Shiqi(Alex) Tan

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Education

University of Toronto **Begins September 2024**
Computer Engineering, Master of Engineering *Toronto, Canada*

University of Toronto **September 2019 – June 2024**
Computer Engineering, Bachelor of Applied Science with Honours | cGPA: 3.6 *Toronto, Canada*

- **Dean's Honours List**: Fall 2019, Winter 2020, Fall 2020, Winter 2021, Winter 2022, Fall 2023, Winter 2024

Research Interests

Deep Neural Networks, LiDAR Segmentation and Detection, Autonomous Vehicle, Scene Understanding, Scene Reconstruction, Sensor Fusion, Image Synthesis, 3D Geometry

Publications

Yuangan Zou, Xinpeng Shan, **Shiqi Tan** and Shurui Zhou. Can We Do Better with What We Have Done? Unveiling the Potential of ML Pipeline in Notebooks. ICSME 2024

Shiqi Tan*, Hamidreza Fazlali*, Yixuan Xu, Yuan Ren, and Bingbing Liu. Uplifting Range-View-based 3D Semantic Segmentation in Real-Time with Multi-Sensor Fusion. ICRA 2024

Patents

Hamidreza Fazlali, **Shiqi Tan**, Yixuan Xu, and Bingbing Liu. Semantic Segmentation of Point Clouds using Confidence-based Adaptive Feature Aggregation and 3D Neighborhood Feature Augmentation. *US Patent Filed*

Professional Experience

Huawei Technologies Canada, Noah's Ark Lab **May 2022 – August 2023**
Assistant Researcher *Markham, Canada*
Supervised by Dr. Bingbing Liu

- Researched relevant methods in the field of computer vision and machine perception for autonomous driving. Areas of interest include semantic segmentation, object detection, occupancy prediction, and scene reconstruction.
- Designed and implemented 5 real-time deep learning models for semantic segmentation to be deployed.
- Reduced latency of online LiDAR semantic segmentation pipeline by 200%.
- Achieved state-of-the-art semantic segmentation results on public datasets and submitted a research paper to a peer-reviewed conference as the co-first author.

Tencent, Cloud and Smart Industries Group **June 2021 – August 2021**
Software Development Engineer in Test *Shenzhen, China*

- Cooperated on constructing an automated testing suite based on Django REST Framework.
- Implemented APIs that initiate the auto-testing by extracting data from 3000+ entries across 4 schemas.
- Developed fundamental package for running auto-tests on applications created with Cocos2D-X engine. Encapsulated functions from the Cocos engine as well as Airtest framework for controlling virtual devices.
- Wrote 20+ scripts across 4 categories of activities. Incorporated various execution logics for functionality testing.

Bank of Montreal, BMO Capital Markets **May 2020 – August 2020**
Data Analyst *Toronto, Canada*

- Developed SQL query test cases to ensure accurate and precise data migration.
- Executed 70+ test cases and analyzed result data from 3 schemas in both database environments.
- Compiled test outcome and reported critical issues, achieving 98% data accuracy.

Leadership / Extracurricular

University of Toronto, **Department of Computer Science** **Jun 2024 – Present**
Student Researcher *Toronto, Canada*
Supervised by Prof. Igor Gilitschenski

- Investigated knowledge distillation methods on LLMs and transformer architectures in classification tasks with an emphasis on computational efficiency.
- Conducted inference on language classification tasks with tools such as vLLM and OpenAI-like APIs.

University of Toronto, **Department of Electrical and Computer Engineering** **Fall 2023 – Summer 2024**
Undergraduate Researcher *Toronto, Canada*
Supervised by Prof. Shurui Zhou

- Researched software engineering practices of data scientists in terms of machine learning workflow choices.
- Conducted experiment across Kaggle notebooks with AutoML to validate hypothesis.
- Led literature review in the software engineering area to analyze and investigate related works.

aUToronto, **3D Object Detection Team** **Fall 2023 – Winter 2024**
Team Member *Toronto, Canada*

- Investigated deep learning methods of LiDAR object detection and panoptic segmentation on unlabeled data.
- Implementatd visualization pipeline to diagnose model performance with temporal aggregation.

Technical Skills

Languages: Python, C/C++, SQL, HTML/CSS, JavaScript, Bash, CUDA, Java, Verilog, MATLAB
Tools: Git, Docker, Linux, VS Code, Kaggle, ROS, Android Studio
Frameworks/Libraries: Pytorch, Keras, OpenCV, NumPy, Pandas, Matplotlib, Open3D, Django, Flask

Projects

SmartSwim Open Water Wayfinder | *Java, Android Studio, Augmented Reality* **April 2024**
Supervised by Prof. Steve Mann

- Designed an augmented reality application that helps users to safely navigate open waters.
- Developed a phone server and a goggles client that established a data channel.

Face2Face | *Python, Pytorch, OpenCV, Matplotlib* **April 2022**

- Designed an emotion detection model using images of faces based on CNN.
- Implemented a real-time inference script on Google Colab that runs on a webcam stream.

AT&A Maps | *C++, OpenStreetMaps, GTK Toolkit* **December 2020**

- Extracted geographical features and data from OpenStreetMaps. Used GTK toolbox to design user interface.
- Designed algorithms such as pathfinding and collision detection for image icons, as well as a non-standard version of the travelling salesman problem.

iApplyAR | *Unity, echoAR* **November 2020**

- Created interactive AR educational software for NewHacks 2020 Hackathon using echoAR and Unity, received "Best AR/VR Application" award.
- Included build instructions for furniture, possible applications include electronics repair guide, etc.