

Jia Kang

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EDUCATION

Columbia University in the City of New York (CU)

M.S. in Biomedical Engineering, School of Engineering and Applied Science

New York, NY

Aug 2019 – Dec 2020

- **GPA:** 4.0/4.0
- **Relevant Courses:** Biomedical Imaging, Computational Neuroscience, Computational Modeling of Physiological Systems, Biomedical Signal Processing and Signal Modeling, Quantitative Physiology, Sparse Models for High-Dimensional representation, Numerical Analysis, Reinforcement Learning, Statistical Machine Learning for Genomics

Shanghai Jiao Tong University (SJTU)

B.S. in Information Engineering, Department of Electronic Engineering

Shanghai, CN

Sept 2015 – June 2019

- **GPA:** 3.69/4.0
- **Honors:** Outstanding Graduate (2019), 3 consecutive years of Academic Excellence Scholarships (2016-2018), Excellent Student Leader (2017)
- **Relevant Courses:** Digital Image Processing, Machine Learning, Big Data Mining, Data Structures and Algorithms, Programming in C++, Database and SQL, Probability and Statistics, Convex Optimization, Overview of Cancer

University of Melbourne (UMelb)

Exchange Student

Melbourne, AU

June 2017 – July 2017

- **GPA:** H1 (First Class Honors)
- **Relevant Course:** Signals and Systems

SKILLS

- **Programming:** MATLAB, Python, R, C/C++, SQL, VHDL, Verilog
- **Deep Learning:** Pytorch, Tensorflow, Keras
- **Editing:** Microsoft Office, LaTeX, Markdown, Adobe Photoshop

RESEARCH EXPERIENCES

Columbia University in the City of New York

Exploring Connectivity Maps in the Mouse Brain by Microscopic Images

New York, NY

Oct 2019 – Present

Advisor: Alex Dranovsky, Andrew Laine

- Constructed a workflow for the 3D detection and analysis of neuron numbers in different regions of mouse brain with microscopic images, and integrating the pipeline into a Python package to automate the process.
- Preprocessed and registered mouse brain to the Allen Brain Atlas using active contour algorithm, feature based alignment and Elastix.
- Developed a “blob structure detection and cell segmentation” path for cell counting in brain slices with 3 steps, which can get rid of the unbalanced distribution problem.

Automatic Lumen/Wall Volume Ratio Measurement on Pulmonary Vessels by CT Scans

Mar 2020 – June 2020

Advisor: Andrew Laine, R. Graham Barr

- Employed multi-scale Hessian-based vessel enhancement method and graph-cut algorithm to enhance and binarize the 3D CT images and segmented the vessel structure out.
- Implemented multi-material decomposition to derive the component maps from dual energy CTs.
- Designed an adaptive thresholding method along the centerline of the vessel tree in order to overcome the uneven distribution of contrast agent.

Shanghai Jiao Tong University

Tracing Operation Handle in VR-AR Surgery in 3D Space

Advisor: Hongkai Xiong

Shanghai, CN

Sept 2017 – June 2019

- Invented a deep-learning based method to help HoloLens track and predict the position and posture of the handle in VR-AR surgery system, which increased the precision to 97.5% and the speed to about 46 fps.
- Employed dual dictionary learning and sparse representation method to solve the 6D pose estimation problem, which can be used to guide the movement of the probes inside patients' airway.
- Implemented the work of *waveOne*, an image/video compression framework for digital media.

Knowledge Graph Mining

Advisor: Weinan Zhang

Apr 2018 – June 2018

- Explored latent links based on known relationships among entities in knowledge graphs.
- Built and trained a model to predict possible connections among scholars, papers, and academic institutions in Acemap, an academic knowledge graph containing more than 1 billion entities.

Fingerprint Mapping of Liquors by Machine Learning

Advisor: Fei Tao

Jan 2016 – Mar 2017

- Conducted liquid-liquid extraction and solid-phase micro-extraction of 11 different kinds of alcohols.
- Built classifiers to distinguish liquor's types and brands with mass spectrometric data from GC×GC-TOFMS analysis.

PROFESSIONAL EXPERIENCES

Siemens Ltd. China

Image Processing R&D Intern

Supervisor: Jiming Wang, Department: DI MC OEC ENG

Shanghai, CN

Dec 2018 – June 2019

- Created a core image detection module based on YOLO algorithm for the company's 3 anti-rolling systems and 1 port obstacle detection system.
- Designed an instance segmentation algorithm based on Mask R-CNN, and it has been applied in the company's unmanned crane control system.
- Solved the current shortage of skilled mechanical operators by these newly-developed automatic control systems equipped with above algorithms.

LEADERSHIP EXPERIENCES

Academic Sharing Center, Student Union at SJTU

Director

Shanghai, CN

Dec 2017 – Dec 2018

- Led a team of 15 to prepare for a series of activities with a theme of "2018 world book day", including reading salons, bookcrossing in campus, lectures and seminars of well-known writers, essay collection from social medias.
- Organized 9 on-campus and inter-university speech contests and debate competitions.
- Hosted a number of forums and debates with an audience of hundreds.

Inspiration Forum at SJTU

Team leader

Shanghai, CN

Sept 2015 – Sept 2016

- Designed posters, flyers and web images using Photoshop for publicity.
- Invited celebrities and alumni from politics, academia and business to join forums, and chaperoned for guest speakers.
- Edited press releases, thank-you notes, publicity articles for activities.