**Task execution.**

The relative posture between the needle driver and the needle may change during task execution. This situation happen frequently during needle regrasping procedure, in which the needle may not in its original place during demonstration. To keep the learned needle trajectory and perform fabric piercing precisely, the robot end-effector trajectory needs to be modified in order to adapt to the new needle posture, so each time before performing fabric piercing, needle pose estimation is performed using the stereo vision system and the relative transformation between the ideal needle posture and actual needle posture is calculated. Using the hand-eye calibration matrix, a new robot end-effector trajectory can be achieved.