Xutong Ren

5 Yiheyuan Road
Beijing, P.R. China, 100871

tonghelen@pku.edu.cn
https://tonghelen.github.io/

EDUCATION

Peking University   Beijing, R.P.China
Bachelor of Computer Science, EECS.   Sept. 2015 – July 2019

- GPA: 3.61/4.00.

- Special Research Class of EECS.

- Core Courses
  - Mathematics:
    Advanced Mathematics (96); Algebraic Structure and Combinatorial Mathematics (97);
  - Computer Science:
    Operating Systems (98); Principle of Programming Languages (96);
    Computer network practicum (95); Computer Architectures(94);
  - Programming:
    Introduction to Computation (95); Practice of Programming in C/C++ (95).

- TA: Introduction to Computer Systems

PUBLICATION

[1] **Xutong Ren**, Mading Li, Wen-Huang Cheng and Jiaying Liu, "Joint Enhancement and Denoising Method via Sequential Decomposition," in *2018 IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2018, pp. 1–5. (**oral**)

[2] **Xutong Ren**, Lingxi Xie, Chen Wei and Alan Yuille, "Recurrent Curriculum Learning ," prepare to submit to *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.

[3] **Xutong Ren**, Wenhan Yang, Jiaying Liu, "J3LR: Joint Low-Light Enhancement and Low-Rank Denoising Method," prepare to submit to *IEEE Transactions on Image Processing (TIP)*.

[4] Chen Wei, Lingxi Xie, **Xutong Ren**, Alan Yuille,"Unsupervised Visual Recognition by Solving Arbitrary Jigsaw Puzzles," prepare to submit to *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.

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.   Beijing, China
Advisor: Prof. Jiaying Liu, PKU.   May 2017 – present

- **Low-light Image Enhancement and Denoising**
  - Solve the problem that low-light enhancement methods ignore intensive noise in original images which leads to simultaneously enhance the noise as well.
  - Propose a joint low-light enhancement and denoising strategy based on a novelsequential Retinex decomposition concept.

- ○ Perform well for a wide variety of images, and achieve better quality compared with the state-of-the-art methods. The paper and code are available at http://www.icst.pku.edu.cn/course/icb/Projects/JED.html.
- ○ Bring up the idea, code in MATLAB and publish a paper [1] as the first author.
- **Joint Low-light and Low-rank Algorithm**
  - ○ Explain and demonstrate why solving the Retinex decomposition problem iteratively causes noise to distribute in each component, which in the end impairs the denoising ability.
  - ○ First to combine low-light enhancement method and low-rank denoising approach in order to improve the quality of images. An integrated low-rank decomposition of three channels in RGB space is applied to remove noise from the reflectance map.
  - ○ Bring up the idea, code in MATLAB and write a paper [3] as the first author.

Research Intern

Center for Imaging Science, Johns Hopkins University.   Baltimore, U.S.
Advisor: Prof. Alan Yuille, JHU.   July 2018 – Sept. 2018

- **Recurrent Curriculum Learning**
  - ○ Propose a new form of Curriculum Learning, which follows an organized learning order by gradually reducing oracle information given to the network.
  - ○ Design a general two-stage network model, using outputs of coarse stage to replace oracle information given to fine stage and increase learning difficulty.
  - ○ Apply to different visual tasks such as object detection, segmentation and classification.
  - ○ Bring up the idea, code in Torch and MatCaffe, and prepare to submit a paper [2] as the first author.
- **Transfer Learning via Jigsaw Puzzle**
  - ○ Build a recurrent solution to a jigsaw puzzle of 9! different permutations in a self-supervised manner, without heavy burden of human annotation.
  - ○ Enforce the neural network to learn from spatial contexts of puzzles and transfer the learned features to visual tasks such as medical image analyses.
  - ○ Prepare to submit a paper [3] as the third author.

Honors

- 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 Competition   2017

Skills

- **Deep Learning**
  PyTorch, MXNet, Torch.
- **Programming**
  C/C++, Matlab, Python, Lua, Java, Javascript, HTML, Go, Wolfram, Arduino.
- **Robotic Design**
  Computer Science and Electrical Engineering Education Program at MIT, Boston.
- **English**
  GRE (325); TOFEL (105).