

KEYNOTE TALK

Wednesday, October 5, 2022 at 9:00am

3D Reconstruction: Leveraging Synthetic Data for Lightweight Reconstruction

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Abstract: Reconstruction and regression tasks are central problems in computer vision. We consider, for example, using a single image to recover the 3D structure of an indoor or outdoor scene, or of a human face or body, or recovering the reflectance properties of surfaces or the lighting in a scene. However, in such tasks it is challenging to obtain large amounts of accurately labeled real training data; it's easy to label an image by saying: "this is a picture of a dog", but much harder to label the shape of an object or its reflectance properties, or the lighting in a scene. In many cases, computer graphics provides access to large quantities of labeled data, but there is a domain gap between real images and images generated by graphics. I'll discuss a series of works that address the challenge of using labeled synthetic data to infer properties of the world from real images. I'll discuss methods that are lightweight, in the sense of requiring only a single image or a few easily acquired images.



Speaker Bio-Sketch: Dr. David W. Jacobs is a professor in the Department of Computer Science at the University of Maryland with a joint appointment in the University's Institute for Advanced Computer Studies (UMIACS). He is currently on leave as an AI Research Scientist at Meta. He received a PhD from MIT and then conducted research at the NEC Research Institute, until he joined the CS department at the University of Maryland. Dr. Jacobs has worked in many areas of computer vision and machine learning. He has served as an Associate Editor of IEEE PAMI, an Area Editor for Computer Vision and Image Understanding, and as Program co-Chair for CVPR. He and his co-authors received honorable mention for the best paper award at CVPR 2000. He also co-authored a paper that received the best student paper award at UIST 2003, and

he and his co-authors received the best paper award in Eurographics 2016. Dr. Jacobs and his collaborators have been awarded the 2011 Edward O. Wilson Biodiversity Technology Pioneer Award for the development of Leafsnap, an app for tree species identification that has been downloaded over 1.5 million times and widely used in education and biodiversity studies.