

# Shahzaib Waseem

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## Education

**Simon Fraser University (SFU)** – M.S. in Computer Science 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.

**National University of Sciences and Technology (NUST)** – B.S. in Computer Science June 2020

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

## Experience

**Graduate Research Assistant** *Simon Fraser University (SFU)* Sep 2021 – Aug 2024

- **Skills:** Hyperspectral Reconstruction, Transformers, Near Infrared, Mobile Devices, PyTorch.

### *RipeTrack*

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

- Designed a hyperspectral (HS) reconstruction model, with spectral losses and model trimming 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 object detection models to upscale only the region of interest, a 472 times reduction in processing time.

### *MobiSpectral*

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

- Designed a reconstruction model to upscale images to HS bands to estimate chemical composition ([MobiCom](#)).
- The downstream application for MobiSpectral was a HS classification model with 92% mean accuracy.
- Standardized illumination using a white balancing model for real-life diversely illuminated images.
- Implemented Android apps for MobiSpectral and RipeTrack to run on phones with 90% accuracy in the wild.

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

- **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 model for diabetic retinopathy on a custom patients’ dataset, early diagnosing 100+ diabetic patients.
- Collaborated with business analysts and project managers, to translate business requirements into ML solutions.
- Developed and maintained APIs in tele-health android app, by coordinating with the UI and backend teams.
- 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** *Furnwish* Jun 2019 – Sep 2019

- **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.

**Research Assistant** *Cognet Lab* Jun 2018 – Jun 2020

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

## Projects

- [Badger](#): A sentiment analysis model to predict market index with time-series tweets, news, and stock prices.
- [Ship Detector](#): Optimized UNET, with transfer learning and digital signal processing to improve accuracy by 1%.
- [COVID Literature Analysis](#): Clustered keywords and topics from COVID-19 literature based on similarity and relevance for making broader analysis about the content and make searching efficient.
- [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

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

## Skills ([GitHub](#))

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

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

## Honors and Awards

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2021 – 23 **SFU – School of CS**, Received full funding for the duration of my Master's degree at SFU.

2019 **AIESEC Fellow**, Selected for AIESEC summer research fellowship in Egypt.

2016 – 20 **NUST – Dean's List**, Received NUST-SEECs Dean's Scholarship multiple times.

## References

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Prof. Mohamed Hefeeda – Professor and Director CS, Simon Fraser University – [mhefeeda@sfu.ca](mailto:mhefeeda@sfu.ca)

Prof. Syed Taha Ali – Assistant Professor, National University of Sciences and Technology – [taha.ali@seecs.edu.pk](mailto:taha.ali@seecs.edu.pk)

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