

**Abstract:**

Accurate robot-world, hand-eye calibration is crucial to automation tasks. In this paper, we discuss the robot-world, hand-eye calibration problem which has been modeled as the linear relationship  $AX = ZB$ , where  $X$  and  $Z$  are the unknown calibration matrices composed of rotation and translation components. While there are many different approaches to determining  $X$  and  $Z$ , including linear and iterative methods, we parameterize the rotation components using Euler angles and find a solution using Levenberg-Marquadt iterative approach. We also offer a method to determine  $A$ ,  $X$ , and  $Z$ , by formulating the robot-world, hand-eye calibration problem in terms of camera reprojection error. We compare both of these approaches to the state-of-the-art and conclude that our approaches yield lower values of camera reprojection error. In addition, we demonstrate the improved reconstruction accuracy when using the robot-world, hand-eye calibrations produced from our methods.