

# Usman Asim

AI ENGINEER · MLOPS ENGINEER

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“Be the change you want to see in the world.”

## Summary

A result-oriented AI Research and Development Engineer with more than 4 years of expertise in Computer Vision, Machine Learning, Deep Learning, Automation/MLOps and AI Model Deployment. While I am undoubtedly a self-proclaimed super nerd who takes great pleasure in customizing development environments using PyTorch, TensorFlow, Linux, Docker, and Kubernetes, my true passion lies in devising improved problem-solving methods for complex tasks. I am always eager to expand my knowledge by embracing new technologies and tools as needed.

## Skills

<b>Proficient</b>	Python, MATLAB, DIP, AI, ML, OpenCV, PyTorch, TensorFlow, Docker, Kubernetes, Kubeflow, Jira, Confluence, Git, NVIDIA Jetson, C++
<b>Familier</b>	NLP, MLOps, GoogleCloud, Julia, C#, Raspberry Pi, Arduino, Wordpress, SQL, MySQL
<b>Miscellaneous</b>	Linux, Yocto-Project, Edge Devices, Hailo-15, V3H, V4H, TDA4VM, Server, DGX, Microsoft Windows, Microsoft Office, Visual Studio, PyCharm, Colab, FreeSurfer, BET, FSL, SPM12.

## Work Experience

### DeltaX.ai

Seoul, S.Korea

AI Researcher

Sep. 2022 - Present

- Worked with model quantization (QAT) and deployment for Texas Instruments Jacinto, Renesas V3/V4H and Hailo-15 evaluation boards. Building Yocto-based custom OS Images, and inference applications dev using GStreamer and Python for vehicle monitoring systems.
- Automated containerized (Docker) CI/CD pipelines, enhancing MLOps and model deployment efficiency.
- AI model development, focusing on classification, object detection, face landmarks, and segmentation using SOTA methods.
- **Technical Skills:** Model Quantization, Python, PyTorch, Docker, GStreamer, C++, Linux, Scripting, Git, Yocto, Bitbake, CMake, Flask.
- **Soft Skills:** Teamwork, Time Management, Communication, Report Writing

### UNOMIC Co., Ltd

Busan, S.Korea

AI Research Engineer

Mar. 2022 - Sep. 2022

- Designed a Docker containerized (Kubernetes) based CI/CD pipeline covering model training to serving.
- Developed a cloud-native Alzheimer's Disease detection app utilizing 3D CNNs trained on brain MRI data.
- Trained 3D-CNN model over shifted patch tokenization for MRI-based diagnosis of Alzheimer's disease using segmented hippocampus, and improved 10% of accuracy.
- **Technical Skills:** Model Training, Python, PyTorch, MONAI, FreeSurfer, BET, FSL, Docker, Linux, Scripting, Git.
- **Soft Skills:** Teamwork, Time Management, Communication, Report Writing

### AI Vision Lab, CAU

Seoul, Korea

Research Assistant

Aug. 2019 - Jan. 2020

- Developed advanced image segmentation algorithms, including an innovative model with active contour and dilated convolution techniques, and applied them to research projects on brain stroke image generation (NRF-funded) and maritime object detection (NIA-supported)
- **Technical Skills:** Model Training, Python, MATLAB PyTorch, Linux, Git.
- **Soft Skills:** Research Methodology, Problem assessment, Literature Review

## Education

### Chung-Ang University

Seoul, S.Korea

Master's in Computer Science

Mar 2020 - Feb 2022

- **Courses:** Advanced Algorithms, Machine Learning, Deep Learning, Advanced Artificial Intelligence, Advanced Computer Graphics, Advanced Image Processing, Big Data
- **Thesis:** Active Contour Model for Image Segmentation with Dilated Convolution Filter

### COMSATS University, Islamabad

Wah, Pakistan

BS in Computer Science

Sep 2015 - Aug 2019

- **Major Courses:** Digital Image Processing, Neural Networks, Artificial Intelligence, Visual Programming, Data Structure
- **Best AI FYP Winner:** Title: Automatic Image Classification Toolkit for Researchers of Computer Vision - MATLAB App

