OMAR ABID

Machine Learning Engineer & Researcher | Computer Vision

linkedIn.com/in/omarabid4/ github.com/omarabid59 omar-abid.ca
C: +1 647 702 1668 | omar.abid4@gmail.com

HIGHLIGHTS & OBJECTIVE

- **Career Objective:** Apply my passion as a Machine Learning Engineer / Data Scientist to solve real-world problems that make a positive impact to others. Some of the industries I am interested in include diagnostic imaging, surgical robots and finance.
- 4 years' experience designing, building and deploying Machine Learning algorithms. Experience applying 2D and 3D computer vision algorithms to images and video for object detection, tracking and mapping
- 3 years' experience with software development, version control, unit testing and CI/CD
- 4 years' experience in research methods, statistics, physics, biology, technical writing and teaching

EDUCATION

Year	Degree & Institution	GPA
2018	MSc, Computer Science & Engineering, *York University* Thesis on Machine Learning and Computer Vision	3.9/4.0
2014	Honors BSc, Biophysics, *York University*	3.7/4.0

SKILLS & KNOWLEDGE

Programming Languages	C/C++, Python, Java, Bash, MATLAB, JavaScript, SQL
Machine Learning	Neural Networks, SVMs, kNNs, Decision Trees, Logistic Regression, Autoencoders
Cloud Services	GCP, AWS, Azure
Frameworks	Tensorflow, PyTorch, scikit-learn, NumPy, Pandas, OpenCV, ROS, PCL, CoreNLP
Computer Vision	OCR, 2D object detection, segmentation and tracking. 3D object detection with SfM & SLAM
Predictive modeling	Deep learning, CNNs, LSTM RNNs, supervised and unsupervised classification, Bayesian statistics

EXPERIENCE

2018 – 2019 **Data Scientist at Watopedia** (DIFC, Dubai, U.A.E)

- Designed and implemented large scale machine learning models to identify security threats in the transportation sector [Project 1 - 5]
- Deployed software to Google Cloud leading to substantial gains in investment capital

2016 – 2017 **Teaching Assistant at York University** (Toronto, ON)

Invigilated and graded exams and labs for first to third year undergraduate computer science students. Worked with robotics, mobile app development and software design. Directed the labs and office hours for the following courses:

- *Fall 2016 | EECS 1011:* Computational Thinking Through Mechatronics
- *Winter 2016 | EECS 1570:* Introduction to Computing for Psychology
- *Winter 2016 | EECS 3311:* Software Design
- *Summer 2016 | EECS 3301:* Programming Language Fundamentals

2015 – 2018 **Computer Vision Researcher at York University** (Toronto, ON)

Improved the efficiency and eliminated bugs on a proprietary neural network simulator implemented in C++ resulting in a more stable system for experimental research purposes

2013 – 2014 **Research Assistant at York University** (Toronto, ON)

- *Hardware Engineer (10/2013 – 04/2014):* Engineered an electronic circuit for reliable measurement of biological cell electric potentials [Project 6]
- *Data Analyst (04/2013 – 08/2014):* Statistical data analysis of EEG of Macaque Monkeys for neural population decoding [Project 7]
- *Data Analyst (10/2013 – 08/2014):* Statistical data analysis of human behavioral data to infer differences in learning strategies among patients.

2012 – 2013 **Software Developer Associate at York University** (Toronto, ON)

Recommended and collaborated on the design and implement software interface and communication systems for York University's Rover Team using C++ and Python.

PROJECTS

- Designed and developed a **data processing pipeline** for collecting, cleaning and augmenting large datasets. Maintained software packages with **git** resulting in rapid development of machine learning models. [Project 1]
- A surveillance system for automatic **real time object detection** and notification of threats (suspicious behaviors and objects of interest) in security critical environments using **Deep Learning**. Improved effectiveness of clients by allowing quick searching of surveillance video by object type, color, location or time. [Project 2]
- Developed a robust **face recognition pipeline** in Python using **Tensorflow**. Resulted in a state-of-the art system that provided real-time security deployment to company clients. Also engineered an algorithm to add new, previously unseen faces to the **SQL database** for seamlessly updating identities. [Project 3]
- Programmed and tuned machine learning models in **Kera's** using different base **CNN architectures** (e.g. SSD, Faster R-CNN, YOLOv3) to iteratively tune and select the best model leading to a robust and reliable system for **dangerous object detection** (benchmark: mAP @.75: 60, performance: 100 fps). [Project 4]
- Preliminary development of a **vehicle and license plate recognition pipeline** allowing clients to easily record statistics of vehicles in a controlled environment (benchmark: License plate detection AP @ 0.75: 71, License plate accuracy: 95%, Performance: 30 fps). [Project 5]
- Designed and implemented a **hand tracking and hand gesture classification system** as an adjunct to a computer mouse [See GitHub]
  - Applied low level **image processing algorithms** (e.g. color segmentation, HOG, SIFT feature extraction) for reliably segmenting hand from background
  - Applied **Kalman Filter** for smooth tracking leading to a system robust to camera sensor noise
- Planned the design and developed an **electronic circuit** for current-voltage measurements leading to a system which could reliably measure biological cells electrical potential for research purposes. [Project 6]
- Analyzed **EEG data** of Macaque monkeys using **MATLAB's Statistics and Machine Learning Toolbox**. An **SVM** model was developed that indicated differences in EEG activations under different task conditions leading to key research insights for future work in the lab. [Project 7]
- Machine Learning on the cloud with **Google Cloud Platform** for object detection with **WebRTC**, built in Python. [See GitHub]
- **Convolutional Neural Network** layer **visualization** in real time with TensorFlow's object detection API. [See GitHub]
- **Deep Learning based object tracking** in real time with TensorFlow's object detection API. [See GitHub]

RELEVANT COURSES

Master's Level	Data Mining, Advanced Topics in Computer Vision, Design and Analysis of Algorithms, Software Design, Data Structures
Bachelor's Level	Multivariate and vector calculus, linear algebra, experimental physics with data analysis, statistics, electronics
Coursera Specialization	Data Engineering on Google Cloud Platform Recommendation Systems with TensorFlow on GCP

PUBLICATIONS

Master's Thesis (2019) Cognitive Programs Memory: A framework for integrating control in STAR, York University

Sengupta, R., Abid, O., Bachoo, A., & Tsotsos, J. (2017). Attentional blink as a product of attentional control signals: A computational investigation. Journal of Vision, 17(10), 1197-1197.