

# Curriculum Vitae

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## Personal Information

Name: Hamza Mukhtar  
Citizenship: Pakistan  
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Homepage: <https://hamza-hm-mukhtar.github.io/>  
Profiles: Google Scholar, GitHub, LinkedIn

## Research Interests

Efficient deep learning, Computer Vision, Large language models, Reinforcement learning, Generative Models

## Education

**UET - University of Engineering and Technology**, Lahore, Pakistan  
Department of Computer Science UET Lahore **2020 – 2023**  
• MS Computer Science, *GPA: 3.85/4.0* March 2023  
thesis: Transformer network for multi-person tracking and re-identification in unconstrained environment  
advisors: Dr. Usman Ghani

**UMT - University of Management and Technology**, Lahore, Pakistan  
School of Systems and Technology UMT Lahore **2015 – 2019**  
• BS Software Engineering, *GPA: 3.85/4.0* April 2019  
thesis: Vehicle collision prevention system (VCPS)  
advisors: Dr. Shahid Awan

**Lahore University of Management Sciences**, Lahore, Pakistan  
NIC - National Incubation Center Lahore **2018 – 2019**  
• Entrepreneurship Development Program, March 2019

## Industrial Experience

**Freelancing** in deep learning, data analysis and AI-powered app development **2020 – 2023**  
Selected projects:  
• [Item forecasting for clothing brand](#) (Python TensorFlow, scikit-learn, streamlit)  
• Processing data of Polish schools for project [Szkolomat \(projekt:polska\)](#) — data consultancy, data cleaning and merging, geocoding, item response theory (Python: SciPy, Pandas).  
• Custom interactive charts for [Data4Cure](#) (D3.js).  
• Evaluation of investment potential for [Startup Compass](#) (Python: scikit-learn, Pandas; R: party).

**Sagacious (Pvt.) Ltd**, Lahore, Pakistan  
Machine Learning Engineer **March – June 2019**  
• Microservice APIs for data sending and receiving (Python: FastAPI, Django, and Flask)  
• Machine learning pipelines development

## Research Experience

**Machine Learning Engineer** **July 2020-Present**  
[Intelligent Criminology Research Lab](#), NCAI Supervisor: Dr. Usman Ghani

- Worked on the vision-powered autonomous ground vehicle using ROS.
- Developed vision-based fruit yield estimation system
- Worked driver alert system vision based on RGN and depth sensors
- worked on production monitoring in the sugar industry
- Worked on rice crop monitoring

**Research Officer,** **July 2019-June 2020**  
**COMPUTER VISION AND MACHINE LEARNING LAB, KICS** Supervisor: [Dr. Usman Ghani](#)

- Worked on the vision-powered autonomous ground vehicle using ROS.
- Developed vision-based fruit yield estimation system
- Worked driver alert system vision based on RGN and depth sensors
- worked on production monitoring in the sugar industry
- Worked on rice crop monitoring

**Undergraduate Research Assistant,** **Oct-Dec 2019**  
 University of Management and Technology Supervisor: [Dr. Shahid Mahmood Awan](#)

- Worked on text extraction and recognition from traffic license.

**Undergraduate Research Assistant,** **May-June 2019**  
 Vision and Image Processing Research Group, UMT Supervisor: [Dr. Syed Farooq Ali](#)

- [Worked on Driver's Distraction Detection using a fixed monocular camera](#)

#### Courses, Certificates

##### Online Certification

- Managing Machine Learning Projects with Google Cloud [Google Cloud](#) 2020
- Tools for Data Science [IBM](#) 2020
- Data Science Orientation [IBM](#) 2020
- Data Science Math Skills [Duke University](#) 2020
- Convolutional Neural Networks in TensorFlow [DeepLearning.ai](#) 2020
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization [DeepLearning.ai](#) 2020
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning [DeepLearning.ai](#) 2020
- Neural Networks and Deep Learning [DeepLearning.ai](#) 2020

#### Academic Appointments

##### Teacher Assistant

- Machine Learning course 2018
- Data Structure and Algorithms Systems course 2017

