

Sikun LIN

PHD CANDIDATE · UNIVERSITY OF CALIFORNIA, SANTA BARBARA

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Programming Languages: Python, Matlab, C++, R, Java, Javascript
ML libraries: PyTorch, Keras, Tensorflow, Caffe2

Education

University of California, Santa Barbara

CA, US

PHD IN COMPUTER SCIENCE, MAJOR AREA EXAM PASSED ON DEC. 2019

Sep. 2017 - Present

- GPA: 4.0

Hong Kong University of Science and Technology

Hong Kong

MPhil in Computer Science and Engineering

Sep. 2015 - Jun. 2017

- Graduated with First Class Honors.

Hong Kong University of Science and Technology

Hong Kong

B.S. in Physics and Mathematics (Double Major)

Sep. 2011 - Jun. 2015

- Minors: Humanity & Social Science.
- Graduated with First Class Honors.

The University of British Columbia

Vancouver, Canada

Exchange in the Faculty of Science

Jan. 2014 - Apr. 2014

Work Experience

Mentor @ UCSB EUREKA! program

JUN. 2020 - PRESENT

- Mentoring undergrad on brain imaging research. The project we designed aims for assessing Alzheimer's progression with ADNI data by applying Siamese graph convolutional networks.

Research Intern @ Markable.ai

JUN. 2019 - SEP. 2019

- Object feature fusion from multiple images/frames using graph neural networks with attention mechanisms, as well as quality selection techniques used in person re-identification.
- White noise analysis of neural networks for better network understanding, which is inspired by classification images and spike-triggered averaging techniques in neuroscience. (*Paper accepted to ICLR2020*)

Research Intern @ Markable.ai

JUN. 2018 - SEP. 2018

- Instance segmentation of fashion items using weakly supervised learning.
- Visualization of neural network model representations.
- New direction explorations: NAS (neural architecture search), and Low-shot learning (including meta-learning and metric learning).
- Machine learning library used: PyTorch, Caffe2

Teaching Assistant

- WNTR 2020: CS165B - Machine Learning @ UCSB
- WNTR 2018: CS165A - Artificial Intelligence @ UCSB
- FALL 2017: CS180 - Computer Graphics @ UCSB
- FALL 2016: COMP4331 - Data Mining @ HKUST

Research Experience

Joint modeling of EEG, fMRI and structural MRI

Prof. Ambuj K. Singh

PHD RESEARCH, WORKING PAPER

Mar. 2020 - Now

- Combining high temporal resolution EEG and high spacial resolution fMRI for better brain activity modeling.
- Using structural data as the underlying network.
- Using spatial-temporal graph neural networks to solve the time series prediction and signal source localization problem.

Revisiting Graph Convolutional Networks with Relational Neighbor Voting

Prof. Ambuj K. Singh

PHD RESEARCH, PAPER SUBMITTED TO AAAI ON SEP. 2020

Nov. 2019 - Feb. 2020

- Interpreting the mechanism of GCN as a relational neighbor voting strategy.
- Aggregating information from every relational neighborhood by a lazy random walk, with attention mechanism.
- Propose a new GCN model called RN-Net and proposes its approximation for efficiency.

Learning Interpretable Models for Coupled Brain Networks Under Domain Constraints

Prof. Ambuj K. Singh

PHD RESEARCH, PAPER SUBMITTED TO AAAI ON SEP. 2020

Mar. 2018 - Jan. 2020

- Data used: Human Connectome Project (HCP) MRI data.
- Investigating interactions between structural and functional edges through their likelihood formulation.
- Solve constrained optimization objective through nested FISTA.
- Modeling brain network models across different tasks using optimization approach with network constraints.

Similarity Network for One-shot one-class learning

Prof. Matthew Turk

PHD RESEARCH

Feb. 2018 - July. 2018

- Solving the granularity problem in image classification using Triplet-like Similarity Networks.
- Finding the optimal branch number and an effective loss function.
- Visualizing the attention area of the Similarity Network.

DeepCoin: Useful Proof-of-Work

Prof. Amr El Abbadi

GRADUATE COURSE PROJECT

Feb. 2018 - Mar. 2018

- Replace Bitcoin's PoW from finding nonce to training neural networks.
- Build a simple blockchain using our PoW mechanism: node.js for blockchain and Python-Keras for neural networks.
- Experiment over three training tasks.

