Mostafa **Mohsen**

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Highlights

- **Data Scientist - Computer Vision** @ IBM
- **Deep Learning Specialization** - Andrew NG.
- **ML Tutorial Leader** - AI Society Exec.
- **Embedded AI** - Nvidia Jetson Platforms
- **Computer Vision Lead** - Mars Rover
- **Hackathon Wins** - DeltaHacks

Education

Software Engineering Co-op - GPA 3.7 - Golden Key (top 15%) *2017 - 2022*

McMaster University - Bachelor of Engineering *Hamilton ON*

- **Coursework:** Software Design & Concurrency **(A+)** Data Structures & Algorithms **(A-)** Software PM **(A+)** SE Theory To Prac **(A)** Engineering Computation **(A+)** Signals & Systems **(A+)** Linear Optimization **(A-)** Digital Systems & Interfacing **(A)** Software Testing **(A+)**
- **Sports:** Ultimate Frisbee Intramural League

Deep Learning Specialization - *deeplearning.ai* *Summer - 2019*

- **Coursework:** Convolutional Neural Nets *(A+)* Tuning, Regularization & Optimization *(A+)* Structuring ML Projects *(A+)* Deep Neural Nets *(A+)*

Computer Vision & SLAM *June - 2020*

- **Advanced CV - Udemy:** Greedy Layer-wise pre-training, Optical Flow, VGG, ResNet, Inception
- **SLAM - Cyrill Stachniss:** EKF SLAM, UKF SLAM, EIF SLAM, SEIF SLAM, Particle Filters & MCL, & more - *GitHub*

Skills

- **Languages:** Python, C, C++, CUDA-C++, Go, Java, Bash, Swift, NASM
- **Frameworks/Tools:** TensorRT, PyTorch, Keras, Docker, ZeroMQ OpenCV, CUDNN, Gstreamer, ONNX, Git, ROS
- **Cloud Technologies:** Spark, Data Bricks, Azure ML, Azure Data Factory, Azure Data Lake Storage
- **Nvidia Platforms:** Jetson Xavier NX, Jetson TX2

Experience

IBM *120 Bloor St E, Toronto, ON*

Data Science Intern - Computer Vision *Jan 2021 - Apr 2021*

- Technical research report in optimizing CV models using TensorRT; Detectron, Yolov5, Mask R-CNN, EfficientNet, EfficientDet, GoogLeNet
- Developing MEC (Multi-Access Edge Computing) POC for model inference and analyzing latency vs cloud latency

TD Canada Trust *66 Wellington St W, Toronto, ON*

Enterprise Data Architect Intern - A.I. Platforms *May 2020 - Aug 2020*

- Outlined and documented PySpark framework - Job Scheduling; Monitoring & Integration, ETL Process; Execution & Exception Handling
- Enhanced enterprise data architecture solutions supporting A.I. platforms - POC's on new technologies

Projects

Custom YoloV4 & Bench-marking DLA Inference Engines - *GitHub* - *Medium* *Jul. 2020*

- Training YoloV4 (PyTorch) on custom data set, exported to ONNX format, generated inference engines using TensorRT on Nvidia Jetson Xavier - inference on Deep Learning Accelerators and GPU; 60 QPS throughput on volta GPU + 48 tensor cores *Personal Project*

Connected Autonomous Vehicles | 1st Place @ Hackathon - *GitHub*- *DevPost* *Jan. 2020*

- Reducing need for a large visual radius on an AV decreases engineering costs while increasing safety, redundancy, reliability *4 Person Project*
- Using stationary sensors to assess conditions. Sending warnings/protocols; dynamic speed limits, ice/snow detection, left turn traffic indicator.

Optimized MNIST Model - From Scratch - *GitHub* *Aug. 2019*

- Designed and trained an NN model for MNIST and accelerated gradient descent with hand written optimization algorithms *Personal Project*
- Manually implemented; Momentum, RMSProp, Adam optimization, with mini batch GD & batch GD - 96% test accuracy

Low-Level Convolution - CUDA-C++ & CUDNN - *GitHub* *Jul. 2020*

- 4-kernel edge detecting Cross Correlation with CUDNN in CUDA-C++, which allows for greater control over host (CPU) and device (GPU) resources, and control over the time/space trade-off of parallelising programs. *Personal Project*

Extra Curriculars

Workshops and Talks organizer - *My Computer Vision Talk* *Sep. 2020 - current*

Google DSC *McMaster Univ*

- Organizing workshops and talks about anything Dev or Tech related, attracting more students to expand their skill set

Machine Learning Executive Tutorial Leader *Sep. 2019 - May 2020*

McMaster Artificial Intelligence Society *McMaster Univ*

- Delivering ML/DL tutorials including theories, concepts and crafted walkthroughs to anybody willing to learn
- Material covered: DNN's, Grad. Descent, Hyper-param tuning, Bias & Varience trade-off, optimization algorithms, Normalization

Computer Vision Lead *Oct. 2019 - May 2020*

McMaster Mars Rover Team *McMaster Univ*

- Developing CV system on Nvidia Jetson TX2 - A.I. computing platform using ROS; Path planning, Object detection, Aruco marker detection