Xiwen Li

GitHub: https://github.com/lix4
Personal Website: https://lix4.github.io
Email: xiwenli@wustl.edu
Tel: (812)-239-7098

RESEARCH INTERESTS

Computer Vision, Machine Learning, Geometric Computing, Optimization

EDUCATION

Washington University in St. Louis (WUSTL)   **St. Louis, MO**

M.S. in Computer Science   August 2018 – Present

GPA: 3.94/4.0

Rose-Hulman Institute of Technology (RHIT)   **Terre Haute, IN**

B.S. in Computer Science   August 2014 – May 2018

Minor: Mathematics and Japanese

PUBLICATION

Zhenhua Chen, **Xiwen Li**, Chuhua Wang, David Crandall, *P-CapsNets: A General Form of Convolutional Neural Networks,* under review of CVPR 2020

RESEARCH EXPERIENCE

Research Internship, Indiana University computer vision lab   Bloomington, IN

Advisor: Dr. David Crandall   May 2019 – Present

Project: Pure Capsule Network

- ❖ Prototyped high-rank tensor convolution/deconvolutional layers with accelerated computation using CUDA kernel and CAFFE.
- ❖ Designed a pure convolutional capsule network imitating FCN for classification and semantic segmentation and tested them on Cifar100, ImageNet and PASCAL VOC.
- ❖ Performed experiments on proposed models with different hyper-parameters and structures.
- ❖ Studied generalization ability and correlation between weights of proposed model by visualizing loss and trained weight filters.
- ❖ Developed the skill to report progress in weekly group meetings and to ask for help.
- ❖ Paper currently under review of CVPR 2020.

Project: 3D Reconstruction

- ❖ Investigated five satellite image datasets and summarized information on them.
- ❖ Annotated ground truth data of DFC 2019.
- ❖ Summarized paper FrameNet and RoomNet as parts of a survey paper.

Independent Study, Washington University in St. Louis   St. Louis, MO

Advisor: Dr. Ayan Chakrabarti   January 2019 – May 2019

Independent Study: Implementation practice of deep learning models for image restoration problems including denoising and super-resolution.

- ❖ Analyzed papers of IRCNN and SRCNN.
- ❖ Built IRCNN and SRCNN using TensorFlow.

- ❖ Verified the performance of IRCNN by getting similar PSNR as the original paper with variation within $\pm$1dB.

Class Project, Rose-Hulman Institute of Technology   Terre Haute, IN
Project: Tracking Block Movement with Respect to Camera   October 2017 – November 2017
- ❖ Pre-processed the input pixel data based on videos obtained from earlier experiments to make sure that information perfectly aligned with sensor data in the output CSV file in order to build precise mapping between input video and output sensor data for training.
- ❖ Trained a convolutional neural network to develop regression model to predict the moving process of the blocks without sensors using Keras.
- ❖ Established different hyper-parameters to run 20 trials of convolutional neural network and compared different training errors and identified the optimal convolutional neural network.
- ❖ Applied remote high-performance computer to run these 20 trials and wrote these research findings in log file for future analysis.

PROFESSEIONAL EXPERIENCE

Rose-Hulman Institute of Technology   Terre Haute, IN
Rosebotics AI Challenge Team
Enemy Tracking System Developer   January 2018 – May 2018
- ❖ Worked in an interdisciplinary engineering team to compete in ICRA 2018 DJI RoboMaster AI Challenge and won technical proposals assessment.
- ❖ Developed a threshold based red light tracking algorithm using Python OpenCV for robot to track enemies at real-time during the competition and tested with different parameter values to achieve optimal performance in indoor light condition.
- ❖ Deployed the tracking script on Raspberry Pi and integrated with robot turret designed by mechanical engineering students to form an integral attacking system.

Rose-Hulman Institute of Technology   Terre Haute, IN
Department of Computer Science and Software Engineering
Teaching Assistant of Introduction to Web Programming   August 2017 – November 2017
- ❖ Supported peer students with learning difficulties and designed tailor-made teaching activities to help students improve programming skills.
- ❖ Served as a TA to respond to students' questions regarding course content on Piazza.com.
- ❖ Used Bash script to collect, manage and grade students' assignments through Git.
- ❖ Developed social networking and improved interpersonal skills.

Trend Micro   Nanjing, China
Summer Intern, Quality Assurance Team   June 2015 – July 2015
- ❖ Collaborated with other co-workers to translate an English-language textbook regarding total quality management to Chinese version.
- ❖ Learned how to adjust the format of text in different software packages so that make sure the translated version in compliance with the original one.

LANGUAGES AND TECHNOLOGIES

Programming Languages: Python, C++, MATLAB, Java, C, Scheme, JavaScript
Professional skills: TensorFlow, CAFFE, NumPy