Personalized Attention

Prof. Pan Hui

MASTERS THESIS

Dec. 2016 - Jun. 2017

- Finding the salient regions in incoming image frames based on personal preference, thus providing better user experience in HCI.
- Combined saliency prediction and object detection (SSD) techniques to build a single CNN for accomplishing the required task.
- Model built using TensorFlow and Keras, trained on augmented MS COCO dataset.
- Thesis: [\[File Link\]](#)

CloudRidAR: A Cloud-based Architecture for Mobile Augmented Reality (MAR)

Prof. Pan Hui

MPhil RESEARCH, SUBMITTED PAPER

Feb. 2016 - Oct. 2016

- CloudAR is a framework for developers to develop, deploy and perform maintenance of MAR applications more easily.
- Developed the computer vision module of the framework.
- Implemented a fast and high mAP image retrieval pipeline by combining binary image descriptors, FV encoding and LSH.
- Designed the Tracking-Recovery algorithm for recovering the position offsets caused by offloading.

Ubii: Ubiquitous interface and interaction

Prof. Pan Hui

MPhil RESEARCH, SUBMITTED PAPER

Aug. 2015 - Feb. 2016

- Developed an AR system on wearable devices that provides a more natural way of interaction with multiple devices.
- Implemented the overall system (Android platform), and server side vision algorithms, including hand detection, gesture recognition, device pose estimation and tracking.

Evolutionary Computation for Optimization

Prof. Kwok Yip Szeto

UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (UROP)

Sep. 2013 - Jan. 2014

- Research project using genetic algorithms to optimize Random Walk Problems in complex networks.
- Developed programs for the Random Walk simulations and data analysis.

ASM conjecture and Gog, Magog triangles

Prof. Yilong Han

UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM (UROP)

May 2012 - Sep. 2012

- Research project to study the geometry expression of ASM conjectures, including major sphere stacking models and their implications.
- Developed programs to collect and analyze the data of different configurations.

Publications

- You, H., Lin, S., Singh, A. *Learning Interpretable Models for Couple Networks Under Domain Constraints*. Under submission.
- Ye, W., Lin, S., Singh, A. *Relational Neighbor Networks for Semi-supervised Classification*. Under submission.
- Borji, A., Lin, S. *White Noise Analysis of Neural Networks*. *ICLR 2020* [\[Paper Link\]](#)
- Zhang, W., Lin, S., Bijarbooneh, F. H., Cheng, H. F., Hui, P. *CloudAR: A Cloud-based Framework for Mobile Augmented Reality*. *Thematic Workshops'17, Oct. 23-27, 2017, Mountain View, CA, USA* [\[Paper Link\]](#)

- **Lin, S.**, Cheng, H. F., Li, W., Huang, Z., Hui, P., & Peylo, C. *Ubii: Physical World Interaction Through Augmented Reality*. *IEEE Transactions on Mobile Computing*, ISSN :1536-1233, 13 May 2016. [\[Paper Link\]](#)

Honors & Awards

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|-----------|--|---------------------------|
| 2017-2018 | Lopker Family Foundation Fellowship | UCSB |
| Dec. 2016 | 2nd place in Global AI Hackathon held by IBM | Korea |
| 2015-16 | HKTIT Post-Graduate Excellence Scholarships | Hong Kong |
| 2012-15 | Scholarship Scheme for Continuing Undergraduate Students | HKUST |
| 2013-14 | Shun Hing Group Scholarships | Hong Kong |
| 2012-14 | Dean's List Awardee | HKUST |
| 2011-12 | School of Science Scholarship | HKUST |

Activities

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|-----------|---|--|-----------------------------------|
| Jun. 2020 | Neuromatch Academy (NMA) summer school volunteer | Lecture and tutorial videos editing | Online |
| Sep. 2019 | 2019 Grace Hopper Celebration | | Orlando, FL |
| Apr. 2018 | CRA-W Grad Cohort for Women workshop | | San Francisco, CA |
| Jan. 2015 | Service Learning Trip to Cambodia | Activities design & Teaching | Cambodia |
| Jun. 2013 | Volunteer in Nepal | Teaching & Organizing | Nepal |
| 2012-2013 | Volunteer in Hong Kong | Elderly center & Flag sale & English Day | Hong Kong |
| 2011-2014 | Mainland Students and Scholars Society (MSSS) | Executive committee: Promotion Secretary | HKUST |
| 2011-2012 | Student Social Service Society (SSSS) | Sub-committee | HKUST |