

The visual data we see in the form of images and videos on the Internet has exploded over the last decade. We are currently seeing a new form of data emerge: big 3D data. Websites such as 3D Warehouse and TurboSquid contain hundreds of thousands of 3D models for a variety of objects such as vehicles, architecture, furniture, electronics, toys, characters, animals, and household items. These 3D repositories provide unique opportunities for novel research in applications such as photo-manipulation, robotic interactions, and augmented reality. In my talk, I will discuss my prior research on leveraging 3D models to provide 'manipulated' reality, i.e., full range 3D interactions with objects in images of real-world scenes. By using 3D models to understand the geometry, illumination, and 3D appearance of a scene, this research has re-imagined traditional photo-editing operations such as rotations, translations, deformations, and copy-paste as manipulations in 3D. I will also discuss current research at our studio on using large quantities of image and video data captured by ubiquitous camera systems to augment 3D model repositories with more informative object representations for intuitive manipulated reality.