KAI CHEN

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EDUCATION

Hong Kong University of Science and Technology, HK, China *Sep 2020 - Jun 2025 (Expected)*
(Coming) Ph.D. in **Computer Science and Engineering**
Advisor: Prof. Qifeng Chen and Prof. Dit-Yan Yeung

Fudan University(FDU), Shanghai, China *Sep 2016 - Jun 2020*
B.S. in **Computer Science**, Minor in **Economics**
Overall GPA: 3.68/4.0, Major GPA: 3.90/4.0, Ranking: 3/32
Advisor: Prof. Yanwei Fu

University of Manchester, Manchester, UK *Sep 2018 - Jan 2019*
Undergrad Exchange student in the Department of Computer Science for One Semester
Advisor: Dr. Tingting Mu

PUBLICATIONS

- Md. Alimoor Reza, **Kai Chen**, Akshay Naik, David Crandall, and Soon-Heung Jung. Automatic Dense Annotation for Monocular 3D Scene Understanding. *IEEE Access Journal (IEEE Access), 2020* [link]
- Md Alimoor Reza, Akshay Naik, **Kai Chen**, David Crandall. Automatic Annotation for Semantic Segmentation in Indoor Scenes. *IEEE International Conference on Intelligent Robots and Systems (IROS),2019* [link]

HONORS

National Scholarship for Outstanding Students (1%, by Ministry of Education of P.R.China)	Sep 2018
Outstanding Graduates of Shanghai [Wechat Push] (5%, by Shanghai Government)	April 2020
Scholarship for Outstanding Graduates (5%, by Fudan University)	April 2020
Fudan Oversea Visiting Student Stipend (15,000 CNY)	Dec 2019
Joel & Ruth Spira Scholarship (1%, by Lutron Electronics)	Mar 2019
Scholarship for Outstanding Undergraduate Students (5%, by Fudan University)	Oct 2017
Outstanding undergraduate of Fudan University (10%)	April 2020 & May 2018 & Oct 2017
1st Prize - "ChuangQingChun" Enterprising Competition FDU Division(10%)	Feb 2018

INTERNSHIP

SenseTime, Mobile Intelligence Group (MIG) Oct 2019 - April 2020
Research Intern *Advisor:Dr. Wenxiu Sun, Sensetime*

· Research on (portrait) instance segmentation algorithms, especially focusing on real time implementation which can be deployed on mobile devices.
· Based on *Personlab* [link], we build an augmented bottom-up instance segmentation method which specilizes in person segmentation. We try to do semantic segmentation and keypoint detection on person class first and then use a heuristic way to group human pixels and change keypoint-level instances to pixel-level instances.
· Code will be used in our group's lastest products.

Indiana University Bloomington (IUB), Computer Vision Lab June 2019 - Sep 2019
Visiting Scholar *Advisor:Prof. David Crandall, IUB*

· Global Talent Attraction Program (GTAP) Scholar of Indiana University Bloomington Computer Vision Lab.
· Research in semi-supervised semantic segmentation, ego-motion video understanding, neuroscience inspired by human beings and 3D reconstruction. More details in my blog: [link].

RESEARCH EXPERIENCE

MetaIRNet++: Augmented One-Shot Fine-grained Image Recognition April 2020 - June 2020
Undergrad Graduation Thesis *Advisor:Prof. Yanwei Fu, FDU*

- Based our lab's formal work [link], we try to solve one-shot fine-grained image recognition problems by fusing two popular methods: meta learning and differentiable data augmentation.
- Following the differentiable image block augmentation, we use meta learning to teach the model how to generate synthesized images which can really improve one-shot recognition instead of over-fitting, even if they might not seem very realistic.
- Also we try to use *Siamese Network* and *Block Dropout* to improve the original model from two perspectives, decreasing the amount of parameters and increasing the robustness of global inconsistent synthesized images correspondingly.
- Together we propose the final **MetaIRNet++** and successfully improve one-shot recognition accuracy significantly at the same time of decreasing at least 1/3 of model parameters.

Automatic Annotation for Semantic Segmentation in Indoor Scenes June 2019 - Sep 2019
Undergraduate Research *Advisor:Dr. Md Reza and Prof. David Crandall, IUB*

- Motivation: Expensive to get image semantic labels manually, so it's necessary to generate image semantic annotation automatically without any ground truth labels. Using together with human annotation, we hope we can get a better segmentation (e.g. FCN) model.
- Idea: Structural scene understanding separates an image to 2 parts first: foreground and background. We use Mask RCNN to detect foreground objects and 3D layout segmentation estimator to capture background information separately. Then we gather this two information together using a well-defined energy function to find best annotation.
- Summary our work into a paper accepted by *IROS 2019* as third author (see details above).
- Now we are trying to find a way to *fine tuning* our Mask RCNN detector using only generated pseudo labels without access to any ground truth to decrease domain gap and improve performance.

Link Prediction on Weighted Signed Social Network July 2018 - April 2019
Undergraduate Research *Advisor:Prof. Yitong Wang, FDU*

- Focus on link prediction problems in Weighted Signed Social Network (WSN).
- Come out an algorithm called MFLG, a new network embedding algorithm based on matrix factorization. We embed each node with two vectors, one *subjective* one *objective*.
- We use *random walk* to get related node pairs which aren't connected directly to combine global social network features with local features (adjacent node pairs).
- We add regularization to get correct sentiment results when two predictions have same square error (e.g. assume the ground truth is 1, we prefer 3 instead of -1).
- Use different algorithms' prediction as features to train a linear regression model and get a more robust model.
- Summarize our work into a paper as the third author (still waiting for notification).

TECHNICAL SKILLS

Program Languages	Python, Matlab, C/C++/C#, SQL, LaTeX
Framework	Pytorch, Tensorflow
Language	Native in Mandarin Chinese, Fluent in English and New Interest in Japanese CET-4(649), CET-6(619), TOEFL-iBT(101), IELTS(6.5)