

# 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] **Xutong Ren**, Mading Li, Wen-Huang Cheng and Jiaying Liu, “Joint Enhancement and Denoising Method via Sequential Decomposition,” in *IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2018, pp. 1–5. (**oral**)
- [2] **Xutong Ren**, Lingxi Xie, Chen Wei, Siyuan Qiao, Chi Su, Jiaying Liu and Alan Yuille, “Progressive Recurrent Learning for Visual Recognition,” submitted to *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*.
- [3] **Xutong Ren**, Wenhan Yang, Jiaying Liu, “LR3M: Robust Low-Light Enhancement via Low-Rank Regularized Retinex Model,” submitted to *IEEE Transactions on Image Processing (TIP)*.
- [4] 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,” submitted to *CVPR*.

## 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*. The paper and code are available at <http://www.icst.pku.edu.cn/course/icb/Projects/JED.html>. 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

- **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 was submitted to *CVPR*.
- **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 was submitted to *CVPR*.

## HONORS

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| • Peking University Award for Academic Excellents  | 2018 |
| • Wang Shengdi Scholarship (top 10%)               | 2018 |
| • Peking University Award for Academic Excellents  | 2017 |
| • 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