# Asad Imtiaz Malik

asadimtiazmalik | asadimtiazmalik | asadimtiazmalik@gmail.com | +92.331.2551167

## Summary

I am an ambitious A.I. developer with 2+ years industry and research experience. My interests lie in computer vision and model optimization. In future, I envision myself transitioning into a data engineering role, where I can further refine my skills in handling large-scale datasets, designing robust data pipelines, and implementing scalable infrastructure for complex ML projects.

## Education

2019 - 2023 B.S. Computer Science at **NUST**, Islamabad, Pakistan (GPA: 3.65/4.0)
2014 - 2016 Cambridge GCE A levels (Grades: 3As)

## Skills

**Languages** Python, SQL, C++, C, JAVA, Javascript
**Frameworks** Pytorch, TensorFlow, Keras, Django, Flask, Streamlit
**Tools** Docker, Git, PostgreSQL, MySQL, SQLite

## Work Experience

**Research Fellow at Machine Vision and Intelligence Systems Lab, NUST** Jun 2022 - present

- Labeled and annotated 2000 acres of satellite data for improved dataset quality
- Collected a novel wheat dataset from NARC using UAVs and multispectral cameras.
- Developed a predictive model for wheat crop phenological stage determination with 1 day difference.
- Achieved 90% accuracy in detecting stressed and disease-affected regions in wheat crops using NDVI-based techniques.

**Research Intern at TUKL** Jan 2021 - Jan 2022

- Successfully worked on EEG signal classification, achieving 92% accuracy while employing plethora of architectures such as shallow and deep CNNs, RNNs and LSTM based architectures .
- Applied the Vision Transformer (ViT) model to dental radiographs, achieving a high mean Intersection over Union (mIOU) score of over 0.8 for disease segmentation.

**Machine Learning Engineer at DCube Tech.** Nov 2021 - Jan 2022

- Successfully integrated Kalman filters and NVIDIA DeepStream into the smart retail analytics system, resulting in accurate person re-identification and reliable customer tracking.
- Developed and trained a robust landmark detection model in caffe, significantly improving real-time video stream analysis.

**Machine Learning Engineer at Vyro.ai [Pvt] Ltd** Jun 2021 - Oct 2021

- Developed lightweight models under 15 MB for segmentation, super-resolution, photo-restoration, and enhancement tasks.
- Successfully reduced the memory requirement of a model from 1 GB to 400 MB, optimizing inference efficiency.
- Compiled, processed, and cleaned a large-scale data repository of over 100K images wrangling from online available sources for clothes segmentation task, ensuring data quality and accessibility.

## Publications

Malik, Asad Imtiaz et al. (Sept. 2023). "Multi-year Monitoring of Wheat Phenology and Effect of Climate Change in the South Asian Region using Sentinel-2 NDVI Time-Series Analysis". In: *SPIE Sensors + Imaging 2023*. URL: https://spie.org/spie-sensors-imaging/presentation/Multi-year-Monitoring-of-Wheat-Phenology-and-Effect-of-Climate/12733-28?SSO=1.

## Projects

**Crop Health Monitoring using Multi-Modal Remote Sensing Imagery** Github

- Led the Wheat Health Monitoring project, collecting and labeling satellite imagery data for 2000 acres and drone imagery data for 11 acres at NARC.
- Implemented the NDVI change detection algorithm using Pix4dmapper, Numpy, and Pandas to identify stressed areas in wheat crops.
- Developed and deployed a Streamlit-based web dashboard for tracking and analysis of wheat crop health and relevant climatic factors.

**Emotion based Music Generation** Github

- Trained ResNet 18 and ResNet 50 models on the Emotic dataset to extract Valence, Arousal and Dominance (VAD) scores achieving Mean Average Precision (mAP) of 0.27.
- Improved results by utilizing a 3D Swin Transformer pretrained on the Places365 dataset, achieving a higher mAP of 0.40.
- Generated MIDI music files from the associated VAD score using a pretrained Compound Transformer trained on the EMOPIA dataset, which were then converted to MP3 format.

**Smart Hans - The Mind Reading AI** Devpost Submission

- Developed an innovative project called "Smart Hans" inspired by the concept of "Clever Hans" that can detect irregular head movements (¡2mm) as a sign of accurately guessing a number a person is thinking of.
- Utilized pretrained models for head posture recognition and anomaly detection algorithms to analyze head movements and detect potential head jerks, laying the foundation for a fascinating "mind-reading" application.
- Recognized with the Prize for Interaction at the prestigious Super Artistic Artificial Intelligence Hackathon powered by TUM and KAUST for the outstanding achievement in developing Smart Hans.

**Pix2Pix GAN** Github

- Successfully implemented the Pix2Pix Generative Adversarial Network (GAN) paper for satellite to map image translation. While utilizing a Conditional GAN architecture and a Patch GAN discriminator.
- Trained the model for 25 epochs and achieved the reported accuracy mentioned in the paper for the cGAN model trained on cityscape photo→labels: Per-pixel accuracy of 0.28, Per-class accuracy of 0.22, and Class IOU (Intersection over Union) of 0.29.

## Honors and Achievements

2023 *2nd Best Adjudicated Industry Project Award*, **OPEN HOUSE 2023**
2021 *Prize for Interaction*, **SAAI (Super Artistic AI) Hackathon**
2021 *Winner*, **Infinity-21 Data Visualization Competition**