

OMAR ABID

DATA SCIENTIST | Machine Learning | Computer Vision

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SUMMARY

A machine learning professional with four years combined academic industry experience with a special interest in computer vision. Seeking a full-time position as a Data Scientist or Machine Learning Engineer with a company that leverages artificial intelligence for their business solutions. Creative, action-oriented problem solver who thrives on coming up with innovative solutions to complex technical problems. Collaborative work ethic and dynamic presentation skills.

EDUCATION

Master of Science (MSc) in Computer Science 2018

York University, Toronto, ON, Canada

- Thesis topic on applying computer vision techniques using advances in computational neuroscience and artificial intelligence
- Cumulative GPA: A

Relevant Project: Designed and implemented a hand tracking and hand gesture classification system as an adjunct to a computer mouse:

- 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
- Real time gesture classification with a CNN allowing the user to interact with the computer

Relevant Courses: Data Mining, Advanced Topics in Computer Vision, Design and Analysis of Algorithms, Software Design, Data Structures

Honors Bachelor of Science (H.BSc) in Biophysics 2014

York University, Toronto, ON, Canada

Relevant Courses: Multivariate and vector calculus, linear algebra, experimental physics with data analysis, statistics, electronics

TECHNICAL SKILLS

Algorithms

Convolutional Neural Networks (CNNs), supervised and unsupervised classification, LDA, SVMs Adaptive Kalman Filter, Simultaneous Localization and Mapping (SLAM)

Programming Languages

Python, C/C++, Java, PHP, Android, MATLAB, R, JavaScript, Bash

Frameworks

Tensorflow, PyTorch, Scikit learn, NumPy, Pandas, OpenCV, ROS

Relevant Technologies

Raspberry Pi, Arduino, Android, Google Cloud and Azure

EXPERIENCE

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

Co-ordinated a team of developers for designing and programming a variety of software algorithms in the security sector with accuracy and performance metrics on par with state-of-the art systems. Assigned roles and participated in the implementation of the software and communicated current development progress with project manager. Some of the most recent examples of the projects worked on are the following:

Autonomous Event Driven General Surveillance System:

- Developed a general surveillance system for visual recognition of common objects allowing for the automatic detection and real time notification of threats (suspicious behaviors and objects of interest) in security critical environments
- Engineered additional algorithms for object tagging (by count, color, location or time) and tracking (using Kalman Filters and CNNs) allowing administrators to quickly search security relevant data

Facial Recognition System:

- Developed a robust face recognition pipeline allowing for real time identity management
- Engineered an algorithm to add new, previously unseen faces to the SQL database for seamlessly updating identities
- Trained and evaluated a variety of different models in Tensorflow for detecting and recognizing faces (e.g. SVMs, kNNs and CNNs) with metrics showing excellent performance on collected datasets
 - Face detection AP @ 0.75: 70.
 - Face recognition accuracy: 90%.
 - Performance: 25 fps.

Weapons Detection System:

- Developed a data processing pipeline (data collection, cleaning and augmentation) for rapidly training models leading to quick deployment for API usage by clients
- Programmed and tuned machine learning models in Keras using different base CNN architectures (e.g. SSD, Faster R-CNN, YOLOv3) which allowed us to choose and iteratively tune the best model leading to a robust and reliable system for weapon detection with the following metrics
 - mAP @.75: 60.
 - Performance: 100 fps

Vehicle and License Plate Recognition System:

- Development of a machine learning pipeline using open-source software for robust license plate detection, character segmentation and recognition using optical character recognition (OCR) allowing administrators to easily record statistics of vehicles in a controlled environment.
Preliminary benchmarks:
 - License plate detection AP @ 0.75: 71
 - License plate accuracy: 95%
 - Performance: 30 fps

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

Graduate Research Assistant (May 2015 – August 2018):

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

Teaching Assistant (January 2016 – April 2017):

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:

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

Electrophysiology Lab (October 2013 – April 2014):

Planned the design and developed an electronic for current-voltage measurements leading to a system which could reliably measure biological cells electrical potential for research purposes

Attention Learning Lab (April 2013 – August 2014):

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.

Software Developer Associate (November 2012 – April 2013):

Recommended and collaborated on the 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.