3D Reconstruction of Reflective Surfaces

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Online video: `https://youtu.be/9Y201Ve0PqI`

3D reconstruction of reflective surfaces remains a challenging problem, as well as its applications for augmented reality. This dissertation attempts to design and implement a solution to reconstruct such surfaces in any environment, and use the results for animation. The environment is used as a prior to reconstruct both planar and curved mirrors. The surface of the mirror is deduced from correspondences between points and their reflection. The correspondences allow to find a symmetry plane, or to triangulate points of the specular surface. Eventually, the results are used and demonstrated in an animation, where a computer made object and its reflection are inserted in the scene. This could be a first step toward augmented reality in a scene with mirrors.