

Shahzaib Waseem

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Education

Masters in Computer Science – Simon Fraser University (SFU) Sept 2024

Thesis: “RipeTrack: Assessing Fruit Ripeness and Remaining Lifetime using Smartphones”

Teaching: Intro to CS and Programming 2, Software Engineering, Mobile Applications, Data Science

Bachelors in Computer Science – National University of Sciences and Technology (NUST) June 2020

Thesis: “ArtGAN: Generation and Analysis of Art using Machine Learning”

Experience

Machine Learning Research Assistant Sep 2021 – Sept 2024
NMSL Lab, SFU

- **Skills:** Deep Learning, Transformers, Hyperspectral Reconstruction, Mobile Development, PyTorch

RipeTrack [Code](#), [Android](#), [Demo](#)

- Designed a hyperspectral (HS) reconstruction model, using PyTorch, with spectral losses and model optimization to outperform state-of-the-art (3.5% better RMSE) with a 67-97% faster runtime on smartphones (*RipeTrack*)
- Based on estimated chemical composition, RipeTrack identifies fruit ripeness level with an accuracy of over 93%
- Captured dataset on a \$30,000 HS camera for tracking the ripening process of fruits based on chemical changes
- Used YOLO object detection models to upscale the region of interest, a 472 times reduction in processing time

MobiSpectral [Code](#), [Android](#), [Demo](#)

- Designed a transformer model to upscale images to HS bands to estimate chemical composition (*MobiSpectral*)
- The downstream application for MobiSpectral was an HS classification model with 92% mean accuracy
- Integrated white balancing model to convert all illumination to a standard one, increasing accuracy by 6%
- Deployed models on Android apps for RipeTrack and MobiSpectral, with 96% accuracy on smartphones

Software Engineer Jun 2020 – Jul 2021
Cognitive Healthcare International (CHI)

- **Skills:** Unsupervised Clustering, Computer Vision, Android
- Deployed a face auth model in the production app, making the system secure and reduced login time by 60%
- Integrated a model for diabetic retinopathy on custom patient dataset, early diagnosing 100+ diabetic patients
- Collaborated with business analysts and project managers, to translate business requirements into ML solutions
- Developed APIs for tele-health app by working with backend and hardware teams, with 40% faster deployments
- Managed code with Git and Travis CI for timely feature delivery, improving deployment efficiency by 20%
- Conducted workshops to explain the face authentication process to the marketing team and get feedback

Machine Learning Intern Jun 2019 – Sep 2019
Furnwish

- **Skills:** 3D Upscaling, Augmented Reality, Apple, PyTorch
- Enhanced user engagement by designing an immersive furniture shopping experience on Apple AR-Kit
- Deployed a CNN to upscale furniture images to 3D models, increasing page session time by 23% on the portal
- Led a team of three engineers to ensure timely project completion within a 3-month deadline by streamlining workflows and enhancing collaboration by introducing Slack and Atlassian Jira

Machine Learning Research Assistant Jun 2018 – Jun 2020
Cognet Lab, NUST

- **Skills:** GANs (W-GAN, DC-GAN, Fast-SRGAN), Optimization, TensorFlow
- Created a set of generative adversarial networks to generate over 1000 images of architecture and paintings
- Used image synthesis techniques – glitching, watermarking – for a 40% reduced complexity with high fidelity

Projects

- Badger: Sentiment analysis to predict market index with time series tweets, news, and stock prices with 5% error
- Ship Detector: Ranked 3rd on a Kaggle leaderboard for instance segmentation challenge using Masked R-CNN
- CORD Analysis: A Natural Language Processing (NLP) project, where COVID-19 literature was organized by extracting topics and keywords, clustering them based on relevance and similarity
- PDF-GPT: A GPT based chatbot which employs Retrieval Augmented Generation (RAG) by using content from PDFs as knowledge base. Used RASCEF prompt engineering framework to answer domain specific questions
- Edumeet: Campus-wide portal for students to search for jobs, seminars, news, and connect with alumni, etc

Publications

- RipeTrack: Assessing Fruit Ripeness and Remaining Lifetime using Smartphones. *Under Review*
- MobiSpectral: Hyperspectral Imaging on Mobile Devices. *MobiCom*, Oct 2023

Skills (GitHub)

Languages: Python, C, C++, SQL, Android, Git, Docker, Linux/Unix, Shell, Jupyter, Chroma DB

Data and ML: Power BI, Azure, OpenCV, scikit-learn, pandas, NumPy, NLTK, CUDA, TensorFlow, PyTorch, LLMs

Honors and Awards

SFU – School of CS, <i>Received full funding for the duration of my Masters degree at SFU</i>	2021 – 24
AIESEC Fellow, <i>Selected for AIESEC summer research fellowship in Egypt</i>	2019
NUST – Dean's List, <i>Received NUST-SEECs Dean's Scholarship multiple times</i>	2016 – 20

References

Prof. Mohamed Hefeeda – Professor and Director CS, Simon Fraser University – mhefeeda@sfu.ca

Prof. Syed Taha Ali – Assistant Professor, National University of Sciences and Technology – taha.ali@seecs.edu.pk

Ahmad Amin – Co-Founder and Chief Technology Officer (CTO), Furnwish – a.amin@furnwish.net