YUANJUN CHAI
The University of Hong Kong
yuanjunchai89@gmail.com
+86 15029679576
Professorial block
Pok Fu Lam, Hong Kong

Personal Website: http://yuanjunchai.github.io
Lab Website: http://xpixel.group/

PROFESSIONAL APPOINTMENTS

2021-present **Research Assistant, The University of Hong Kong**
Advisor: Dr. Jason Pui Yin Cheung

2020-2021 **Research Assistant, Tsinghua University**
Intelligent Media and Cognition Laboratory, School of Software
Advisor: Dr. Yue Gao

2019-2020 **Research Assistant, Shenzhen Institute of Advanced Technology, Chinese Academy of Science**
Multimedia Laboratory at SIAT-CAS & CUHK, Institute of Advanced Computing and Digital Engineering
Advisor: Dr. Chao Dong, Dr. Yu Qiao

2019-2020 **Teaching Assistant, Shenzhen Institute of Advanced Technology, Chinese Academy of Science**
Institute of Advanced Computing and Digital Engineering

2015-2019 **Research Assistant, Xidian University, China**
Key Laboratory of Intelligent Perception and Image Understanding, Ministry of Education, China
Advisor: Dr. Fei Qi
Bioinformatics Lab, Advisor: Dr. Xiaoke Ma

2019 **Founder and Maintainer, Lab Group Website** (http://xpixel.group/)

EDUCATION

2021-present **Mphil,** Li Ka Shing Faculty of Medicine, The University of Hong Kong

2020-2021 **Visiting Scholar**, School of Software, Tsinghua University

2019-2020 **Visiting Scholar**, Shenzhen Institute of Advanced Technology, Chinese Academy of Science

2019 **B.E.** Xidian University, China
Major in Electronic and Information Engineering (Photoelectric Imaging)

2018 **Cambridge Summer Academic Programme**, Catharine's College, University of Cambridge, UK
Artificial Intelligence – Advisor: Dr. Pietro Lio'

SKILLS & LANGUAGE PROFICIENCY

Coding: Python, C/C++, Java, MATLAB
Deep Learning Frameworks: PyTorch, TensorFlow
Web Development: HTML, CSS, JavaScript, Bootstrap, Flask, Jekyll
Other Skills: OmniGraffle, Visio, Latex, QUARTUS, VHDL, Multisim
Language Proficiency: Chinese (*Native*), English (*Fluent, TOEFL 107, L25, R30, S25, R27*)

HONORS & AWARDS

2019 **Undergraduate Evaluation**
Outstanding Undergraduate Student Award

2019 **Undergraduate Dissertation**
Outstanding Undergraduate Thesis Award (13/5000)

Topic: Image Inpainting Based on Deep Learning

2018 **National University Computer Design Contest**

Second Prize - Artificial Intelligence

2017 **National Student Innovation Training Program**

Outstanding Award - Placed 5th/100

2017 **Mathematical Contest in Modeling (MCM) & Interdisciplinary Contest in Modeling (ICM)**

Merit

2016 **National Mathematical Contest in Modeling**

First Prize

2016 **Academic & Technology Contest: XingHuo Cup**

Second Prize

2016 **Speech Contest: Xidian University**

Second Prize

2016 **Silk Road Cloud Classroom Analog Electronic Technology Circuit**

Comprehensive Design Special Award

PUBLICATIONS

Yuanjun Chai. Yushen Zuo. &Zixiang Zhao. "Continuous Interventions Estimation via Attention Generative Adversarial Networks." NIPS (The Conference on Neural Information Processing Systems). 2021. (pending).

Yuanjun Chai. Siqi Li. & Yue Gao. "Spiking Neural Network Based Super-Resolution for Event-Stream Vision." ICCV (IEEE Conference on International Conference on Computer Vision). 2021. (pending).

Yuanjun Chai. Chao Dong. & Yu Qiao. "Blind Video Super Resolution with Iterative Correction." TIP (IEEE Transactions on Image Processing). 2021. (pending).

Shengli Zhang. Huayi Wang. **Yuanjun Chai** & Jiangcheng Ge. "Genotypic Difference Analysis in SNP Genome-wide Gene Interactions." *Advanced Mathematics Research*. ISSN1008-1399. 2018.

RESEARCH PROJECTS

2020-2021 **Continuous Interventions Estimation via Attention Generative Adversarial Networks**

- Estimation of the intervention treatment is a challenging task since the demand of learning individual's potential outcomes from limited data. However, we do not have access to the counterfactuals, which leaves us a research gap to fill in. Although some works are about discrete interventions, fewer works are discussed with continuous-valued interventions.
- In this work, we propose the channel attention generative adversarial networks (CAGAN) framework. Specifically, we propose a pool of counterfactual outcomes with GAN and then learn an inference model with attention mechanism, which is capable of estimating these counterfactuals for new samples.

2020-2021 **Spiking Neural Network Based Super-Resolution for Event-Stream Vision**

Advisor: Dr. Yue Gao

- Event cameras are vision sensors that record asynchronous streams of per-pixel brightness changes. They own attractive advantages over frame-based cameras for computer vision, including high temporal resolution, high dynamic range, and no motion blur. However, no method focus on superresolution of such data type.

- In this work, we redefine super-resolution of event-based data and propose an Spiking Neural Network to process event-stream in the spatiotemporal channel. The method have advantages over supervised learning in both spatial and temporal channels. This work leaves many potential.

