Xiaoyu Chen（陈霄宇）

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EDUCATION

Dec 2019–Jun 2020	Nanyang Technological University	Computer Science	Research assistant
Sep 2015– present	Nanjing University of Science and Technology	Optical Engineering	Ph.D. candidate
Sep 2011– Jun 2015	Nanjing Tech University	Photoelectric Information Engineering	Bachelor

PUBLICATIONS

1, Xiaoyu. Chen, Xiaotian. Lou, Lianfa. Bai, and Jing. Han. Residual pyramid learning for single-shot semantic segmentation. IEEE Transactions on Intelligent Transportation Systems, pages 1–11, 2019. Code

2, Xiaoyu. Chen, Xu. Wang, Lianfa. Bai, Jing. Han, Zhuang. Zhao. High Sensitivity Snapshot Spectrometer Based on Deep Network Unmixing. arXive-prints, page arXiv:1907.00209. (submitted to OSA *Optica*)

3, Xiaoyu. Chen, Qixin. Wang, Jinzhou. Ge, Yi. Zhang, Jing. Han. Non-destructive three-dimensional measurement of hand vein based on self-supervised network. arXive-prints, page arXiv:1907.00215. (submitted to Signal Processing: Image Communication)

4, Haotian. Yu[co], **Xiaoyu. Chen**[co], Zhao. Zhang, Dongliang. Zheng, Jing. Han, and Yi. Zhang. Novel phase retrieval based on deep learning for fringe projection profilometry by only using one single fringe. arXive-prints, page arXiv:1906.05652. (submitted to OSA *Optics Express*, **co**: equal contributor)

EXPERIENCE

- Smart self-checkout cart (ICart). The smart cart containing 3D vision module, weighting module has anti-theft feature during shopping journeys. The key challenge is to recognize shopping behavior with visual data in various situations. Now the ICarts have been used in more than fifty supermarkets.
- Smart searching and tracking UAV (SST UAV). The SST UAV is equipped with a digital camera and a thermal imager to detect and track on both daytime and night. The flying height of our UAV is over 200m and the size of visual object is small (50~100 pixels) and low-contrast, especially in thermal images. We design a residual pyramid learning network to recognize objects from coarse to fine which achieve both efficiency and accuracy.
- Image enhancement. Our tasks generally contain three levels: (1) visual images enhancement based on HSV priors; (2) multi-spectrum images enhancement based on biology priors and (3) push the limits of perceptual: speckle imaging and 3D points cloud enhancement.

  In these tasks, we need to assess the enhancement models to better correspond to HSV, and the such assessments will also be helpful in loss evaluation in supervised learning models. Our primary experiments, which replacing the point-wise and SSIM loss with Fourier spectrum similarity loss in super resolution networks, have revealed that the better loss evaluation leads to better visual results.
- Novel spectrum imaging system with CNNs. There are many approximations in traditional optical system which lead to much redundancy. We capture the dispersive images with imaging spectrometer and directly unmix them to obtain hyperspectral images with CNNs. The novelty lies in that the spectrum reconstruction is made to be end-to-end and achieve quality results. This method also simplifies its optical structure and push for miniature.
- Novel 3d measurement with CNNs. Traditional FPP always require more than one fringe for 3d measurement, which is hard to be applied in dynamic measurement. We propose a novel phase retrieval technique combining CNNs and FPP technique for 3d measurement in a single camera shot, which shows great potential for dynamic 3d measurement.

AWARD

Second award in “Challenge Cup” National Science and Technology Works; Third award in Industry Innovation Scholarship; Third award in China Graduate Electronics Design Contest.