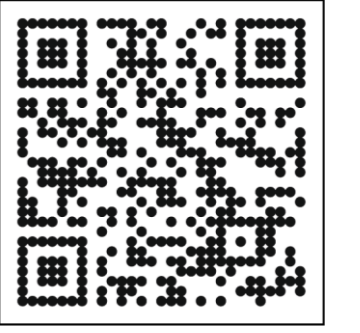


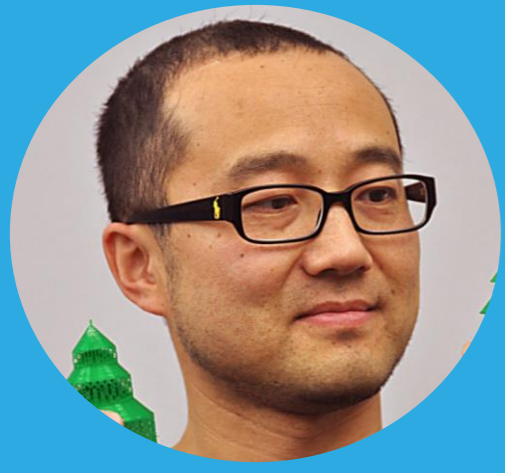


北京大学前沿计算研究中心
Center on Frontiers of Computing Studies, Peking University

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Finding the Right Representations for Generative Modeling of 3D Shapes



