

# XIJIE HUANG

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## EDUCATION

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### Hong Kong University of Science and Technology

Ph.D. in Computer Science Engineering, [HKUST Vision and System Design Lab](#)

Hong Kong SAR  
*Sept 2020 - Present*

- Advisor: [Prof. Tim Kwang-Ting CHENG](#) and [Prof. Zhiqiang SHEN](#),
- HKUST Postgraduate Studentship and RedBird Scholarship

### Shanghai Jiao Tong University

B.E. in Measurement, Control Technology, and Instrumentation  
School of Electronics Information and Electrical Engineering

Shanghai, China  
*Sept 2016 - June 2020*

- Overall GPA: 89.4/100 (91.3/100 for junior year) [Ranking:2/55](#)
- Advisor: [Prof. Cewu Lu](#), Machine Vision and Intelligence Group, SJTU

### University of California, Los Angeles

Visiting Research Student

Los Angeles, USA  
*June 2019 - Sept 2019*

- Research intern to UCLA ECE department (Cross-disciplinary Scholars in Science & Technology Program)
- Overall GPA: 4.0/4.0
- Best Presentation Award (Among 90 students in CSST Program)
- Advisors: [Prof. Mani B. Srivastava](#), Department of Electrical Computer Engineering, UCLA

## RESEARCH INTERESTS

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My research interests lie in the general area of artificial intelligence, particularly in deep learning and its applications in computer vision and model compression. More concretely, My research interests focus on mixed-precision quantization, co-design of model compression, human-object interaction (HOI) recognition, and scene understanding.

## RESEARCH/PROJECT EXPERIENCE

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### Automated Vision-Based Wellness Analysis for Elderly Care Centers, HKUST

- Researching in building vision-based elderly care system that can provide immediate assistance and useful insights for care-takers. Collaborating with the heaven of hope care center and has built a healthcare dataset based on video recording.
- Designing human-centered scene understanding model, achieving state-of-the-art accuracy on scene graph generation (SSG) task and human-object interaction (HOI) recognition task.

### Hardware-Software Co-design of Model Compression, HKUST

- Proposed Stochastic Differentiable Quantization (SDQ), which is an efficient and effective mixed-precision quantization techniques outperforming full-precision ResNet and MobileNet on ImageNet with average bitwidth lower than 4.
- As a member of [AI Chip Center for Emerging Smart Systems \(ACCESS\)](#), building and evaluating hardware-friendly model compression techniques on AI chips.

### Engagement Analysis for Virtual training, HKUST

- Collaborated with [Own The Room](#), build vision-based facial and gesture analysis system to automatically predict the engagement of users in virtual training.

### SSC project to monitor and reduce food waste at on-campus canteens, HKUST

- Built and fine-tune the food classification and food waste prediction models. Successfully finished the pilot run at campus (LG1/LG7) to raise the awareness of students on foodwaste.

### Machine Vision and Intelligence Group, Department of Computer Science, SJTU

- Proposed [Transferable Interactiveness Network](#) to tackle the imbalanced distribution in human action recognition problems, especially human-object interaction detection problems

- Built the state-of-the-art knowledge base and engine of human activity understanding **HAKE**. HAKE provides elaborate and abundant with 7 M+ fine-grained part level annotations in a large scale of images and videos. In supervised, few-shot and transfer learning, our approach achieves significant improvements on large-scale activity benchmarks

#### **Networked Embedded Systems Laboratory, Department of Electrical Computer Engineering, UCLA**

- Designed an algorithm to detect Trojan backdoor in deep neural networks (i.e., whether a neural network has been compromised by malware that causes the model to produce incorrect results when the input includes special triggers.)
- Proposed a detection framework called **NeuronInspect**, using visual interpretability technique to effectively detect Trojan backdoors in deep neural networks without restoring the trigger and any backdoor samples
- Evaluate **NeuronInspect** on different attack scenarios and prove better robustness and effectiveness over previous state-of-the-art trojan backdoor detection techniques by a great margin

## **PUBLICATIONS & PRE-PRINT**

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### **SDQ: Stochastic Differentiable Quantization with Mixed Precision**

**Xijie Huang**, Zhiqiang Shen, Shichao Li, Zechun Liu, Xianghong Hu, Jeffry Wicaksana, Eric Xing, Kwang-Ting Cheng  
International Conference on Machine Learning (ICML) 2022 (Acceptance Rate: 21.9%)

