

# Zhihang Ren

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<https://albuspeter.github.io/>

## Education

- *Master of Science in Electrical and Computer Engineering* Expected Jun. 2019  
University of California, San Diego
- *Bachelor of Engineering in Electronic and Electrical Engineering* Jun. 2017  
University of Glasgow
- *Bachelor of Science in Electronic Engineering* Jun. 2017  
University of Electronic Science and Technology of China

Undergraduate Overall GPA: 3.90/4.0 Graduate Overall GPA: 3.746/4.0  
Core courses: Digital Image Processing, Random Process, Convex Optimization, Statistical Learning, Neural Networks/Pattern Recognition, Deep Learning and Applications, Computer Vision, Sensing & Estimation in Robotics, Planning & Learning in Robotics

## Scholarships & Awards

National Scholarship (top 1.5%) in two consecutive years (2013-2014, 2014-2015) awarded by the Chinese Department of Education  
People's First Prize Scholarship (top 5%) in 2015-2016 semester awarded by the Chinese Department of Education  
Academic Excellent Scholarship (top 5%) in two consecutive years (2013-2014, 2014-2015) awarded by the Glasgow College, UESTC

## Research Experience

*Deep Learning, Medical Imaging* Dec. 2018 – Present

### DNN for SPECT imaging

- Try to accelerate the reconstruction of the SPECT image by using DNN
- Aim to utilize total variation prior for the reconstruction of high resolution image

*Deep Learning, Computer Vision*

Feb. 2018 – Present

### Bias in Action Recognition

- Studied representation biases on state-of-the-art action recognition datasets.
- Established relationship between typical algorithms and different representations

*Image and Video Processing*

May. 2017 – Aug. 2017

### Coding Trajectory: Enable Video Coding for Video Denoising

- Implemented an efficient and robust video denoising method.
- Enable video coding information for video denoising.
- Proposed a novel strategy for weighting noisy image patches.

*Image and Video Processing*

Dec. 2016 – May. 2017

### MeshFlow Video Denoising

- Implemented an efficient and robust video denoising method.
- Utilized mesh-flow for motion estimation.
- Proposed a novel method for fast dense motion field estimation.

*Image and Video Processing*

Oct. 2015 – Jul. 2016

### Shape Recovery of Endoscopic Videos by Shape from Shading(SfS) using Mesh Regularization

- Presented a method to recover the inner-surface's shape of organs from endoscopic videos.
- Employed SfS for estimating a first 3D representation.
- Used a mesh least-squares regularization for constrain.

- Employed a spatial-temporal approach for smoothing of consecutive frames.

*Theoretical Physics & Physical Experiments*

*Sep. 2014 – Jan. 2015*

**Signal Analysis of Sound Produced by Collision of Steel Balls**

- Quantified the frequent modulation characteristic.
- Explained the source of the chirping.
- Matched with the practical case both in the wave form and the sound effect.

**Publication**

- **Zhihang Ren**, Peng Dai, Shuaicheng Liu, Shuyuan Zhu, Bing Zeng, "Coding Trajectory: Enable Video Coding for Video Denoising", on IEEE ICIP 2018.
- **Zhihang Ren**, Jiajia Li, Shuaicheng Liu, Bing Zeng, "MeshFlow Video Denoising", on IEEE ICIP 2017.
- **Zhihang Ren**, Tong He, Lingbing Peng, Shuaicheng Liu, Shuyuan Zhu, Bing Zeng, "Shape Recovery of Endoscopic Videos by Shape from Shading using Mesh Regularization", on ICIG 2017.
- Lei Wang, Hao Wu, Jikun Jin, **Zhihang Ren**, Hongrui Zhang, Baohua Teng, "Signal analysis of sound produced by collision of steel balls", in Physics Experimentation Vol.35 No.12, 1-4, Dec. 2015.

**Teaching Experience**

*Statistical Learning*

*Sep. 2018 – Dec. 2018*

**Teaching Assistant**

Work for Prof. Nuno Vasconcelos as TA in the Statistical Learning course, holding office hours and addressing common questions. The course has 290 students in total.

*Microelectronic Systems*

*Mar. 2017 – Jun. 2017*

**Teaching Assistant**

Work for Prof. Wasim Ahmad and Prof. Sajjad Hussain as TA in the Microelectronic Systems course, addressing common questions in the lectures and helping students in their lab sessions.

*Introductory Programming*

*Sep. 2015 – Dec. 2016*

**Teaching Assistant**

Work for Prof. Wasim Ahmad as his TA in the Introductory Programming course, addressing common questions in the lectures and helping students in their lab sessions.

**Talks**

- "Introduction to Deep Learning" Feb. 20, 2019  
Machine Learning Study Group, DSP Lab, UCSD
- "Deep Generative Models" May. 9, 2019  
Machine Learning Study Group, DSP Lab, UCSD
- "Deep Neural Networks" May. 3, 2019  
Machine Learning Study Group, Jacobs Medical Center, UCSD
- "Introduction to CNNs" May. 31, 2019  
Machine Learning Study Group, Jacobs Medical Center, UCSD

**Skills**

*Programming Languages & Libraries* : C/C++, Python, L<sup>A</sup>T<sub>E</sub>X, OpenCV, OpenGL  
*Softwares* : Visual Studio, MATLAB, PhotoShop, Premiere, Illustrator  
*Deep Learning Framework* : Pytorch, TensorFlow, Keras

**Hobbies**

Exercise, Photography, Traveling