

Jimmy Shen

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Summary

Experienced and Enthusiastic Software Engineer. Creative, and hands-on machine/deep learning researcher/engineer. 1) Designed a real-time 3D object detection system and the system is used to support real-time indoor robotic (Fetch) navigation. 2) Developed a 2D video understanding system for Google and the system is used for Youtube video analysis. 3) Design a novel Graph Neural Network architecture that achieves a new state of the art for link prediction. 4) Advanced data visualization skills. 5) Familiar with the deep learning frameworks (Tensorflow, Pytorch, and DGL). 6) Top 1.7% Leetcode coder (global rank 1,774 out of 104,355 based on the Leetcode contest as of June 2020). 7) Strong collaboration and communication skills.

Technical Skills

Python(> 60 K loc), C++(> 10 K loc), R, Tensorflow, Pytorch, DGL, AWS, Machine Learning, Deep Learning, Data Visualization, Algorithms, Multi-Threads, Linux/Unix, Git.

Education

The Graduate Center, City University of New York

New York, USA

PH.D., COMPUTER SCIENCE, GPA: 3.64/4.00

08/2014 – 8/2020 (expected)

Beijing Technology & Business University

Beijing China

BACHELOR OF ENGINEERING, INFORMATION ENGINEERING

09/2003 – 07/2007

Work Experience

Google

Pittsburgh, PA

SOFTWARE ENGINEER INTERNSHIP

05/2018 – 08/2018

- **Predicted critical events based on a large video dataset by using 3D CNN and Bidirectional LSTM.**
- Parallely train networks under google's cloud computing system to search the best model and algorithm.
- Parallely pre-processed more than 80M frames high-resolution videos by using google's distributed system.
- Visualized video prediction results to demonstrate the performance of the system
- Key skills used: Python, C++, Multi-Threads, Deep learning, TensorFlow, Distributed Computing, Model searching, Data Visualization.

Philips North American Research

Cambridge, MA

DEEP LEARNING & SOFTWARE ENGINEER INTERNSHIP

05/2017 – 08/2017

- **Using deep convolutional neural network to analyze intersection videos.**
- Interesting objects are tracked based on 2D object detection/semantic segmentation results. Behaviors of those objects are further analyzed to predict critical events.
- The model is trained based on the AWS EC2 P2 GPU instance.
- Key skills used: Python, Machine Learning, Deep learning, MXNet, Data Visualization.

The City University of New York

New York, USA

ADJUNCT FACULTY

08/2015 – now

- I have been teaching CSci 127 Introduction to Computer Science, CSci 132 Practical UNIX and Programming, CSci 340 Operating Systems for Hunter College (CUNY). I had taught CSC 446 Computer Architecture, CSC 475 Image Processing in Computer Science for the College of Staten Island (CUNY).

Huawei Technologies

Shanghai, China

ALGORITHM ENGINEER

07/2007 – 06/2011

- **Designed three algorithms for Huawei's commercial wireless LTE system:** One was used to reduce the system power consumption, one was used to maintain the connection between network and smartphones and the last one was used to predict system failures and fix failures once detected.
- Simulated and analyzed performances of designed algorithms under different application scenarios.
- Key skills used: Algorithm design, Simulation, C++.

Academic Experience

The Graduate Center, CUNY

New York, NY

MACHINE/DEEP LEARNING RESEARCHER

03/2020 - now

- **Developing new drugs for COVID-19 by using semi-supervised machine learning and Graph Neural Network (GNN):** I have participated in Professor Lei Xie's Computational Biology Lab to work on an urgent project which is using the GNN to help discover new drugs for COVID-19
- Key skills used: Graph Neural Network, Python, PyTorch, Deep Graph Library, Semi-supervised learning.

The Graduate Center, CUNY

New York, NY

DATA VISUALIZATION RESEARCHER

03/2020 - now

- **Social media data Visualization and Analysis:** Work with Dr. Lev Manovich in his Cultural Analytics Lab of Graduate Center of CUNY to analyze the social media data by using machine learning and graph neural networks.
- Key skills used: Python, Data Visualization.

The Graduate Center, CUNY

New York, NY

MACHINE/DEEP LEARNING RESEARCHER

08/2019 - now

- Have developed a **3D object segmentation system** based on 3D voxelized images generated from SUN RGBD dataset. The segmentation results are further fed to a 3D detection framework to finalize 3D object detection.
- Key skills used: Python, C++, Instance Segmentation, Tensorflow, Deep Learning.

The Graduate Center, CUNY

New York, NY

MACHINE/DEEP LEARNING RESEARCHER

08/2017 - 08/2019

- Have developed an end-to-end **2D/3D object detection system** based on a novel deep learning framework. The system is designed to process both the outdoor KITTI dataset and the indoor SUNRGBD dataset. The system processes 20 frames per second 3D object detection with comparable detection results to the state-of-the-art, achieving a 2x+ speedup.
- Using both GPU machine instance from Google Cloud and local Nvidia V100/TITAN GPUs to train the network.
- Key skills used: Python, C++, Deep Learning, Tensorflow, Algorithm Design, Data Visualization.

The Graduate Center, CUNY

New York, NY

RESEARCH ASSISTANT

08/2014 - 08/2017

- **Classify 3D objects** by using NN, SVM and low-rank approximation algorithm based on 3D cloud point images.
- Key skills used: Python, Machine Learning.

Publications and Patents

Variational Graph Isomorphism Auto-Encoders, **Xiaoke Shen**, Lei Xie, in preparation.

Frustum VoxNet ++: 3D object segmentation/detection from RGB-D or Depth images, **Xiaoke Shen**, Ioannis Stamos, in preparation

Frustum VoxNet for 3D object detection from RGB-D or Depth images, **Xiaoke Shen**, Ioannis Stamos, WACV 2020.

A Survey of Object Classification and Detection based on 2D/3D Images, **Xiaoke Shen**, arXiv 2019.

Method and device for reducing handover signaling, Jihai Han, **Xiaoke Shen**, 2016.

Adaptive particle filtering in data assimilation of wildfire spread simulation, Gu, F., Butt, M., Ai, C., **Shen, X.**, and Xiao, J., 2015 Summer Simulation Multi-Conference, 159-168, 2015

Selected School Projects

SENTIMENT ANALYSIS OF FINANCIAL ARTICLES

- Annotated financial articles downloaded from Seeking Alpha.
- Used Naive Bayes and SVM to train and predict the sentiment of financial articles.

TWITTER POSTING VISUALIZATION

- Visualized and analyzed the Twitter posting from 8 cities by using Python and R.

CURSE OF DIMENSIONALITY

- Simulated the performance of distance-based machine learning algorithms' performance when increasing the data dimension.
- Have a deep understanding of *Curse of Dimensionality* in machine learning.