Chao Huang

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EDUCATION

Nanjing University, Nanjing, Jiangsu, China

- B.Eng. in Telecommunications Engineering   Sep 2015 – Jun 2019
  - Overall GPA: 4.34/5.0

RESEARCH EXPERIENCE

Non-local Attention-based Progressive 3D Point Cloud Denoising

- Virtual Reality and Imaging Research Centre, CUHK   Aug 2019 – Nov 2019
- Supervisors: Prof. Chi-Wing Fu, Philip
  - Explored non-local semantically-related features by formulating the non-local learning unit (NLU) to aggregate features in the whole 3D shape, and designed the graph attention module to consider the feature similarity and focus on aggregating features with more similar underlying geometry.
  - Progressively separated the noise features from the cleaned features by cascading a series of NLU and trained the network to encourage the points to more evenly located on the underlying surface with a shape-wise and part-wise regularization.
  - Conducted extensive experiments to quantitatively and qualitatively evaluate our method, and demonstrated its superiority over the state-of-the-arts. A first-author paper submitted to **CVPR 2020**

Extreme Image Compression

- Vision Lab, Nanjing University   Sep 2018 – Feb 2019
- Supervisor: Prof. Zhan Ma
  - Adopted generative adversarial optimization for extreme image compression that can be used in situations like communications at depth and web snapshot
  - Proposed a novel Multi-Scale AutoEncoder framework, which constructed a coarse-to-fine image coding pipeline for better preserve on global structure and local details
  - Reconstructed the images with acceptable perceptual quality at a low bitrate (like 0.03bpp), which is a hard case for other popular image codecs
  - A first-author paper accepted to IEEE VCIP 2019 as an **oral presentation**

Compressive Sampling for Array Cameras

- Camputer Lab, Duke Kunshan University   Jun 2018 – Aug 2018
- Supervisor: Prof. David J.Brady
  - Selected a Compressed-Sensing method to reduce computation in the encoder and processed raw bayer format data from camera
  - Achieved better results than JPEG/JPEG2000: maintaining high quantitative profile like 35dB in PSNR with compression ratio around 1/200
  - Designed an integer kernel strategy for training and reduced the power consumption largely about 10-100 times
  - A co-author paper submitted to SIAM Journal on Imaging Sciences

Neural Stitching

- C.I.T.E Lab, Nanjing University   Oct 2018 – Dec 2018
- Supervisors: Prof. Xun Cao and Prof. Yue Tao
  - Used a low resolution image as guidance and registered high resolution images to the low-res image
  - Combined plane sweep volume(PSV) method with CNN and accomplished the de-parallax task while maintaining resoultion

Optical Flow Compensation for Multi-Frames Super-Resolution

- Vision Lab, Nanjing University   Feb 2018 – May 2018
- Supervisor: Prof. Zhan Ma
  - Stacked multiple deep convolutional neural networks to deal with different kinds of displacements
  - Proposed a U-net shape CNN to estimate the optical flow between two or more neighboring frames
  - Employed a image warping in the neighboring two frames to estimate the current frame and achieved multi-frames super resolution

OTHER WORK EXPERIENCE

Virtual Reality and Imaging Research Centre, the Chinese University of Hong Kong

- Research Assistant,   Jul 2019 – Present

- Explored in high-level 3D vision especially point cloud understanding for better shape generation and editing
- Developed novel deep neural network based algorithms for 3D point cloud processing like point cloud upsampling and denoising

Aqueti(China) Technology Inc., Co., Suzhou, Jiangsu, China

- Assistant Research and Develop Engineer,   Jun 2018 – Aug 2018
    - Established a multi-view camera system and collected image data from different objects and scenes to make training dataset
    - Developed novel convolutional neural network based algorithms for array cameras data processing pipeline

YANSHENG TECHNOLOGY CO., LTD., Guangzhou, Guangdong, China

- Assistant Researcher,   Jul 2017 – Aug 2017
    - Improved the storage algorithm and program structure, provided a powerful data analysis function in order to improve the Fujian traffic system's efficiency
    - Participated in web page design and helped establish a user friendly interface with quick response and concise style operation

PUBLICATIONS

JOURNALS

[1] X. Yan, D. Brady, J. Wang and **C. Huang** "Compressive Sampling for Array Cameras,"
Submitted to SIAM Journal on Imaging Sciences, Aug 2019.

CONFERENCES

[1] **C. Huang***, R. Li*, and C. Fu "Non-local Attention-based Progressive 3D Point Cloud Denoising,"
*submitted to **CVPR 2020***, Nov 2019.(* joint 1st authors)

[2] **C. Huang**, H. Liu, and Z. Ma "Extreme Image Compression via Multiscale Autoencoders with Generative Adversarial Optimization,"
*Accepted to IEEE VCIP 2019 as an **oral presentation***, Aug 2019.

PATENT

Compressed sampling in array cameras

- Status: In application for US Patent   Nov 2018

CAMPUS ACTIVITIES

Xianyu Sign Language Club, Nanjing University

- Vice President   Aug 2016 – Jun 2017
    - Organized and held public benefit activities about sign language for students in Nanjing University

Academic Department, Nanjing University

- Vice President   Aug 2016 – Jun 2017
    - Organized and held a series of academic exchange activities such as professional lecture and experience sharing

AWARDS & SCHOLARSHIPS

- Yang Yongman Scholarship, Nanjing University   Jan 2018
- Second-Class People's Scholarship, Nanjing University   Dec 2017
- Special-Class People's Scholarship, Nanjing University   Dec 2016

LANGUAGES

- English: Fluent (speaking, listening, reading, writing)
    - TOEFL: Total 101(Reading30+Listening26+Speaking20+Writing25)
    - GRE: Verbal 153, Quantitative 169, Analytical Writing 3.0
- Cantonese: Fluent (reading, listening, speaking); Intermediate (writing).

PROGRAMMING SKILLS

- Language: MATLAB,C/C++,Python
- Frameworks: Pytorch, Tensorflow.

RESEARCH INTERESTS

Computer Vision, Computer Graphics, Deep Learning, Image and Video Processing.