Umesh Sai Teja Poola - Contributions

Goal:
Set up a fully functional **ROS 1 workspace (ros1_ws)** integrated with **MoveIt** for the **UR10e + Robotiq 2F-85 gripper**. The objective was to visualize and execute joint-space trajectories in **RViz** for motion planning and testing.

Key Tasks:
Built complete ROS 1 workspace structure (ros1_ws/src) with custom packages: pick_place_bringup, pick_place_core, board_mapping and robotiq_control.
Configured **MoveIt** for UR10e: created SRDF files, defined planning groups, and fine-tuned joint limits and controller manager parameters.
Set up **ros1_control** and joint_trajectory_controller to simulate robot motion and verify hardware interface consistency.
Developed and tested bringup.launch.py to spawn UR10e, gripper, chessboard, and sample cube in **RViz**.
Verified **motion planning** and successful **Plan & Execute** cycles using MoveIt in RViz.
Maintained and expanded the **README** file with full workspace setup, dependency installation, and launch instructions for team reproducibility.

Deliverables:
Stable ROS workspace with MoveIt integration.
Functional launch system (bringup.launch.py) for visualization and motion planning.
Updated **README.md** providing setup and execution guidelines.
Environment validated for future **Pick-and-Place automation** and **YOLO vision pipeline integration**.

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Results:

UR10e + Robotiq system successfully spawned and controlled in RViz .
MoveIt planning and execution validated through multiple trajectory tests.
Achieved seamless control integration between MoveIt planners and ros_control interfaces.
Ensured maintainability and reproducibility through clean workspace structure and documentation.

Code Metrics:

Total lines of code contributed: **6,000+**

This includes workspace setup, MoveIt configuration, controller integration, testing scripts, and documentation updates.

Impact:

Delivered a **production-ready ROS + MoveIt foundation** for the entire Senior Design project.
Greatly accelerated future motion-planning and vision-integration tasks.
Positioned the team for successful **Pick-and-Place** and **YOLO-based chess automation** in upcoming demos.

Git lab Commit History:

https://git.las.iastate.edu/SeniorDesignComS/2025fall/402c/sd07_joseph_hoane_1/-/commits/main?author=Umesh%20Sai%20Teja%20Poola