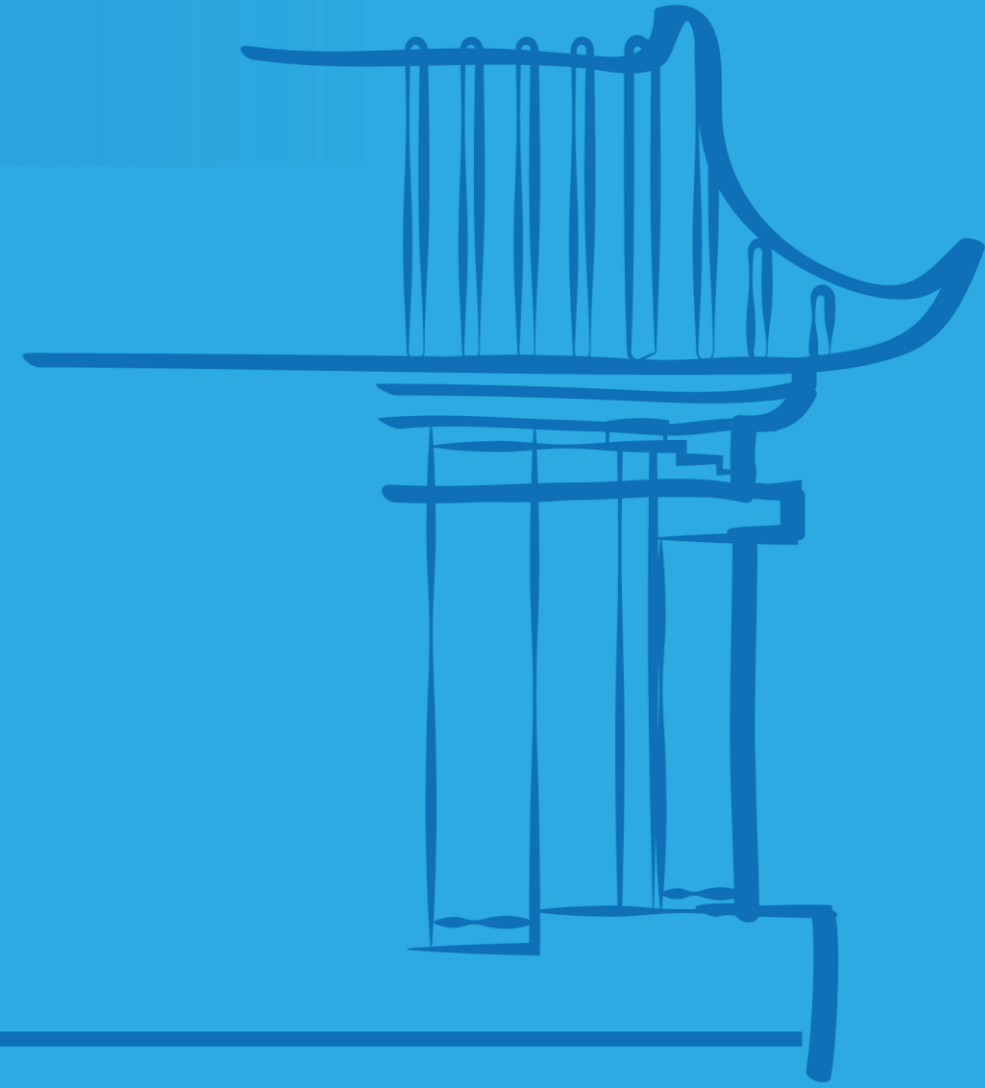
Prof. Hao (Richard) Zhang 张皓

School of Computing Science
Simon Fraser University

🎤 Host: 陈宝权 教授

🕒 2019年4月24日 星期三 17:00-18:00

📍 北京大学静园五院107



Abstract

Unlike images and video, 3D shapes are not confined to one standard representation. This is one of the challenges we face when developing deep neural networks (DNNs) to learn generative models of 3D shapes or virtual scenes. Up to now, voxel grids, multi-view images, point clouds, and integrated surface patches have all been considered. In this talk, I show that traditional convolutional neural networks (CNNs) operating on pixels/voxels may not be best suited for the task. I present our recent works on using implicit shape representations and a generative autoencoder for shape structures to improve the quality of shape generation using DNNs. The latter approach decouples coarse and fine-grained learning of structured data, which is applicable to both 3D shapes, indoor scenes, and digital documents.

Biography

Hao (Richard) Zhang is a full professor in the School of Computing Science at Simon Fraser University (SFU), Canada, where he directs the graphics (GrUVi) lab and is currently the Associate Director of Research and Industrial Relations, as well as the inaugural director of the Professional Masters Program in Visual Computing. He also holds or has held visiting professor positions at Stanford University, Shenzhen University, and Beijing Film Academy. Richard obtained his Ph.D. from the Dynamic Graphics Project (DGP), University of Toronto, and M.Math. and B.Math degrees from the University of Waterloo, all in computer science. His research is in computer graphics with special interests in geometric modeling, analysis and synthesis of 3D contents (e.g., shapes and indoor scenes), machine learning (e.g., generative models for 3D shapes), as well as computational design, fabrication, and creativity. He has published more than 120 articles on these topics, including 50 papers from SIGGRAPH (+Asia) and ACM Trans. on Graphics, the top venue in the field. Richard served as editor-in-chief for Computer Graphics Forum (2014-2018) and an associate editor of several journals including IEEE Trans. on Visualization and Computer Graphics, IEEE Computer Graphics & Applications, among others. He has served on the program committees of all major computer graphics conferences including SIGGRAPH (+Asia), Eurographics, Symposium on Geometry Processing (SGP), and is SIGGRAPH Asia 2014 course chair, a paper co-chair for SGP 2013, Graphics Interface 2015, and CGI 2018, and a program co-chair for the International Geometry Summit 2019 and SIAM GD 2019. Richard is an IEEE Senior Member and his awards an NSERC DAS (Discovery Accelerator Supplement) Award in 2014, Best Paper Awards from SGP 2008 and CAD/Graphics 2017, a Faculty of Applied Sciences Research Excellence Award at SFU in 2014, and a National Science Foundation of China (NSFC) Overseas Outstanding Young Researcher Award in 2015. For his university service, he received the SFU Dean of Graduate Studies Awards for Excellence in Leadership in 2016.

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