2019-2020 **Blind Video Super Resolution with Iterative Correction**
Advisor: Dr. Chao Dong

- Previous deep learning based Super-Resolution methods employ the popular bicubic downsampling strategy to artificially generate a corresponding low-resolution image. However, this strategy introduces significant artifacts, removing natural sensor noise and other real-world characteristics.
- In this work, we propose an Iterative Correction method for unknown degradation settings (blur kernel, noise, compression) estimation in a blind video SR problem. We draw the observation that kernel mismatch could bring regular artifacts (either over-sharpening or over-smoothing), which can be applied to correct inaccurate blur kernels.

2018-2019 **Image Inpainting Based on Deep Learning (*Outstanding Undergraduate Thesis Award*)**
Advisor: Dr. Fei Qi

- This research is meant to consolidate research efforts about image inpainting using learning, especially the deep learning approach.
- For two different tracks: error concealment and object removal, we inpaint the incomplete image.
- In the first track, we want to recover the missing areas so that the completed image is similar to the original, and in the second track, we are satisfied as long as the completed image is visually plausible and pleasing. The research is ICME 2019 Grand Challenge.

2018-2019 **Image Feature Extraction on Irregular Region**
Advisor: Dr. Chunna Tian

- Collected images of all the National Emblems around the world.
- Used LBP, HoG, SIFT, and other classic methods to extract features of images.
- kNN was applied to classifying different emblems' features.
- Implemented the following algorithms by C++ & Python.

2017-2018 **CT System Parameter Calibration & Imaging (*Mathematical Contest in Modeling in International-National-School Wide*)**
Advisor: Dr. Yinfeng Li

- Self-taught 2D analytical geometric models & Radon transforms.
- Used the TOPSIS, hidden Markov & other models to predict urban intelligence development.

2018 **Image Processing Based on Industrial Cameras (Research on Imaging Electronics Experiments)**
Advisor: Dr. Yin Niu

- Worked on industrial camera control, image processing & front-end interface design using Visual Studio (C++), QT & OPENCV.
- Primarily responsible for the theoretical processing & programming.

2017-2018 **Birdsongs Recognition (http://sweety-birdsong-recg.cc), National University Computer Design Contest**
Advisor: Dr. Yinfeng Li

- Independent research & development project designing an online system & website to identify birdsongs.
- The process included format conversion (FFmpeg), speech enhancement (MMSE-LSA), feature extraction (MFCC) & training using the hidden Markov model.
- Used the Viterbi algorithm to find the best state sequence & the corresponding bird call with the maximum posterior probability criterion.
- Website back-end built with Python-Flask and Nginx for the reverse proxy server and assessed the market viability of the product.

2016-2017 **Portable Printing Robot, National College Student Innovation Training Program**
Advisor: Dr. Jun Deng

- Created a portable printing robot controlled using LabVIEW with an HP print head and programmed an STM32 microcontroller.
- Wrote a visual APP interface & an Android program enabling Bluetooth control
- Currently seeking a national utility model invention patent.
- Taking the project to a national-level innovation cultivation project.

CONFERENCE AND PRESENTATION

Chao Dong. Yu Qiao. Wenlong Zhang. Ruicheng Feng & **Yuanjun Chai**. ICCV 2019. Invited Scholar and Poster. Seoul. Korea. 2019

Chao Dong. Yu Qiao. Xintao Wang. Jingwen He & **Yuanjun Chai**. Workshop NTIRE19. CVPR 2019. Invited Scholar and Team Assistant. Long Beach. US. 2019

Chao Dong. Yu Qiao & Yuanjun Chai. "Adjustable Image Stylization Software." China Hi-Tech Fair 2019. Invited Scholar and Software Assistant. Shenzhen. China. 2019

EMPLOYMENT & MEMBERSHIP

2019-2020 **Founder and Maintainer, Group Website** (http://xpixel.group/), **Multimedia Laboratory at SIAT-CAS & CUHK, Institute of Advanced Computing and Digital Engineering**

- Master the front-end skills (HTML, CSS, JavaScript, Bootstrap) and back-end framework (Flask, Jekyll) needed to build the website, understand the development path of image/video quality enhancement.
- Build and maintain the group website, collect and sort out the team information and related academic news, design the layout and content display of the site, deploy the site and update the relevant news in time.

2019-2020 **Teaching Assistant, Institute of Advanced Computing and Digital Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences**

- Assist teachers to complete PRML (pattern recognition and machine learning) teaching tasks for graduate students of Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences
- Be responsible for scoring students' significant assignments (linear regression, logistic regression, decision tree, SVM), scoring final defense of the course (PIRM2018).

2017-2019 **Associate Director, Innovation and Entrepreneurship Lab, National Electronic and Electrical Experiment Center**

- Be responsible for the daily management of the laboratory, reasonably allocated the laboratory resources.
- Led the laboratory members to cooperate with the company to operate the project and assist with the school to complete the selection and training of NI organization / National University Computer Design Contest.

2018-2019 **Server Management Member, Key Laboratory of Intelligent Perception and Image Understanding, Ministry of Education, China**

- Allocated server resources, maintained stable operation of the server, managed server permissions, cleared redundant memory in time, and scheduled GPU usage.

2017 **Member of Admission Committee, Xidian University, China**

- Assisted the professors of the admission committee in reviewing the scores to ensure that the applications were accurate and could be accepted.

REFEREE

Referee 1	**Referee 2**	**Referee 3**
Dr. Chao Dong	Dr. Yue Gao	Dr. Fei qi
Associate Professor	Associate Professor	Associate Professor
SIAT, CAS	Tsinghua University	Xidian University
chao.dong@siat.ac.cn	gaoyue@tsinghua.edu.cn	fred.qi@ieee.org