# Shuhao Fu

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## Education

**University of California, Los Angeles** — Los Angeles, CA
*Ph.D. in Computational Cognition* — Sept 2020 - Present

**The Hong Kong University of Science and Technology** — Hong Kong
*B.S. in Computer Science and Mathematics* GPA: 3.76/4.3 (top 5%) — Sept 2014 - Jun 2019

**ETH Zurich** — Zurich
*Exchange student in Computer Science and Engineering* — Sept 2016 - Feb 2017

## Awards

HKUST University Scholarship — 2014 - 2019
Dean's List Student (GPA above 3.7/4.3, top 5%) — 2014-17
Lee Hysan Foundation Exchange Scholarship — 2017
HKSAR Government Scholarship Fund – Reaching Out Award — 2017

## Publications

Fu, S., Lu, Y., Wang, Y., Zhou, Y., Shen, W., Fishman, E., & Yuille, A. (2020). Domain adaptive relational reasoning for 3d multi-organ segmentation. *Proc. International Conference on Medical Image Computing and Computer Assisted Intervention*.

Dreizin, D., Zhou, Y., Fu, S., Wang, Y., Li, G., Champ, K., ... Yuille, A. L. (2020). A multiscale deep learning method for quantitative visualization of traumatic hemoperitoneum at ct: Assessment of feasibility and comparison with subjective categorical estimation. *Radiology: Artificial Intelligence*, *2*(6).

Fu, S., Xie, C., Li, B., & Chen, Q. (2020). Attack-resistant federated learning with residual-based reweighting. *Proc. Towards Robust, Secure and Efficient Machine Learning (oral)*.

Ichien, N. T., Liu, Q., Fu, S., Holyoak, K. J., Yuille, A. L., & Lu, H. (2021). Visual analogy: Deep learning versus compositional models. *Under review*.

## Research Experience

**Visual Analogy** — Jun 2020 - Ongoing
*Research Assistant, Supervisor: Hongjing Lu*

- Implemented two deep learning networks to evaluate their ability in visual analogy tasks.
- Submitted a paper to Cognitive Science Society conference titled as "Visual Analogy: Deep Learning Versus Compositional Models".

**Social Avoidance** — July 2020 - Ongoing
*Research Assistant, Supervisor: Hongjing Lu*

- Investigating the factors in the perception of social avoidance.

**Johns Hopkins University** — Jun 2019 - Sep 2020
*Research Assistant, Supervisor: Alan Yuille*

- Designed a domain adaptation framework with an auxiliary self-supervised learning task with relational reasoning ability.
- Published a paper to MICCAI 2020 titled as "Domain Adaptive Relational Reasoning for 3D Multi-Organ Segmentation".

**Attack Resistant Federated Learning** — Sept 2018 - Sept 2019
*Final Year Thesis, Supervisor: Qifeng Chen*

- Proposed an algorithm with residual-based reweighting that robustly aggregate hundreds of models in federated learning.
- Our approach maintained robust under model poisoning attacks and noisy attacks in variant tasks including NLP and Image Classification.
- Theoretically proved the robustness of our aggregation algorithm.

**Momenta.ai** — Nov 2017 - May 2018
*Research Intern, Supervisor: Shaoqing Ren*

- Developed different Alignment Networks for car detection, which regresses bounding boxes proposed by Faster R-CNN in a more stable and efficient manner.
- Systematized the evaluation process of Alignment Networks' performances with new criteria based on stability and efficiency.

**Microsoft Research Asia** Jun 2017 - Nov 2017

*Research Intern, Supervisor: Jifeng Dai*

- Reimplemented code of Flow-Guided Feature Aggregation in MXNet platform and officially released it.
- Designed an algorithm leveraging color, texture and optical flow to tackle instance segmentation problem in videos with semi-supervised annotation.

## Skills

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|---|---|
| Programming Languages: | Python, C/C++, Java |
| Frameworks & Tools: | Pytorch, Caffe, MXNet, TensorFlow, LaTeX, Git, Linux |
| Languages: | Chinese (Native), English (Professional working proficiency) |