

# Shihan Ai

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## EDUCATION

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### University of Toronto

**Sept 2012 – June 2017**

Honours Bachelor of Science with Distinction, Computer Science, Specialization in Artificial Intelligence

Major GPA: 3.58/4.00 (CGPA: 3.40/4.00)

## TECHNICAL SKILLS

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**Computer Vision & Machine Learning:** Python, C++, MATLAB, NumPy, OpenCV, TensorFlow

**Web Development:** HTML, CSS, JavaScript, NodeJS, React, SQL, MongoDB

## PROFESSIONAL EXPERIENCE

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### IBM, Software Engineer Intern

**May 2015 – Aug 2016**

- Designed the backend of a central analytics platform for IBM dashDB using NodeJS and IBM DB2
- Created infographics using D3.js with live data from dashDB and provided managers with real-time analytics
- Analyzed the collected data and identified the pain points that customers had with IBM dashDB
- Developed a tweet scheduler with NodeJS and DB2 to automate the promotion of IBM DB2 on Twitter
- Automated the collection of video analytics from YouTube using Python and generated infographics using D3.js to capture the effectiveness of IBM DB2 promotional videos on YouTube

### University of Toronto, Research Assistant

**May 2014 – Aug 2014**

- Developed a script with Python and NLTK that can attach semantic meaning to unstructured web data
- Built a Twitter bot with Python that can respond to movie related tweets with showtimes and recommendations
- Performed lexical analysis on tweets to understand the structure of natural language on social media

## PROJECTS

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### Photo Enhancer

**July 2017 - Present**

- Created a command line tool in C++ and OpenCV that can add various visual effects to digital photos
- Tested various smoothing functions and evaluated their effectiveness in achieving a photogenic blurring effect
- Implemented color mapping effects to user marked objects in an image by utilizing foreground extraction techniques and by processing the RGB image in the HSV color space
- Currently creating an iOS mobile application using Swift that employs optimized foreground extraction techniques to enhance high resolution photos taken by the cameras on modern day mobile phones

### Optimized Interactive Foreground Extraction

**June 2017 – July 2017**

- Engineered an algorithm using Python, NumPy, and OpenCV that can classify pixels in an image as either the foreground or the background of the image
- Independently researched and implemented methods to decrease processing time when processing HD photos
- Performed benchmark tests against traditional foreground extraction methods such as GrabCut and improved the processing time of 12-Megapixel (3024 x 4032) images from an average of 74 seconds to 3.6 seconds

### Exemplar-Based Image Inpainting

**May 2017 – June 2017**

- Independently researched and implemented an algorithm in Python, NumPy, and OpenCV that can crop out user defined areas in an image and replace the cropped-out areas with visually plausible textures
- Analyzed and identified the optimal hyper parameters to produce results with little or no optical artifacts
- Identified and applied the algorithm to real world applications such as acne removal in digital photos

### Seam Carving

**Nov 2016 – Dec 2016**

- Utilized dynamic programming and Python to efficiently perform content-aware image resizing on an image by removing seams comprised of the least significant pixels
- Performed tests to measure the effectiveness of various definitions of pixel significance and concluded that using the image gradient produced the best results