### **Automated Vision-Based Wellness Analysis for Elderly Care Centers**

**Xijie Huang**, Jeffry Wicaksana, Shichao Li, Kwang-Ting Cheng  
AAAI Conference on Artificial Intelligence (AAAI) W3PHIAI 2022

### **Transferable Interactiveness Knowledge for Human-Object Interaction Detection**

Yong-Lu Li, Xinpeng Liu, Xiaoqian Wu, **Xijie Huang**, Liang Xu, Cewu Lu  
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2021

### **Latent Fingerprint Image Enhancement based on progressive generative adversarial network**

**Xijie Huang**, Peng Qian, Manhua Liu  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020 Biometric Workshop

### **PaStaNet: Toward Human Activity Knowledge Engine**

Yong-Lu Li, Liang Xu, Xinpeng Liu, **Xijie Huang**, Shiyi Wang, Hao-Shu Fang, Cewu Lu  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020 (Acceptance Rate: 22.09%)

### **Transferable Interactiveness Knowledge for Human-Object Interaction Detection**

Yong-Lu Li, Siyuan Zhou, **Xijie Huang**, Liang Xu, Ze Ma, Hao-shu Fang, Yanfeng Wang, Cewu Lu  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019 (Acceptance Rate: 25.15%)

### **FedMix: Mixed Supervised Federated Learning for Medical Image Segmentation**

Jeffry Wicaksana, Zengqiang Yan, Dong Zhang, **Xijie Huang**, Huimin Wu, Xing Yang, Kwang-Ting Cheng  
Preprint

### **Handling Underrepresented Classes for Voxel-based Stereo 3D Object Detection**

Shichao Li, **Xijie Huang**, Zhiqiang Shen, Kwang-Ting Cheng  
Preprint

### **NeuronInspect: Detecting Backdoors in Neural Networks via Output Explanations**

**Xijie Huang**, Moustafa Alzantot, Mani.B.Srivastava  
Preprint

### **HAKE: Human Activity Knowledge Engine**

Yong-Lu Li, Liang Xu, Xinpeng Liu, **Xijie Huang**, Ze Ma, Hao-Shu Fang, Cewu Lu  
Preprint

## **SELECTED ACADEMIC ACHIEVEMENTS**

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National Scholarship (Top 2% students in Shanghai Jiao Tong University)	2017
A Class Scholarship (Top 2% students in Shanghai Jiao Tong University)	2017
Second Prize in China Undergraduate Mathematical Contest in Modeling, Shanghai Division.	2017
Endress+Hauser Scholarship, Endress+Hauser Inc.	2018
Meritorious Winner in MCM & ICM, Comap.	2018

CSST Scholarship (USD \$5,343) University of California, Los Angeles	2019
Best Presentation Award (Among 90 research interns at UCLA)	2019
RongChang Academic Scholarship (Highest honor in Shanghai Jiao Tong University, <b>Top 20</b> of 16000 students)	2019
A Class Oversea Research Fellowship	2019
8th place in ICCV 2019 Person In Context Human-Object Interaction Challenge	2019
RedBird Scholarship (HKD \$40000) Hong Kong University of Science and Technology	2020
Postgraduate Studentship, Hong Kong University of Science and Technology	2020-2022
AAAI-22 Student Scholarship	2022

## SERVICES AND EXPERIENCES

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### Reviewer

- Conference: WACV2021, ICML 2022, ECCV 2022

### Teaching Assistant

- COMP 5421 (Computer Vision), Spring 2021, Lecture: Professor Dan Xu
- COMP 1021 (Introduction to Computer Science), Fall 2021, Lecturer: Professor David Rossitor

### Volunteer

- Shanghai International Marathon (2016)
- China-Korea Symposium on Artificial Intelligence and Brain Science (2019)

## COMPUTER AND LANGUAGE SKILLS

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<b>Natural Languages</b>	Chinese (native), English (fluent), Japanese(fluent)
<b>Programming Languages</b>	Python, MATLAB, C, C++
<b>Deep Learning Framework</b>	PyTorch, TensorFlow, Keras
<b>Miscellaneous Skills</b>	LaTeX, Altium Designer, Proteus, LabVIEW

## STANDARD TEST

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<b>TOEFL</b>	105 (Reading:28 Listening:30 Speaking:24 Writing:23)
<b>GRE</b>	322 (Q170+V152) + 3.5(AW)