#### Awards

- Rector Award in BS Software Engineering (highest GPA) at the University of Management and Technology Lahore convocation 2019
- [Rector Medal](#) in BS Software Engineering at the University of Management and Technology Lahore convocation 2019
- Dean Award in BS Software Engineering (highest GPA in semester) at the University of Management and Technology Lahore Fall 2017
- Winner of Annual Data Science Hackathon (Deep Learning Category) University of Management and Technology Lahore 2018
- Selected for Incubation in National Incubation Centre at Lahore University of Management

- Sciences from 600 applicants all over Pakistan (a total of 20 were selected). The Ministry of Information Technology Pakistan's initiative to groom young entrepreneurs. 2018
- Selected for the MSI Entrepreneurial Development program offered by Ministry of Information Technology Pakistan 2018
- Selected for the Design Thinking training offered by [Innovation Skills Institute](#) 2019
- Semi-Finalist in [DICE Business Plan Competition](#) at the University of Management and Technology Lahore. 2018

#### Technical skills

- Programming Language: Python, Dart and C++
- App Development: Flutter (Android, iPhone and Web)
- Deep Learning Framework: Tensorflow, PyTorch and Keras
- Libraries: Scikit-Learn, OpenCV, OpenAI Gym, Transformer and HuggingFace
- Web Framework: Django and Flask
- Version Control: Git and GitHub
- Academic Tool: LaTeX and Draw.io
- Systems (user): Linux, macOS and Windows

#### Publications

##### Books

- Tanzila Saba, Usman Ghani Khan **Hamza Mukhtar**, Amjad Rehman, Advancement in Digital Image Processing from Traditional to Deep Learning, (Under review).

##### Journal Papers

- Hamza Mukhtar**, Adil Afzal, Sultan Alahmari, Saud Yonbawi, [CCGN: Centralized collaborative graphical transformer multi-agent reinforcement learning for multi-intersection signal free-corridor](#), Neural Networks (2022). *Impact factor: 7.8*
- Hamza Mukhtar**, Muhammad Usman Ghani, [STMMOT: Advancing multi-object tracking through spatiotemporal memory networks and multi-scale attention pyramids](#), Neural Networks (2023). *Impact factor: 7.8*
- Hamza Mukhtar**, Muhammad Usman Ghani, [CMOT: A cross-modality transformer for RGB-D fusion in person re-identification with online learning capabilities](#), Knowledge-Based Systems (2023). *Impact factor: 8.8*
- Hamza Mukhtar**, Muhammad Usman Ghani, [Progressive Learning in Cross-Modal Cross-Scale Fusion Transformer for Visible-Infrared Video-Based Person Reidentification](#), Information Sciences (under review). *Impact factor: 8.1*
- Amjad Rehman Khan, **Hamza Mukhtar**, Muhammad Usman Ghani, Tanzila Saba, Omer Riaz, Muhammad Usman Ghani Khan, SAEED Ali Bahaj , [Scene Graph Generation With Structured Aspect of Segmenting the Big Distributed Clusters](#), IEEE Access (2022). *Impact factor: 3.9*

##### Conference Papers

- Hamza Mukhtar**, Muhammad Zeeshan Khan, Muhammad Usman Ghani Khan, Tanzila Saba, Rabia Latif, [Wheat Plant Counting Using UAV Images Based on Semi-supervised Semantic Segmentation](#), in Proc. of the International Conference on Artificial Intelligence and Data Analytics (CAIDA) (2021)
- Hamza Mukhtar**, Muhammad Zeeshan Khan, Muhammad Usman Ghani Khan, Haseeb Younis, [Wheat Disease Recognition through One-shot Learning using Fields Images](#), in Proc. of the International Conference on Artificial Intelligence (ICAI) (2021)
- Hamza Mukhtar**, Muhammad Ahmad Hasan, Muhammad Usman Ghani Khan, [ROS-Based Global Path Planning for Autonomous Ground Robot Using the Pre-Built Map of the Envi-](#)

[ronment](#), in PProc. of the International Conference on Robotics and Automation in Industry (ICRAI) (2021)

- Haseeb Younis, Muhammad Zeeshan Khan, Muhammad Usman Ghani, **Hamza Mukhtar**, [Robust Optimization of MobileNet for Plant Disease Classification with Fine Tuned Parameters](#), in Proc. of the International Conference on Artificial Intelligence (ICAI) (2021)