# Projects, Honors, Awards & Expo's

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## PROJECTS

- May. 2023 **Hand Gesture recognition**, In this project, I developed a classification application for Hand gestures recognition, I used the Yolo-Keypoint to detect the hand position and dynamically cropped the hand for the classification model. *Seoul, Korea*
- Dec. 2019 **Tumor Segmentation using U-Net**, In this research project I was responsible for conducting CNN-related model training experiments and developing a U-Net model for 2D brain MRI tumor classification, later this project led to a research article. *ISB, Pakistan*
- May. 2019 **Automated Classification Toolkit for Medical Imaging Researchers**, In this project, I developed a MATLAB extension toolkit for Medical Imaging Researchers, that can load the cancer images dataset, perform the preprocessing tasks, extract the features according to user selection and train on various Machine Learning algorithms, in the end, it gives the performance comparison. *COMSATS University Islamabad*
- Dec. 2019 **Offline Signature verification**, In this project, I contributed to collecting and labelling the Offline Signature Recognition Dataset, and other team members were responsible for the CNN model training and model evaluation, later this project was published as a research article. *Pakistan*
- Jan. 2019 **Exam Hall Cheating Detecting using Deep Neural Networks**, In this project, we collected a video dataset of students taking exams in the examination hall, and manually identified and labelled the student's cheating activities during exams. Using this dataset, we trained an object detector (Faster-RCNN) to detect cheating students. *COMSATS University Islamabad*
- Jun. 2018 **Agricultural Field Disease Identification Robot**, In this project we programmed a robot using Aurdino, it travels inside the farms and detects crop diseases, for detection purposes, we train the VillagePant Dataset and run the prediction module on the Raspberry Pi. *COMSATS University Islamabad*

## AWARDS

- 2019 **Winner**, The Chung-Ang University Young Scientist Scholarship (CAYSS) *Seoul, S.Korea*
- 2019 **Gold Prize**, Winner of Speed Programming at Air University *ISB, Pakistan*

## CERTIFICATES

- Oct. 2021 **Course**, Convolutional Neural Networks *Coursera*
- Jul. 2022 **Specialization**, TensorFlow: Advanced Techniques *Coursera*
- Jul. 2022 **Specialization**, Machine Learning Engineering for Production (MLOps) *Coursera*
- Oct. 2023 **Certificate**, IELTS - The International English Language Testing System (Band # 7) *Seoul, S. Korea*

## EXPO'S

- 2023 **AI Expo KOREA**, Presented DeltaX (Bronze sponsor) Cabin Monitoring Solutions *Seoul, S.Korea*
- 2023 **Hyundai Open Innovation Lounge**, Presented DeltaX (PoC) Driver Monitoring Solutions *Seoul, S.Korea*

## Publications

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- ViT-PGC: vision transformer for pedestrian gender classification on small-size dataset  
Farhat Abbas, Mussarat Yasmin, Muhammad Fayyaz, Usman Asim  
*Pattern Analysis and Applications* pp. 1805–1819. Springer, 2023
- Image Generation Network Model based on Principal Component Analysis  
Gi Soon Cha, Usman Asim, Myung Keun Song, Asim Niaz, Kwang Nam Choi  
*2022 Asia Conference on Advanced Robotics, Automation, and Control Engineering (ARACE)*, 2022
- 3D-CNN method over shifted patch tokenization for MRI-based diagnosis of Alzheimer's disease using segmented hippocampus  
Aalfin Emmamuel, Usman Asim, Heungsik Yu, Sungun Kim  
*Journal of Multimedia Information System* pp. 245–252. Korea Multimedia Society, 2022
- Active contour model for image segmentation with dilated convolution filter  
Usman Asim, Ehtesham Iqbal, Aditi Joshi, Farhan Akram, Kwang Nam Choi  
*IEEE Access* pp. 168703–168714. IEEE, 2021
- Saliency-based Active Contour Model for Image Segmentation and Region Detection  
Aditi Joshi, Mohammed Saquib Khan, Usman Asim, Asad Munir, Hyun Chul Song, Kwang Nam Choi  
*2021 International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS)*, 2021
- Saliency-driven active contour model for image segmentation  
Ehtesham Iqbal, Asim Niaz, Asif Aziz Memon, Usman Asim, Kwang Nam Choi  
*IEEE Access* pp. 208978–208991. IEEE, 2020

**References available upon request.**