

# Xutong Ren

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https://tonghelen.github.io/

## EDUCATION

### Peking University

Bachelor of Science in Computer Science.

Beijing, China  
Sept. 2015 – July 2019

- GPA: 3.65/4.00; Major GPA: 3.81/4.00; Student of Top Notch Class of EECS.
- Core Courses  
Advanced Mathematics (96); Algebraic Structure and Combinatorial Mathematics (97); Operating Systems (98);  
Principle of Programming Languages (96); Computer Network Practicum (95); Computer Architectures(94).
- TA: Introduction to Computer Systems.
- Volunteer: Beijing Volunteer Service Federation; The Global FoodBanking Network.

## PUBLICATION

- [1] Chen Wei, Lingxi Xie, **Xutong Ren**, Yingda Xia, Chi Su, Jiaying Liu, Qi Tian and Alan Yuille, “Iterative Reorganization with Weak Spatial Constraints: Solving Arbitrary Jigsaw Puzzles for Unsupervised Representation Learning,” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.
- [2] **Xutong Ren**, Mading Li, Wen-Huang Cheng and Jiaying Liu, “Joint Enhancement and Denoising Method via Sequential Decomposition,” *IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2018, pp. 1–5. (oral)
- [3] **Xutong Ren**, Lingxi Xie, Chen Wei, Siyuan Qiao, Chi Su, Jiaying Liu and Alan Yuille, “Progressive Recurrent Learning for Visual Recognition,” *Arxiv e-print 1811.12047*.
- [4] **Xutong Ren**, Wenhan Yang, Wen-Huang Cheng, Jiaying Liu, “LR3M: Robust Low-Light Enhancement via Low-Rank Regularized Retinex Model,” submitted to *IEEE Transactions on Image Processing (TIP)*.

## PATENT

- [1] Jiaying Liu, **Xutong Ren**, Mading Li, Zongming Guo, “Method, System and Computer Device of Low-light Enhancement and Denoising,” CN201810243551.9

## RESEARCH EXPERIENCE

### Research Assistant

Institute of Computer Science and Technology, Peking University.  
Advisor: Prof. Jiaying Liu, PKU.

Beijing, China  
May 2017 – present

- **Low-light Image Enhancement and Denoising**
  - Proposed a joint low-light enhancement and denoising strategy based on a novel sequential Retinex decomposition concept.
  - Combined low-light enhancement method and low-rank denoising approach in order to improve the quality of images and videos.
  - Demonstrated the reason why solving the Retinex decomposition problem iteratively causes noise to distribute in each component, which in the end impairs the denoising ability.
  - This project was written in MATLAB and published in *ISCAS*. It was extended and submitted to *TIP*.

### Research Intern

Center for Imaging Science, Johns Hopkins University.  
Advisor: Prof. Alan Yuille, JHU.

Baltimore, MD, U.S.  
July 2018 – Sept. 2018

- **Representation Learning via Jigsaw Puzzle**
  - Built a recurrent solution to jigsaw puzzles of arbitrary permutations in a self-supervised manner.
  - Used binary loss to enforce the neural network to learn from spatial contexts of puzzles and transferred the learned features to visual tasks such as 3D medical image analyses. This paper is published in *CVPR*.
- **Progressive Recurrent Learning**
  - Proposed a progressive learning method, following an organized learning order by gradually reducing ground truth information given to the network.
  - Demonstrated that this method can be applied to different visual tasks and bring gains of 1-5% in object localization, semantic detection, and segmentation. This project was based on Torch and PyTorch, and the paper is available at *Arxiv 1811.12047*.

## HONORS

- Best Technical Project Award at Google AI ML Winter Camp 2019
- Peking University Award for Academic Excellents 2018, 2017
- Wang Shengdi Scholarship (top 10%) 2018
- 8108 College Scholarship (top 10%) 2017
- The Third Prize of Peking University ACM ICPC 2017
- Peking University Award for Excellent Volunteers 2016

## SKILLS

- PyTorch, Torch, MXNet
- C/C++, Python, MATLAB, Lua, Java, JavaScript, Go, HTML, Wolfram, Arduino