

# Wenzheng Chen

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**EDUCATION**     *2017-present*, Ph.D. candidate of Computer Science, University of Toronto.  
Supervised by Prof. [Sanja Fidler](#) and Prof. [Kyros Kutulakos](#).

2014-2017, Master of Computer Science, Shandong University.  
Supervised by Prof. [Changhe Tu](#).

*2010-2014*, Bachelor of Computer Science, Taishan College, Shandong University.

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**SHORT**            I am a PhD student at University of Toronto. I also interned at Algolux, NVIDIA and Snapchat. Generally, my research focuses on computational photography and 3D vision. More specifically, I work on 3D reconstruction, both in traditional geometric way and via deep learning. I am also interested in adding physical constraints in neural network.

**BIO**

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**SELECTED**        **Wenzheng Chen\***, Fangyin Wei\*, Kyros Kutulakos, Szymon Rusinkiewicz, Felix Heide. Learned Feature Embeddings for Non-Line-of-Sight Imaging and Recognition. SIGGRAPH Asia, 2020.

**PUBLICATION**

**Wenzheng Chen\***, Parsa Mirdehghan\*, Sanja Fidler, Kyros Kutulakos. Auto-Tuning Structured Light by Optical Stochastic Gradient Descent. CVPR, 2020.

**Wenzheng Chen**, Jun Gao\*, Huan Ling\*, Edward J. Smith\*, Jaakko Lehtinen, Alec Jacobson, Sanja Fidler. Learning to Predict 3D Objects with an Interpolation-based Differentiable Renderer. NeurIPS, 2019.

**Wenzheng Chen**, Simon Daneau, Fahim Mannan, Felix Heide. Steady-state Non-Line-of-Sight Imaging. CVPR, 2019, Oral.

Parsa Mirdehghan, **Wenzheng Chen**, Kyros Kutulakos. Optimal Structured Light a La Carte. CVPR, 2018, Spotlight.

**Wenzheng Chen**, Huan Wang, Yangyan Li, Hao Su, Zhenhua Wang, Changhe Tu, Dani Lischinski, Daniel Cohen-Or, Baoquan Chen. Synthesizing Training Images for Boosting Human 3D Pose Estimation. 3D Vision, 2016, Oral.

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**RECENT**            *2017.9-present*, Optimal Structured Light

**RESEARCH**        In this project, we aim to discover optimal structured light patterns to recover scene geometry. Previously, people manually design patterns in heuristic ways. Instead, we define a differentiable linear imaging formation model, insert it in neural network and automatically optimize patterns via gradient descent. Further more, we extend

the synthetic linear formation model to arbitrary real devices with distinct characteristics. We propose auto-tuning, a new hardware-in-the-loop technique which is able to put the devices in neural network optimization and allows them automatically discover their own optimal coding and decoding schema. Part of this work have been accepted by CVPR 2018 and CVPR 2020.

*2018.10-present*, Differentiable Render

In this project, we propose DIB-R, a complete differentiable rendering framework which allows gradients to be analytically computed for all pixels to all 3D vertex attributes. Key to our approach is to view foreground rasterization as a weighted interpolation of local properties and background rasterization as an distance-based aggregation of global geometry. Our approach allows for accurate optimization over vertex positions, colors, normals, light directions and texture coordinates through a variety of lighting models. We demonstrate that it is possible to infer 3D shape, texture and light from a single image via 2D supervision only. Part of this work have been accepted by NeurIPS 2019.

*2018.7-present*, None-line-of-sight Imaging

In this project, we aim to reconstruct static occluded objects from indirect reflections. Previous work are always based on temporal information. We first demonstrate that it is sufficient to reconstruct objects using conventional cameras. Further more, we propose to learn feature embeddings for NLOS imaging and recognition by propagating features through physical modules, results in less memory usage, faster running time and achieving the state-of-the-art results. Part of this work have been accepted to CVPR 2019 and SIGGRAPH Asia 2020.

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## AWARDS

*2017*, University of Toronto Fellowship  
*2014*, First Prize of Excellent Student Scholarship in Shandong University  
*2014*, First Prize of China Undergraduate Mathematical Contest in Modeling, Shandong Division  
*2012*, Honorable Mention of MCM(Mathematical Contest In Modeling)

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## SKILLS

Experienced in C/C++ and Matlab, especially in calling C++ in Matlab  
Experienced in OpenCV and OpenGL, especially in image processing  
Experienced in TensorFlow, PyTorch, MatConvNet and Caffe  
Long time working in Linux system, from Ubuntu 11 to 18

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## WEBPAGES

*Personal website, Google scholar, DBLP, LinkedIn*