

# Tony Joseph

MSc. in Computer Science

Software Developer / Computer Vision / Machine Learning / Data Analyst



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## Objective

To secure a position as a machine learning/computer vision engineer, where I can apply my problem solving, computer programming, research and data analysis skills with a goal of further consolidating my professional background and learn new skills.

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## Qualification Summary

- 2+ years of proven experience in programming, with strong coding, analytical, and research skills
- Demonstrated ability and eagerness to learn and apply new techniques in a short period of time to develop a functioning system
- Excellent written and verbal communication skills
- Worked in diverse groups and proven to be a reliable and effective team player

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## Technical Skills

**Programming Languages:** Python (*Advanced*), C++ (*Intermediate*), C (*Intermediate*), Java (*Basic*),

**Front end development:** JavaScript (*Basic*), HTML5 (*Basic*), CSS3 (*Basic*)

**Web Frameworks:** jQuery (*Basic*), Bootstrap (*Basic*), webapp2 (*Basic*), jinja2 (*Basic*),

**Frameworks/Libraries:** Numpy (*Advanced*), Scipy (*Advanced*), Sklearn(*Advanced*), TensorFlow (*Advanced*), Pytorch (*Advanced*), Keras (*Advanced*), OpenCV (*Advanced*)

**Scientific Software :** MATLAB/Simulink (*Advanced*)

**Other:** Git/GitHub

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## Selected Projects

### Joint Spatial and Layer Attention

April 2019

- This work proposes an approach that learns to sequentially attend to different Convolutional Neural Network (CNN) layers (i.e., “what” feature abstraction to select) and different spatial locations within the selected feature map (i.e., “where”), to perform the task at hand.
- This approach was evaluated on two computer vision tasks: image based camera localization and indoor scene classification.
- Project link: <https://arxiv.org/abs/1901.05376>
- Technologies used: Deep Learning: **CNNs, RNNs (LSTMs)**  
Framework(s): **TensorFlow, Matplotlib, OpenCV**  
Programming Language(s): **Python**

### EdgeConnect: Generative Image Inpainting with Adversarial Edge Learning

January 2019

- This work proposes a two stage adversarial model EdgeConnect that comprises of an edge generator followed by an image completion network. The edge generator hallucinates edges of the missing region (both regular and irregular) of the image, and the image completion network fills in the missing regions using hallucinated edges as a priori.

- The model was trained on Places dataset (~9 million images) and showed state-of-the-art results compared to previous methods.
- Project link: <https://arxiv.org/abs/1901.00212>
- Technologies used: Deep Learning: **CNNs, GANs**  
Framework(s): **Pytorch, Matplotlib**  
Programming Language(s): **Python**

### Self-driving car projects

December 2017

- This work was done as a part of the Udacity self-driving car nanodegree program. This program teaches the skills and techniques used by self-driving teams at advanced technology companies.
- Few standout projects done are: Behavioral Cloning, Semantic Segmentation for Roads, Unscented Kalman-Filter, and Model Predictive Control (MPC).
- Project link: <https://github.com/tonyjo/CarND>
- Technologies used: Deep Learning: **CNNs**  
Framework(s): **TensorFlow, Numpy, Matplotlib, OpenCV**  
Programming Language(s): **Python, C++**

### Automated Attendance System

April 2016

- This system was designed to identify and record individuals that enter an environment. It also provides instant updates to the user.
- This was achieved by successfully integrating these technologies: RFID, Face Recognition and Android based mobile device, coupled with a friendly User-Interface.
- My duties for this project included: Implement face recognition system, user-interface design, user profile management, and overall integration of all three systems.
- Technologies used: **MATLAB**

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## Work Experience

### University of Ontario Institute of Technology - Research Associate

June 2019-Present

- Working on sequential prediction using spatial attention for both localization and prediction.
- Technologies used: Framework(s): **TensorFlow, Scipy, OpenCV**  
Programming Language(s): **Python**

### Echaperone-SPXTRM Health - Applied Computer Vision Intern

July 2017-November 2017

- Helped collect data for testing vision algorithms in real-world long-term care scenario.
- Worked on vision algorithms such as person detection, face-detection, face recognition, etc.
- Provided advice on hiring and vision technology related matters.
- Technologies used: Framework(s): **TensorFlow, Matplotlib, OpenCV**  
Programming Language(s): **Python, C++**

### University of Ontario Institute of Technology - Teaching Assistant

September 2016-Present

- Assisting professors with lessons and evaluated assignments, tests. Held office hours to ensure students understood course concepts.
- Taught with the following courses: Introduction to Programming Using Python, Data Structures, Introduction to Computer Vision, and Programming Workshop-2 using C++.

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## Education

**Udacity** - *Self-Driving Car Nanodegree*

December 2017

**University of Ontario Institute of Technology** - *Computer Science, M.Sc.*

June 2019

**University of Ontario Institute of Technology** - *Electrical Engineering, B.Eng.*

May 2016

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