5999.** https://doi.org/10.3390/s20215999
   - As the lead author, developed a cost-effective full-stack autonomous vehicle with a limited sensor suite, proving its effectiveness in real-world testing and application as an autonomous taxi service.
3. **Munir, F., Azam, S., Jeon, M., Lee, B. G., & Pedrycz, W. (2021). LDNet: End-to-end lane marking detection approach using a dynamic vision sensor. IEEE Transactions on Intelligent Transportation Systems, 23(7), 9318-9334.** https://doi.org/10.1109/TITS.2021.3102479
   - As a co-author, contributed in developing a novel lane detection model using an event camera for autonomous vehicles, significantly enhancing accuracy and reducing computational demands, surpassing existing methods in performance metrics.
4. **Ko, Y., Lee, Y., Azam, S., Munir, F., Jeon, M., & Pedrycz, W. (2021). Key points estimation and point instance segmentation approach for lane detection. IEEE Transactions on Intelligent Transportation Systems, 23(7), 8949-8958.** https://doi.org/10.1109/TITS.2021.3088488
   - Contributed in the reviewing the article and refactoring the method for implementing on the real autonomous vehicle.
5. **Munir, F., Azam, S., Rafique, M. A., Sheri, A. M., Jeon, M., & Pedrycz, W. (2022). Exploring thermal images for object detection in underexposure regions for autonomous driving. Applied Soft Computing, 121, 108793.** https://doi.org/10.1016/j.asoc.2022.108793
   - As a co-author, I contributed to developing a domain adaptation framework for object detection in thermal images, significantly enhancing autonomous driving capabilities in challenging

environments.

Other research outputs:

- Autonomous Vehicle Demonstration https://azamshoaib.github.io/
- Opensource code for Multi-Modal Fusion for Sensorimotor Coordination in Steering Angle Prediction (DRFuser)https://github.com/azamshoaib/DRFuser
- DRFuser Dataset https://github.com/azamshoaib/DRFuser
- Opensource code for Key points estimation and point instance segmentation approach for lane detection. https://github.com/koyeongmin/PINet

Research supervision and leadership experience

- Co-supervised MS student at Aalto University, Finland
- Led autonomous vehicle project at GIST, South Korea, as PhD and postdoctoral researcher (2015–2022).

Teaching merits

Job Title: Teaching Assistant, Gwangju Institute of Science and Technology, South Korea (September 01, 2015- August 20, 2021)

- Artificial Intelligence
- Machine Learning

Job Title: Electronic Engineer, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Pakistan (September 01, 2010 — July 1, 2015)

- Teaching Assistant: Differential Equation, Numerical Analysis,Electricity and Magnetism
- Lab Instructor: Electricity and Magnetism Lab, Signal and System Lab, Electronics-I Lab, Circuit Analysis-I Lab, Instrumentation Lab

Awards and honours

- Korean Government Scholarship for Graduate Studies

Other key academic merits, such as

- IEEE Member
- IEEE Technical Committee Member of Comsumer Technology Society (IEEE CTSoc)
- Reviewer Activity
  - European Conference on Computer Vision (ECCV)
  - IEEE Transactions on Intelligent Vehicles (IV)
  - IEEE Intelligent Transportation System Conference (ITSC)
  - IEEE Transaction of Intelligent Transportation Systems (T-ITS)

Scientific and societal impact

- Led pivotal projects in autonomous vehicle research at GIST, advancing open science through innovative contributions to machine learning and navigation systems, also expanding my research in this direction at Aalto University.
- Served in influential roles, including as a technical committee member for IEEE CTSoc, enhancing responsible research and innovation in intelligent transportation.
- Demonstrated commitment to science communication through active participation and submitting research output in international conferences and journals.