

## **Thesis:** 6D Rigid Objects Pose Estimation in Deep Learning

**Abstract:** 6D pose estimation is a crucial and fundamental task for many application fields, including augmented reality and robotic manipulation. The 6D object pose transforms the 3D object from the object coordinate into the camera coordinate, and 6D refers to the posture of an object, i.e., 3D position and 3D orientation. Due to its significance in the industry and academia, 6D pose estimation has been well-studied for several years, and numerous methods have been invented. With the development of deep learning networks, many approaches have brought breakthroughs in 6D pose estimation.

To understand how the deep learning networks beneficially impact 6D pose estimation, this survey will introduce the learning-based approaches to 6D pose estimation. The survey is divided into two main categories: correspondence-based methods and direct estimation approaches. Within each main category, based on how is a 6D pose generated, each primary category has two sub-categories: non-voting and voting methods. Furthermore, each sub-category will be divided into 2D-based and 3D-based methods according to the input data type. In addition to the methodology, the survey will discuss the challenges of 6D pose estimation, introduce common experimental datasets and compare the performances of various methods quantitatively.

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