

# XIAOYU LIU

Phone: 778-683-0720

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Linkedin: <https://ca.linkedin.com/in/liu-xiaoyu-25b90096>

## TECHNICAL SKILLS

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- **Languages:** Python, C/C++, Matlab, HTML, VHDL
- **Operating System:** Windows, Linux CentOS, Linux Ubuntu
- **Tools:** Caffe, PyTorch, Vim

## WORK EXPERIENCE

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### Computer Vision Research Intern

Jan 2017 to Present

Sengled Technologies of Canada Ltd.  
Downtown Vancouver, BC, CA

- Bidirectional customer flow counting based on real-time surveillance video with Caffe and Python
- Crowd density map estimation and demographic analysis with PyTorch and Python

### Research Assistant

Sept 2015 to Jan 2017

The Vision and Media Lab, *Simon Fraser University*, Burnaby, BC, Canada

**Project:** Maximum-Margin Clustering based on Deep Learning

- Stretched deep learning framework into unsupervised learning, applied deep networks on clustering.
- Made use of pre-trained deep network, mainly AlexNet, in Convolutional Architecture for Fast Feature Embedding(Caffe) written in C++ to extract high-level semantic features of images and fine tune networks further.
- Embed different layers written in Python, C++ and modified the source scripts of Caffe framework to realize combination of feature extraction and clustering algorithm

### Reviewer

Jan 2016

IEEE Winter Conference on Applications of Computer Vision 2016  
Lake Placid, NY, USA

- Provided the overall rating of papers and detailed comments to help program chair make the final decision.

### Teaching Assistant

Sept 2015 to Dec 2015

Intelligent Systems  
*Simon Fraser University*

- Conducted student consultations, graded homework and examinations.

## PROJECT EXPERIENCE

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### Facial Key Point Detection Using Convolutional Neural Network

Nov 2015 to Dec 2015

Machine Learning, *Simon Fraser University*

- In a team of three to propose a regression model based upon convolutional neural network (CNN) to localize facial key points using Lasagne library with Python and Theano
- Implemented a considerably shallower convolutional neural network of only three convolutional layers to predict 15 key points simultaneously with relatively high accuracy(ranked 33 then) on Kaggle dataset
- Combined a multi-face detector with our facial key point detection model to realize real-time facial key point detection

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## Missing Words Prediction

Nov 2015 to Dec 2015

Introduction to Data Mining, *Simon Fraser University*

- Independently predicted the top 5 missing words for each article provided by instructor, making use of collaborations of authors of provided articles, and words existing in each article.
- Transformed the matrix containing unique words in each essay into a sparse matrix and implemented different algorithms using Matlab to select 5 words with highest probability for each essay.
- Made use of algorithms including K-Nearest Neighbors, Words frequency, Clustered words frequency and Bagging tree with linear SVM to obtain the probabilities.

## Smart Gadget and Technologies for Personal Safety

Oct 2014 to Jun 2015

Innovation and Design Course

*University of Science & Technology of China* – Hefei, Anhui, China

- Acted as a group leader of four to design a wearable bracelet for protecting women's safety by reminding potential danger around with low safety score
- Engaged in designing and implementing of an Android APP using JAVA and the design of corresponding bracelet

## Image-based Research about Facial Score Calculation and Prediction

Mar 2015 to Jun 2015

*University of Science & Technology of China* – Hefei, Anhui, China

- Independently implemented four different algorithms written in C++ to calculate facial scores based on a sparse matrix containing results of comparisons of face pairs
- Applied Convolutional Neural Network(CNN) implemented by Matlab and Local Binary Patterns(LBP) to predict facial scores

## VOLUNTEER

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- IEEE Conference on Computer Vision and Pattern Recognition Area Chair Workshop Feb 2016  
– AC meeting general help

## EDUCATION

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**Master of Science** in Computing Science

Sept 2015 to Present

*Simon Fraser University*, Burnaby, BC, Canada

- Specialization: Machine Learning & Computer Vision

**Bachelor of Engineering**

Sept 2011 to Jun 2015

*University of Science & Technology of China* – Hefei, Anhui, China

- Specialization: Automation