BINGZHAO SHAN

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SUMMARY OF TECHNICAL SKILLS

Proficient Languages: Python, Java, C, C++, Linux Shell, HTML, MATLAB, SQL, JavaScript, Shell
Tools and Packages: AWS, Jinja, Flask, AngularJS, MySQL, PostgreSQL, PyTorch, OpenCV, TensorFlow
Proficient Concepts: Object-oriented design, data structures, Agile environment, complexity analysis, machine learning
Interest: Computer Vision, Few-shot Learning, 3D Understanding

EDUCATION

University of Michigan, *Ann Arbor, MI* 09/2020-Present
- Master of Science (MS) in Computer Science and Engineering

University of Toronto, *Toronto, ON* 09/2015-06/2020
- Bachelor of Science (BSc), Computer Science Specialist, Mathematics Minor
- Dean's Honor List 2017 Winter, 2017 Summer, 2018 Winter
- Graduated with high distinction

WORK EXPERIENCE

Epson Canada (PEY), *Markham, ON* 08/2018-08/2019
Software Developer, Computer Vision (Algorithm Research/ Evaluation)
- Advisor: **Dr. Jie Wang**
- Topic: Human-fingertip segmentation and research analysis
- Epson Spotlight Award
- Presented to 50+ colleagues on Epson Monthly Meeting
- Responsibility: Other than fingertip segmentation, I also worked on several parts of the project including calibration, research analysis, tool development, and evaluation.

Aggregate Intellect, *Toronto, ON*
Engineer Associate 05/2019-12/2019
Research Associate 01/2020-06/2020
- Explored approaches based on SIFT, SURF, and ORB
- Developed a video annotation tool and the pipeline evaluation tool
- Achieved 95% detection accuracy on our test dataset
- Published a paper as the first author on ICISDM.

TEACHING&GRADING

University of Michigan

EECS492: Intro to Artificial Intelligence (2020 Fall, Grader)

University of Toronto

I was/am/will be a Teaching Assistant for:

CSC148H1: Introduction to Computer Science (2020 Winter, Teaching Assistant)
CSC321H5: Introduction to Neural Networks and Machine Learning (2020 Winter, Teaching Assistant)

PUBLICATIONS & PREPRINTS

- **Bingzhao Shan**, Muhammad Rizwan Abid, Ehsan Amjadian, "Hybrid Unsupervised Scale-invariant Slide Detection (HUSSD) for Video Presentation", *International Conference on Information System and Data Mining* (**ICISDM**), Hawaii, United States, 2020. (**Oral**)

PROJECT & PROGRAMS

An Instagram clone implemented with server-side dynamic pages September 2020

- Used Jinja2 to generate and render front-end HTML/CSS templates.
- Designed database using SQLite.
- Implemented the web framework using Flask.
- Deployed the web on AWS.

Finger/Hand/Background Segmentation (Epson) March 2019

- Developed, trained, and evaluated Deep Neural Networks based on FCN for finger segmentation, using Keras and TensorFlow.
- Implemented several loss functions, including dice loss, weighted cross-entropy loss, and focal loss.
- Programmed data augmentation functions, including rotation, intensity change, and blur.

Fingertip Detection Network and Touch/Hover classification Network (Epson) December 2018

- Optimized the detection network based on YOLO architecture with senior machine learning researchers.
- Implemented random distortion function for data augmentation.
- Designed and implemented the annotation tool and the evaluation tool.

Conditional Specific Analysis System (Epson) November 2018

- Led the design and implementation of the conditional specific analysis system based on OpenCV.
- Provided 100% research analysis data for the team.
- Won Epson Spot Light Award (as the only intern).
- Presented the project to 50 employees in Epson's monthly meeting.

Interactive Gomoku-GameSearchTree, Python August 2017

- Coded Heuristic function and Greedy Algorithm
- Implemented Min-Max-Cut Algorithm
- Demo: https://github.com/zuoyigehaobing/Gomoku-GameTreeSearch

Shot Detection/ Face Detection/ Gender Classification, MATLAB November 2017

- Implemented Video Shot Detection using **SAD** and **HD** Methods.
- Implemented Face Detection Algorithm using **HOG detector, Sliding Window Algorithm, and SVM.**
- Implemented the Gender Classification Algorithm using SVM.
- Demo: https://github.com/zuoyigehaobing/Face_Detection

VOLUNTEER EXPERIENCE AND OTHER ACTIVITIES

Educational Aid in Depressed Area	Biology Teacher	2012
Marching Band	Saxophone Player	2014
Freshman Orientation	Math Tutor	2017