

GHULAM MUSTAFA

Department of Computer Science and engineering at University of Bologna, Italy

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OBJECTIVE

To pursue a career in advancing AI and machine learning techniques to develop innovative solutions for real-world challenges. I aim to leverage my expertise to drive technological advancements, optimize systems, and contribute to transformative applications in computer science and intelligent systems.

EDUCATION

University of Bologna, Italy

November 2024 – Present

PhD in Computer Science and Engineering

Advisor: Prof. Dr. Claudio Sartori

Sun Moon University, South Korea

March 2022 – December 2023

M.S. in Computer and Electronics Convergence Engineering

GPA: 4.4/4.5

Advisor: Prof. Dr. Youngsup Hwang

Thesis: Bus Travel Time Prediction in Cheonan City Using Deep Learning with DTG Data

Karabük University, Turkey

February 2020 – July 2020

Department of Computer Engineering (Exchange Program)

Quaid-e-Awam University (QUEST), Pakistan

January 2017 – January 2021

B.S. in Computer Science

GPA: 3.74/4.0

Thesis: Application of Drone Surveillance for Advanced Agriculture Monitoring Using CNN

EXPERIENCE

Lecturer, Department of Artificial Intelligence and Multimedia Gaming

Aror University of Art, Architecture, Design & Heritage, Sindh, Pakistan *August 2024 – Present*

Delivering courses ranging from foundational topics like Introduction to Computing to advanced areas such as Artificial Intelligence and Deep Learning. Mentoring students in research methodologies and fostering their skills in independent research and practical AI applications.

Teaching Assistant, Computer Science

Institute of Science and Technology, Nawabshah, Sindh, Pakistan *January 2021 – January 2022*

Assisted in course preparation, conducted tutorials and lab sessions, and provided personalized support to students in understanding complex computer science concepts and problem-solving.

RESEARCH INTEREST

- Machine learning
- Deep learning
- Prediction algorithm
- Trajectory Pattern Mining
- Intelligent Transportation Systems
- Traffic Data Analysis.

RESEARCH PROJECTS

Prediction of Bus Travel Time in Cheonan City Using Deep Learning with DTG Data

Sun Moon University & Dankook University, South Korea

March 2022 – December 2023

Developed a bus travel time prediction algorithm using digital tachograph data (DTG) in Cheonan, South Korea.

- Data collected from buses operating on an 8.5 km high-traffic route with a diverse pattern of commuters.
- Built deep learning models to analyze traffic dynamics and improve prediction accuracy.
- The project was supported by the Basic Science Research Program through the NRF, funded by the Ministry of Science.

Hybrid ConvLSTM with Attention for Precise Driver Behavior Classification

Sun Moon University & Dankook University, South Korea

March 2022 – December 2023

Designed the **HCLA-DBC** model combining CNN, LSTM, and Attention layers to classify driver behavior.

- Used the UAH-Driveset dataset to classify driver behaviors with high accuracy.
- Integrated CNN for feature extraction, LSTM for sequence learning, and attention mechanisms for improved performance.
- The model outperformed traditional methods in robustness and accuracy.

TrafficNet: A Hybrid CNN-FNN Model for Traffic Accident Analysis in Seoul

Sun Moon University & Dankook University, South Korea

March 2022 – December 2023

Traffic accidents analyzed in Seoul using deep learning techniques.

- Using public accident data (2010-2018) to identify the main factors that influence the severity of the accident.
- Developed a hybrid CNN-FNN model to uncover patterns and correlations for safer urban mobility.
- The project was supported by the Basic Science Research Program through the NRF, funded by the Ministry of Science.

Application of Drone Surveillance for Advanced Agriculture Monitoring Using CNN

Quaid-e-Awam University of Engineering, Science and Technology, Pakistan

January 2019 –

December 2019

Used drone surveillance and deep learning for the detection of plant diseases.

- Using the PlantVillage dataset and testing multiple algorithms for accurate disease classification.
- EfficientNet-B3 achieved the highest accuracy due to its robust feature extraction capabilities.

