Shoaib **Azam**
Deep Learning Professional

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Department of Electrical Engineering and Automation, Aalto University, Finland

Skillful and adaptable deep learning professional with experience in developing deep learning-based solutions for robotics and computer vision applications.

Education

2015-2021 **PhD**, Electrical Engineering and Computer Science, Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea. **Thesis:**"Deep Neural Networks for Understanding Autonomous Vehicle Behavior and Control". **Research Area :** Deep learning , Autonomous Driving, Sensorimotor Learning and Representation Learning)

2011-2015 **MS**, Robotics and Intelligent Machine Engineering,National University of Science and Technology (NUST), Pakistan

2006-2010 **BS**, Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (GIKI), Pakistan

Experience

Aug'2022 – Present | **PostDoctoral Researcher, Intelligent Robotics, Aalto University, Finland**

- Developing end-to-end solutions for the safe planning of autonomous vehicle using imitation learning and reinforcement learning.

Sep'2021 – June'2022 | **PostDoctoral Researcher, Machine Learning and Vision Lab, Gwangju Institute of Science and Technology, Gwangju, South Korea**

- Lead the indoor mobile robotics project funded by Ministry of Culture, Sports and Tourism, Republic of Korea.
- Built the representation learning framework for end-to-end navigation of mobile robot in the closed environment using imitation learning.
- Develop the 3D reconstruction of the indoor environment using depth cameras.
- Built a ML pipeline for face-enabled door lock system.

Aug'2015 – Aug'2021 | **Graduate Researcher, Machine Learning and Vision Lab, Gwangju Institute of Science and Technology, Gwangju, South Korea**

- Successfully developed the full-stack autonomous vehicle using the limited amount of sensors suite.
- Successfully demonstrated the working of autonomous vehicle's modules ranging from mapping, localization, perception, planning and control.
- Developed a neural network-based controller (N2C) for the autonomous vehicle using behavioral cloning as surrogate to classical controller. The controller predicts predicts throttle, brake, and torque when trained with the manual driving data acquired from the vehicle CAN bus.
- Successfully developed an end-to-end pipeline for predicting the speed and steering angle with image data as an input using imitation learning approach.
- Designed the perception module for vehicle pose estimation, object modelling from Lidar data and radar-based object detection.
- Published the research in peer-reviewed journals and international conferences as lead author and co-author.
- Designed an end-to-end infrastructure pipeline for autonomous taxi service using AWS.
- Architect the IoT sensors configured in ROS environment with the non-ROS system through WebAPI for the communication between consumer and autonomous taxi service.

Jul'2011 – Jul'2015 | **Research Assistant, National University of Science and Technology, NUST, Pakistan**

- Successfully completed and analyzed a detailed study of saliency detection in images and videos.
- Developed a benchmark of computational models to predict human fixation in videos.
- Successfully Designed a weighted algorithm for assigning weights both manually (user defined) and automatically.

Transferable Skills

ML/DL	CNN, Diffusion Models, RNN/LSTM, Transformers.
MLOps	MLFlow, AWS, Kinesis, Lambda.
Programming	Python, Javascript
DL Libraries	Pytorch, Keras
Computer Vision	Object detection (Lidar and Camera), Sensor Fusion, Lane Detection and Segmentation
Middleware	Robot Operating System (ROS)
Autonomous Driving Datasets	NuScenes, Lyft, Udacity, Davis Driving Dataset
Autonomous Driving Simulation Softwares	Autoware, CARLA, CarMaker, Carlagym
Operating System	Linux, Windows, Docker (virtualization)
Office Automation	LaTeX, Pack Office(Word, Excel, PowerPoint).

Selected Publications

- **Shoaib Azam**, F. Munir,M. A. Rafique, AM. Sheri, MI Hussain and M. Jeon, "N2C : Neural Network Controller Design Using Behavioral Cloning", IEEE Transactions on Intelligent Transportation Systems (IF : 9.551). Jan 2021.

- **Shoaib Azam**, F. Munir, A.M. Sheri, J. Kim and M. Jeon, "System, Design and Experimental Validation of Autonomous Vehicle in an Unconstrained Environment", Sensors (IF : 3.576), accepted, Oct 2020.

- **Shoaib Azam**, Farzeen Munir and Moongu Jeon, "Channel Boosting Feature Ensemble for Radar-based Object Detection", IEEE Intelligent Vehicles Symposium (IV), Nagoya University, Nagoya, Japan , July 11-15, 2021.

- **Shoaib Azam**, Farzeen Munir, Ahmad Muqeem Sheri, Ishfaq Hussain, YeongMin Ko and Moongu Jeon, "Data fusion of Lidar and Thermal Camera for Autonomous driving", Applied Industrial Optics Meeting, Washinton DC, USA, July 8-10, 2019.

- **Shoaib Azam**, Farzeen Munir, Aasim Rafique, YeongMin Ko, Ahmad Muqeem Sheri and Moongu Jeon, "Object Modeling from 3D Point Cloud Data for Self-Driving Vehicles", IEEE Intelligent Vehicles Symposium(IV) 2018, June 25-30, China.