Helen Ren

https://www.linkedin.com/in/xutongren

(412)535-2277

tonghelen@pku.edu.cn

Education

Carnegie Mellon University, School of Computer Science — Pittsburgh, PA

Master of Science in Machine Learning | GPA: 4.00 | TA: Intro. to Machine Learning — Dec. 2020

Peking University, School of Electronics Engineering and Computer Science — Beijing, China

Bachelor of Science in Computer Science | GPA: 3.81 | TA: Intro. to Computer Systems — July 2019

Skills

- Programming Languages: Python, C/C++, MATLAB, Lua, (MySQL, JS, HTML);
- Frameworks: PyTorch, Torch, Linux, Jupyter.

Work Experiences

Microsoft — Redmond, WA

Data & Applied Science Intern, Security & Compliance Group — May 2020 – Aug. 2020

- Formulated phishing email detection as a visual task based on the existence of phishing templates among phishing campaigns.
- Designed and implemented a software (in $C^{\#}$ and Python) that can render synthetic phishing emails with different templates, providing large scale phishing datasets without privacy issues for product testing.
- Proposed an attention framework via class activation maps. Achieved FPR $< 0.1\%$ and TPR $> 98.5\%$ on real/synthetic data.
- Developed an advanced classifier (in PyTorch) that automatically localizes critical visual components (logos, banners, signatures) and detects phishing emails unsing global-local infomation, improve the TPR from $\sim$40% to $\sim$95% for unseen templates.
- Applied image rotation prediction to extract visual embeddings for OPTICS to distinguish email templates and do phishing campaign detection. The template detection performance achieved NMI $> 86.4\%$.

Huawei — Beijing, China

Research Intern, Noah's Ark Lab — May 2019 – Aug. 2019

- Proposed a generalized coarse-to-fine model (in Lua) with effective information passing to accommodate different image recognition tasks. Brought gains of 2% – 10% in few shot classification, object localization, biomedical semantic segmentation, etc.
- Designed a progressive training strategy to improve learning stability and relieve over-fitting, which re-defines the concept of sample difficulty. Overcame the defects of curriculum learning and made the theory feasible in practical.
- Explored the problem of scene classification with partial feedbacks and equipped current margin-based algorithms with active learning techniques, making online scene identification possible.

Research Experiences

Carnegie Mellon University — Pittsburgh, PA

Graduate Research Assistant | Advisors: Prof. Min Xu and Prof. Louis Philippe Morency — Jan. 2020 – Present

- Focused on explicitly modeling the willingness of speaking and listening for both conversational participants in the dyad interaction using trimodal inputs (acoustic, linguistic, and visual).
- Studied the impact of modeling internal status of people as a way to help improving the task of turn-changing prediction via multitask learning. This work is published in *IVA* 2020.
- Focused on developing weakly-supervised approaches to perform 3D scene understanding that benefits downstream biomedical tasks. Implemented few shot semantic segmentation for cellular component detection of cryo-ET.

Peking University/Johns Hopkins University — Beijing, China/Baltimore, MD

Undergraduate Research Assistant | Advisors: Prof. Jiaying Liu and Prof. Alan Yuille — May 2017 – July 2019

- Proposed a joint low-light enhancement and denoising strategy based on a novel sequential Retinex decomposition concept, making simultaneous processing possible and improving visual quality. This work is published in *ISCAS* 2018.
- Focused on visual representation learning in a self-supervised manner and built a recurrent solution (in TensorFlow) to jigsaw puzzles of arbitrary permutations to improve performance. This work is published in *CVPR* 2019.
- Developed a low-rank solution (in MATLAB) to solve heavily degraded low-light images. Extended low-light enhancement methodology to the video process Graduate Research Assistant. This work is published in *TIP* 2020.

Publications

[1] **Xutong Ren**, Wenhan Yang, Wen-Huang Cheng and Jiaying Liu, "LR3M: Robust Low-Light Enhancement via Low-Rank Regularized Retinex Model," in *IEEE Transactions on Image Processing (TIP)*, doi: 10.1109/TIP.2020.2984098.

[2] Ryo Ishii*, **Xutong Ren***, Michal Muszynski and Louis-Philippe Morency, "Can Prediction of Turn-management Willingness Improve Turn-changing Modeling?" in *ACM International Conference on Intelligent Virtual Agents (IVA)*, Oct. 2020.

[3] 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," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.

[4] **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. (oral)