TIANSHU KUAI

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EDUCATION

University of Toronto Sept. 2017 - Apr. 2022
BASc Engineering Science - Robotics Major , Artificial Intelligence Minor 2022
Major GPA: 3.77/4.0, Cumulative GPA: 3.73/4.0
Dean's Honours List for all Academic Semesters

SKILLS

PROGRAMMING SKILLS: Python, C/C++, Pytorch, TensorFlow, ONNX, MATLAB, PostgreSQL, ROS, Verilog, Docker, Git, Latex
LANGUAGES: English, Mandarin

EXPERIENCE

Toronto Robotics and Artificial Intelligence Laboratory, *Undergraduate Research Assistant* May 2021 - Current
- Thesis on improving feature learning processes for more robust feature extraction and more accurate bounding box refinement for 3D Object Detectors supervised by Prof. Steven Waslander
- Research on LiDAR point clouds 3D Object Detection Models

aUToronto, *Computer Vision Engineer* July 2021 - Current
- Research on efficient 3D perception algorithms and models
- Worked collaboratively on deploying real-time perception models on autonomous vehicles

Qualcomm, *Machine Learning Research Intern* May 2020 - May 2021
- Research on Audio related deep learning models
- Research on state-of-the-art methods for Neural Network Compression
- Building conversion pipelines between different ML frameworks such as Pytorch, ONNX, TF, TF LITE
- Working on NPU software compiler pipeline development

University of Toronto, *Undergraduate Research Assistant* May 2019 - Aug. 2019
- Research on Early Relapse Detection in Youth Depression using Machine Learning Models supervised by Prof. Deepa Kundur
- Worked on patients' data processing and imputations
- Developed preliminary pipeline to track patients' facial expressions for facial behaviour analysis

PROJECTS

Deep Learning Based COVID-19 Diagnosis Tool July 2020 - Aug. 2020
- A finetuned ResNet18 for COVID-19 diagnosis based on Lung CT scan
- Finetuned U-net for labelling the infection area on raw CT scan for COVID-19 Positive patients
- Great potential to be a commercial software product for hospitals where COVID-19 Test Kits are unavailable

Real Time Audio Denoiser Aug. 2020 - Current
- A deep learning model with a symmetric encoder-decoder architecture built using convolutional layers and skip connections
- Model taking in Short-Time Fourier Transform (STFT) of the noisy signal as input, and producing the clean signal's STFT, which can be converted back to waveform as the final output
- Achieved good performance on various types of noise while maintaining the number of parameters small (~33K)

Autonomous Ball Dispensing Mobile Machine Jan. 2019 - Apr. 2019
- Started from literature, market, and idea survey, through professional engineering decision-making tools to successfully converge to a fully autonomous ball dispensing machine prototype
- The prototype uses PIC18F4620 with MPLAB X and Arduino Nano to enable movement, real-time clock, user Interface, and IR Remote Control.
- This prototyped product can potentially be used for automatic delivery and dispensing in warehouses as well as other related industries

AWARDS

University of Toronto Engineering Competition Jan. 2020
Awarded second prize in senior design competition

NSERC Undergraduate Student Research Award (NSERC-USRA) Apr. 2019
Awarded to undergraduate science and engineering students based on research aptitude

University of Toronto Excellence Award (UTEA) Mar. 2019
Awarded to University of Toronto students based on research aptitude