

Pedram Agand

Research assistant at MARS lab, SFU – BC – Canada

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Education

Simon Fraser University (SFU) (GPA: 4.08/4.33) **Burnaby, Canada**
Ph.D. of computer science [Mo Chen, Angelica Lim] *Sep 2019 – (Expected) Dec 2024*
Time series analysis, Vision transformers, Autonomous driving, Offline deep reinforcement learning.

Simon Fraser University (SFU) (GPA: 4.13/4.33) **Burnaby, Canada**
M.Sc. of computer science [Mo Chen, Angelica Lim] *Sep 2019 – Aug 2021*
Thesis: [From Estimation to Control for Robotic Navigation: Probabilistic and Optimal Approaches](#)

K. N. Tossi University (GPA: 3.91/4) **Tehran, Iran**
M.Sc. of electrical engineering [Hamid D. Taghirad, Ali Khali-sedigh] *Sep 2014- Jan 2017*
Thesis: [Control architecture based on environment impedance in Teleoperated system in Bayesian paradigm](#)

K. N. Tossi University (GPA: 3.89/4) **Tehran, Iran**
B.Sc. of electrical engineering [Hamid D. Taghirad] *Sep 2010- Aug 2014*
Thesis: [Implementation and control of Minimally Invasion Eye Surgery Parallelogram Robot](#)

Recent publications

[\[See full list\]](#)

[Sequential Modeling of Complex Marine Navigation: Case Study on a Passenger Vessel](#)

Yimeng Fan*, Pedram Agand*, Mo Chen, Edward J Park, Allison Kennedy and Chanwoo Bae **AAAI 2024**
Developing a time series forecasting model with real-world data using a transformer architecture and creating a gym environment and dataset compatible with D4RL's offline dataset.

[Fuel Consumption Prediction for a Ferry using ML and in-service Data](#) **Ocean Eng. 2023**
Pedram Agand, Allison Kennedy, Trevor Harris, Chanwoo Bae, Mo Chen, and Edward J. Park
Comparison of fuel consumption models for west coast Canada vessel.

[DRL Traffic Signal Controls with Optimized CO2 emissions](#) **IROS 2023**
Pedram Agand, Alexey Iskov, and Mo Chen
Prioritize road users based on their fuel efficiency to enhance overall travel time and CO2 emission.

[Online Probabilistic Model Identification using Adaptive Recursive MCMC](#) **IJCNN 2023**
Pedram Agand, Mo Chen, and Hamid D. Taghirad
Variable jump policy with temporal forgetting factor to estimate pdf in hybrid models.

[Human Navigational Intent Inference with Probabilistic and Optimal Approaches](#) **ICRA 2022**
Pedram Agand, Mahdi Taher Ahmadi, Angelica Lim, and Mo Chen
Noisily rational model of human behaviour with recursively and continuously update via Bayesian.

[Adaptive model learning of NN with UUB stability for robot dynamic estimation](#) **IJCNN 2019**
Pedram Agand, and Mehdi A. Shoorehdeli
Parallel self-driving NN based on continuous Lyapunov function for online robot identification.

Technical skills

- **Sci. Computing:** Pytorch, TensorFlow, MATLAB, Azure, OpenCV, CUDA, Jupyter notebook.
- **Web Programming:** Flask, HTML, CMS, CSS, SQL.
- **General Development:** Python, C&C++.
- **Other:** ADSL, Unix, Docker, GitHub, L^AT_EX.

Professional experience

Internship at Borealis AI

Sep-Dec 2022

Machine learning researcher [supervised by Keyi Tang]

- Research: Estimating density ratio via attention-based network and propensity score estimator.
- Engineering: Pipeline, CI/CD, Nvidia cluster, WandB, ML flow, Slurm, CR/PR, Unit test, Pytorch.

Part-time R&D at Canada Research Chairs (CRC)

May 2022- now

Machine learning engineer [directed by Dr Tenzin Doleck]

- Recommendation system to provide AI-enhanced feedback for learning, based on collaborative filtering.
- Engineering: Prototype, Flask/Django/SQL, MLAAS, Streamlit, LLM/ChatGPT API, data analysis([GitHub](#)).

Joint project SFU and National Research Council of Canada(NRC)

Sep 2021- now

Research assistance [supervised by Allison Kennedy, Chanwoo Bae , Harris Trevor]

- From preprocessing (dimension reduction, data analysis) to modeling, prediction, and optimization of navigational practice in BC ferry vessel using deep network and non-parametric ensemble technique ([GitHub](#)).

Internship at Breeze traffic

Apr-Aug 2021

Machine learning researcher [supervised by Alexey Iskov, and Alexander Kurtynin]

- Developing reward shaping DRL framework for traffic signal control to reduce carbon dioxide ([GitHub](#)).

Joint project SFU and Huawei

Jan 2020-Nov 2020

Research Assistance [supervised by Dr Zhan Xu, Daesik Jang]

- Human navigational intent prediction using probabilistic and optimal approaches ([GitHub](#)).

Highlighted projects

Distilled Multi-Task Learning for Transformer-Based Sensor Fusion

(Submitted) IROS 2024

DMFuser combines knowledge from single-task teachers to integrate multiple RGB-D cameras for perception (semantic segmentation and depth cloud). It generates vehicular navigational commands using an attention-CNN network and utilizes a coarse simulator for both static and dynamic environments in Carla ([Github](#)).

DMODE: Differential Monocular Object Distance Estimation

(Submitted) ROMOCO 2024

Pedram Agand, Michael Chang, and Mo. Chen

Estimating the object's distance by sensor fusion that consolidate analytic solution, alternation in an object's size over time, and camera motion captured via a single camera and IMU.

LeTFuser for Autonomous Driving with Multi-Task Learning

CVPR-VCAD 2023

Pedram Agand, Mohammad Mahdavian, Manolis Savva, and Mo Chen

Light-weight End-to-end Transformer-Based Sensor Fusion: Multi-modal fusion transformer to integrate visionary and depth inputs to generate semantic depth cloud in Carla environment.

EcoLight: Reward Shaping in DRL for Environment Friendly Traffic Control

NeurIPS-w 2021

Pedram Agand, Alexey Iskov, and Mo Chen

Reward shaping scheme for various RL methods that reduces CO2 emissions in addition to total travel time that was presented in tackling climate change with machine learning workshop.

Honors and awards

- CS Research Day Award third place in the poster presentation for [DMODE](#) paper 2022
- Graduate Fellowship full scholarship for 4 years from SFU applied science 2019-2023
- Entrance scholarship 10,000 CAD from graduate dean SFU 2019
- Elite foundation of Iran membership privilege for exceptional talented graduate students 2017
- Best researcher award from university dean among M.Sc. degree students. 2017
- Best paper Award for oral presentation [particle filters](#) paper 2016
- Direct admission for M.Sc. in K. N. Toosi without university entrance 2014
- Top Rank ranked 3th in control major and 5th in whole ECE faculty 2014