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# Hossameldin Mohammed

## Summary


- Machine learning engineer with 5 years of experience in developing and deploying deep learning algorithms
- Interested in solving a wide range of problems including natural language processing/understanding, handwriting recognition and computer vision
- Enthusiast in building and automating machine learning workflows
- Possessing quality research skills translating to being well-read on state-of-the-art deep learning research and machine learning theory


## Skills

Python, C++, Java, Bash, Tensorflow, Pytorch, CUDA, Docker, Kubernetes, Kubeflow

## Experience

**Sunia Technology Inc.** — Burnaby, BC, Canada
Machine Learning Engineer — Mar 2022-Present
Projects:S

- Touch Screen Gesture Recognition using a CRNN framework
- Online handwriting recognition using sequence-to-sequence autoencoders (improved accuracy from 60% to 96% for over 60 languages)
- Off-line handwritten mathematical expression recognition using transformers (improved accuracy from 55% to 78% using data augmentation and advanced modeling techniques)
- Touch screen stylus latency recognition using GRU-CNN framework
- Image matting using modified YOLO and U2NET frameworks
- Off-line signature fraud identification system using dynamic signature synthesis and verification (SynSig2Vec)
- Touch Screen Virtual Keyboard (early research stage)

**Loxz Digital** — Berkeley, CA, USA (Remote)
Machine Learning Engineer — Sep 2021-Mar 2022

- Building an Email Recommendation Engine that includes image, sentiment analysis, word count, send-time and quantitative prediction and optimization

**British Columbia Institute of Technology** — Burnaby, BC, Canada
Adjunct Faculty — Dec 2021-Jun 2022
Teaching Engineering courses

**University of British Columbia** — Vancouver, BC, Canada
Research Assistant — Jan 2017-Sep 2021
Projects:

- Detection and filtering of sun glare in autonomous vehicle sensors
- Generative modeling of cyclists in off-street paths using LSTIM-based Variational Autoencoders
- Clustering of cyclist following and overtaking stages using mixed mixture modeling
- Collaboration in the development of BITSAFS Traffic Intelligence (TI) software for computer vision-based traffic analysis

**SETS Intl.** Cairo, Egypt
Data Scientist Nov 2014-Dec 2016
Projects:

- Towards wise cities: A data-driven approach for sustainable mobility
- Traffic management program for the city of Riyadh, KSA
- Building a database management system for data warehousing and retrieval for the Ministry of Transportation in Cairo, Egypt
- Truck Sampling and portable emission measurement for modeling Cairo transportation emissions phase II
- Building a longitudinal cohort study for transportation demand time series data collected at the city of Riyadh, KSA

**Cairo University** Cairo, Egypt
Research Assistant Sep 2012-Dec 2016
Conducting research on modeling and simulation of transportation systems

## Education

**University of British Columbia** Vancouver, BC, Canada
PhD in Engineering Jan 2017-Present
(currently part-time)

Thesis: "Imitation learning agent-based microscopic simulation of bicycle traffic"

**Cairo University** Cairo, Egypt
Master of Science in Engineering Sep2012-Dec2016
Thesis: "A bi-level approach for calibrating a mesoscopic traffic simulation model of Greater Cairo Region"

**Cairo University** Cairo, Egypt
Bachelor of Science in Engineering Sep2007-May 2012

## Selected Publications

2021 Mohammed, H., Sayed, T., Bigazzi, A. Y. Microscopic modeling of cyclists on off-street paths: A stochastic imitation learning approach, Transportmetrica A: Transport Science, DOI: 10.1080/23249935.2020.1870178s.

2019 Mohammed, H., Bigazzi, A. Y., Sayed, T. Unconstrained Cyclist Trajectory Simulation for Agent-Based Models. 54th Annual Conference of the Canadian Transportation Research Forum, Vancouver, BC, Canada.

2019 Mohammed, H., Sayed, T., Bigazzi, A. Y. Toward Agent-based Microsimulation of Cyclist Following Behavior: Estimation of Reward Function Parameters Using Inverse Reinforcement Learning (No. 19-03431).

2018 Mohammed, H., Bigazzi, A. Y., Sayed, T. Characterization of bicycle following and overtaking maneuvers on cycling paths. Transportation research part C: emerging technologies, 98, 139-151.

## Awards

2021 Statistical Society of Canada (SSC) Annual Meeting, First place winner of the 2021 Case Studies in data analysis competition - Modeling COVID-19 disease dynamics in Canada

2020 University of British Columbia, President's Academic Excellence Initiative PhD Award

2017 University of British Columbia, International Tuition Award

2012 Cairo University, Master Degree Fellowship