

OMAR ABID

DATA SCIENTIST | Machine Learning | Computer Vision

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SUMMARY

BSc degree in Biophysics and MSc in Computer Science specializing in Computer Vision. Through my training I've acquired knowledge and experience in the domains of machine learning with a focus on computer vision from both a computational and neuroscience perspective. My research background has allowed me to take a methodological approach to solving problems and this has allowed me to work with a high degree of productivity. I am a highly motivated individual looking to build my career while continuing to learn and deliver projects with value.

EDUCATION

Master of Science: (MSc) Computer Science 2018
York University — Toronto, ON, Canada
Area of Focus: Active and Attentive Vision in Computational Neuroscience.

Bachelor of Science (H.BSc) H. Biophysics 2014
York University — Toronto, ON, Canada

TECHNICAL SKILLS

Machine Learning

Regression, Classification, Clustering, LDA, PCA, Deep Neural Networks (DNN), Bayes Networks, SVMs, Decision Trees

Languages

Python, C++, Java, PHP, Android, Matlab, R

Frameworks

Machine Learning: Tensorflow, PyTorch, Scikit learn, Numpy, Pandas

Computer Vision: OpenCV, ROS

Cloud Services: AWS, Google Cloud, IBM Blockchain Platform, IBM Watson

Relevant Technologies

Hardware: Raspberry Pi, Arduino, DHT 22/11 Sensor, PIR Motion sensor.

EXPERIENCE

Data Scientist at Watopedia (DIFC, Dubai, U.A.E) April 2018 - Present

Develop a variety of software algorithms for the security sector. The result of the work showed an initial proof of concept system with real time performance on par with state-of-the art approaches when tested side by side on established computer vision datasets. Some of the most recent examples of the projects worked on are the following:

Facial Recognition with auto identity learn:

- Develop a robust face recognition pipeline for identity management.
- Automatically update database for learning new faces.
- Train and test a variety of different models for detecting and recognizing faces using SVMs, kNNs and CNNs
- Results:
 - Face detection AP @ 0.75: 70.
 - Face recognition accuracy: 90%.
 - Performance: 25 fps.

Autonomous Event Driven General Surveillance System:

- Automatic detection and real time notification of threats (suspicious behaviors and objects of interest)
- Detection of a variety of common objects such as people, cars and suitcases.
- Object segmentation by number of objects, color, location and time of detection.

- Track objects by detection using Kalman Filters and CNN Trackers

Weapons Detection System:

- Development of a data processing pipeline for data collection, cleaning and data augmentation.
- Build, train and tune machine learning models
- Tested different CNN architectures: SSD, Faster R-CNN, YOLOv3
- Results: mAP @.75: 60.

Vehicle and License Plate Recognition System:

- Development of a novel processing pipeline using selective search for robust license plate detection and recognition.
- Computer vision techniques used
 - Low level character segmentation: Edge Detectors, Blob Analysis, kNN
 - Character recognition: LSTM and DNN
- Results:
 - License plate detection AP @ 0.75: 71
 - License plate accuracy: 95%
 - Performance: 30 fps

Graduate Research & Teaching Assistant at York University (Toronto) 2013 – 2018

Graduate Research Assistant (May 2015 – August 2018):

- Worked on Computer Vision and Artificial Intelligence research at Tsotsos's Active and Attentive Vision Lab. Improvement of TarzaNN – a neural network simulator implemented in C++.
- Topics: Computer Vision, Convolutional Neural Networks, Computational Neuroscience

Teaching Assistant (January 2016 – April 2017):

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

- EECS 1570: *Introduction to Computing*
- EECS 3311: *Software Design*
- EECS 3101: *Programming Language Fundamentals*

Electrophysiology Lab (October 2013 – April 2014):

R. Lew's Electrophysiology Lab: Design and development of an electronic circuit for current-voltage measurements of *Neurospora crassa* hyphae.

Attention Learning Lab (April 2013 – August 2014):

T. Womelsdorf's Attention Learning Lab: Statistical EEG Data analysis of Macaque Monkeys for neural population decoding. Analyzed with Matlab's Statistics and Machine Learning Toolbox.

Software Developer Associate (November 2012 – April 2013):

Design and implement software interface and communication systems for York University's Rover Team using C++ and Python.

PUBLICATIONS

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.