Team E SVD Testing	
Objective	Test 1. To demonstrate single-arm real hardware integration Test 2. To demonstrate dual-arm autonomous operation in simulation
Elements	Perception, Planning, Navigation, and Extraction Subsystems
Location	FOAM Robotics Lab - Wean Hall 1317
Equipment	Gripper Arm Assembly (xArm 7, Gripper End Effector, Gripper Palm Camera), MRSD PC
Personnel	Abhishek, Tom, Rohit, Keerthi, Kshitij
Procedure	**Test 1: Single-Arm gripping of pepper in real-world setup** **Setup:** ● Place the pepper on the adjustable hanging mount with a predefined orientation. ● Attach a mount in an extended branch of an artificial plant such that pepper is fully visible. ● Mount the xArm7 with control box and ethernet setup and initialize the system. ● Place the artificial plant in the workspace of xArm7. **Demonstration (repeat 4 times):** ● The robot should perceive, plan, and grip the pepper on the artificial plant. ● A team member manually cuts the peduncle and signals the program. ● The system places the harvested pepper in front of the workspace and resets. ● Repeat this procedure for varying orientations of the pepper. **Test 2: Dual-Arm harvesting of pepper in simulation** **Setup:** ● Launch bimanual simulation in Gazebo + RViz on the MRSD PC. ● Initialize relevant nodes and subsystems with no target pepper in the simulation. **Demonstration (repeat 5 times):** ● Generate multiple reachable, fully-visible green peppers within the robot workspace. ● The robot should plan the tasks of harvesting each simulated pepper autonomously. ● The robot should plan, and harvest each simulated pepper and store it. ● After harvesting all peppers, the robot should return its arms to the home position.
Verification Criteria	**Test 1:** ● For SVD, at least one out of four attempts should be successful (≥ 25% success rate). ● Verify that the peppers are detected correctly with a relatively accurate pose estimate. ● Verify that the arm trajectories are planned and executed without collision. ● Verify that the peppers were gripped successfully by the gripper and do not fall. **Test 2:** ● For SVD, at least two out of five attempts should be successful (≥ 40% success rate). ● Verify that peppers in the scene are prioritized based on proximity to the robot. ● Verify that arm trajectories are planned and executed without collision. ● Verify that the simulated peppers were gripped, cut, and stored successfully.