PUBLICATION

JOURNAL PUBLICATION

1. **Ghulam Mustafa**, Youngsup Hwang, Seong-je Cho; "TrafficNet: A Hybrid CNN-FNN Model for Analysis of Traffic Accidents in Seoul" **accepted** to Journal of Computing Science and Engineering (JCSE) Korea - **DOI** : <http://dx.doi.org/10.5626/JCSE.2023.17.4.182> (**IF: 0.196**) .
2. **Ghulam Mustafa**, Youngsup Hwang, Seong-je Cho; "Prediction of Bus Travel Time in Cheonan City Using Deep Learning with DTG Data" **submitted** to **Machine Learning: Science and Technology (IF: 6.013)** .
3. Shah, S.A.; **Ghulam Mustafa** ; Keerio, H.A.; Sattar, M.N.; Hussain, G.; Mehdi, M.; Vistro, R.B.; Mahmoud, E.A.; Elansary, H.O. Application of Drone Surveillance for Advance Agriculture Monitoring by Android Application Using Convolution Neural Network. **Agronomy 2023**, 13, 1764. - **DOI** : <https://doi.org/10.3390/agronomy13071764> (**IF: 3.7**)
4. Fida Hussain Dahri , **Ghulam Mustafa** ; Automatic Face Mask Detection and Recognition Using Deep Learning. *IJSER* **November 2022 (IF: 4.2)**

INTERNATIONAL CONFERENCES PROCEEDING

1. **Ghulam Mustafa**, Youngsup Hwang, Seong-je Cho; "Hybrid ConvLSTM with Attention for Precise Driver Behavior Classification " **accepted** to AIKE 2023 : IEEE International Conference on Artificial Intelligence & Knowledge Engineering, **California , USA. 2023.**
DOI : <https://doi.ieeecomputersociety.org/10.1109/AIKE59827.2023.00008>.

AWARDS AND HONORS

- Received the prestigious Professor's Research Scholarship in Bio-informatics and Pattern Recognition Laboratory for pursuing the Master's Program at Sun Moon University, South Korea (SMU), Asan. The scholarship was granted under the project titled "**An Effective/Intelligent Framework for Vehicle Digital Forensics**," which is financially supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF), and funded by the Ministry of Science and ICT. The scholarship was awarded in March 2023.
- During my undergraduate studies, I was honored to be awarded the Silver Medal in the faculty of Computer Science.
- During my undergraduate studies, I secured the 3rd position in the Faculty of Computer Science at QUEST Nawabshah.
- Secured 2nd Position in Undergraduate Final Year Project.
- As part of a good academic record in an undergraduate degree, I completed a semester exchange program at Karabauk University in Turkey.
- Selected for the PM-Laptop Scheme on a Merit Basis.
- Secured the first position in my college and was awarded a prize from the college.

TECHNICAL AND DIGITAL SKILLS

- **Language:** Python, C++, C, Java, Java Script.
- **Database:** MySQL, SQLITE, Firebase.
- **Software and Tools:** Google Earth Pro, PyCity, NetworkX, SUMO (Simulation of Urban Mobility), Jupyter Notebook.
- **Hardware:** Arduino, Raspberry Pi.

INTERNSHIPS

Internship at Pakistan Telecommunication Ltd (PTCL) *01/12/2018 – 10/06/2019*

During my 6-month internship at PTCL, I gained hands-on experience in Networking. I learned to configure and troubleshoot network infrastructures, ensuring seamless data transmission. Collaborating with professionals enriched my understanding of the latest networking trends and technologies. This experience strengthened my passion for the field and equipped me with valuable expertise for my career.

Internship at ICT Center QUEST Nawabshah *13/05/2019 – 03/06/2019*

During my 20-day internship at the ICT Center, Quaid-e-Awam University of Engineering Science and Technology in Nawabshah, I gained hands-on experience in cutting-edge technology. Working alongside professionals, I honed my skills in software development, data analysis, and network administration. This transformative experience fueled my passion for technology and paved the way for my personal and professional growth in the ICT field.

REFERENCES

Professor Youngsup Hwang, Ph.D.

Division of Computer Science and Engineering, Sun Moon University, Asan-si 31461, Republic of Korea
Email: young@sunmoon.ac.kr

Professor Seong-Je Cho, Ph.D.

Department of Software Science, Dankook University, Yongin-si 16890, Republic of Korea;
Email: sjcho@dankook.ac.kr

Professor Sabab Ali Shah, Ph.D.

Faculty of Architecture and Town Planning, Aror University of Art, Architecture, Design and Heritage, Sukkur 6500, Pakistan.
Email: sayedsabab@hanyang.ac.kr

LANGUAGE

English: IELTS 6:0 Overall Bands

Korean: Basic Level