Mobipick Labs System Demonstration

ABSTRACT

In this demonstration we show the *Mobipick Labs* environment, which is a testbed for planning, execution and monitoring algorithms in a robotic domain. It provides a physics-based simulation environment for a mobile robot together with full integration of the robot and easy-to-use interface for the robot's capabilities. This gives users without a strong robotics background the opportunity to apply their planning related work to a robotic domain.

FUNCTIONALITY

- Multiple environments available with random object placement.
- Autonomous navigation, perception: 6D Object pose estimation and classification, Pick/Place/Insert manipulation using ROS Moveit.
- A pre- and concise Python API to control robots with simple commands.
- Simple semantic and numeric environment representation.
  - Provides real-time knowledge in the form of "facts" that can be used to monitor the execution status.
- Multiple examples of how objects can be transported between locations using task planning. (i.e., Unified Planning, ROSPlan).

HIGHLIGHTS

- Easy to install and to use.
- The physics-based simulation is close to the real robot.
- Simulated camera has partial observability.

PUBLICATIONS

Lima, O.; Günther, M.; Sung, A.; Stock, S.; Vinci, M.; Smith, A.; Krause, J. C.; and Hertzberg, J. 2023. A Physics-Based Simulated Robotics Testbed for Planning and Acting Research. In ICAPS Workshop on Planning and Robotics (PlanRob 2023).

Some pre-recorded named arm configurations.
home, observe100cm_right, transport, handover

Mobipick Labs: A realistic robotic simulation for planning and acting research.

Simulation.
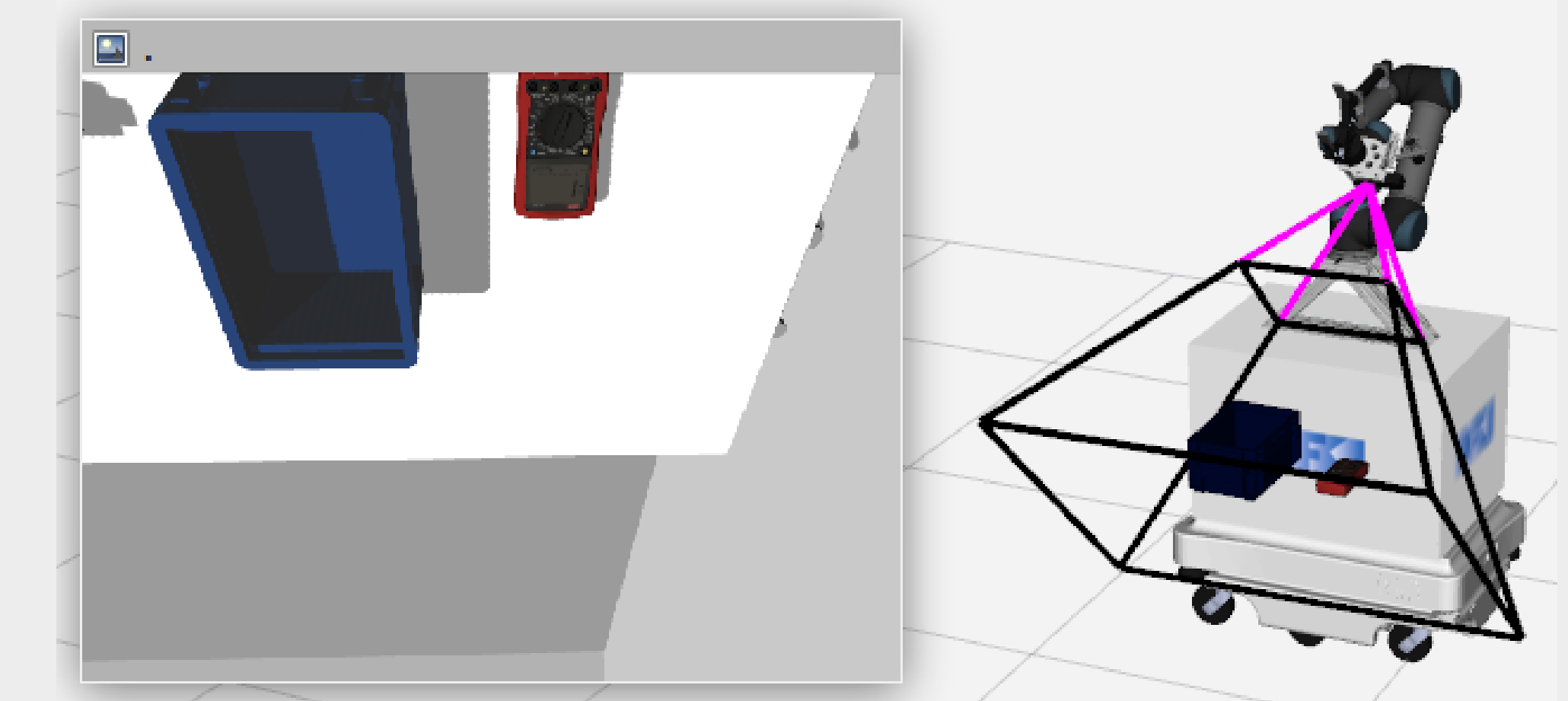

Real robot.

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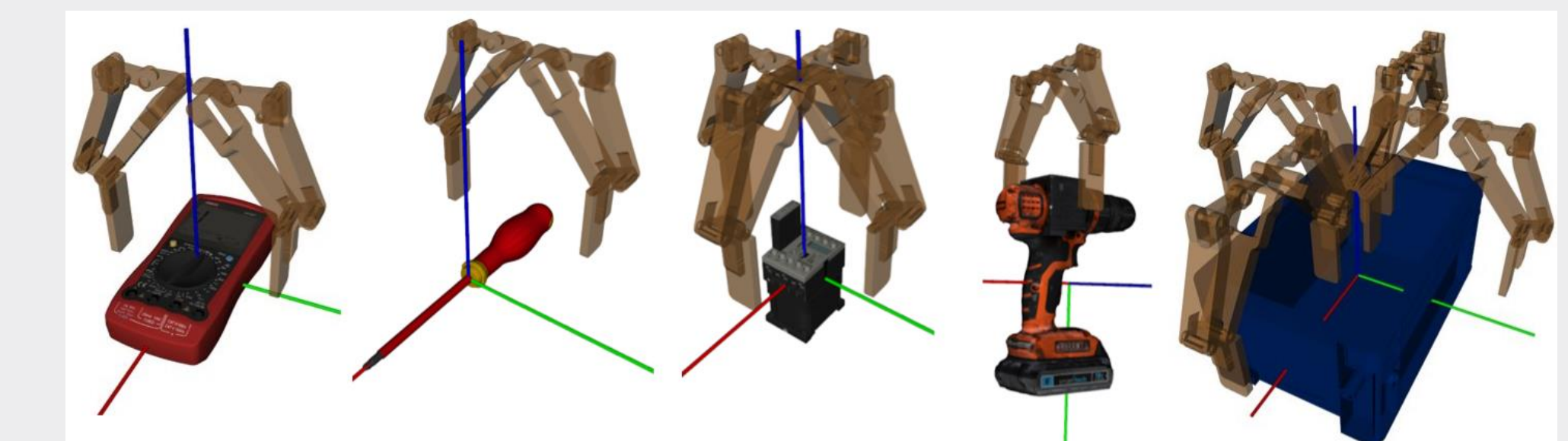
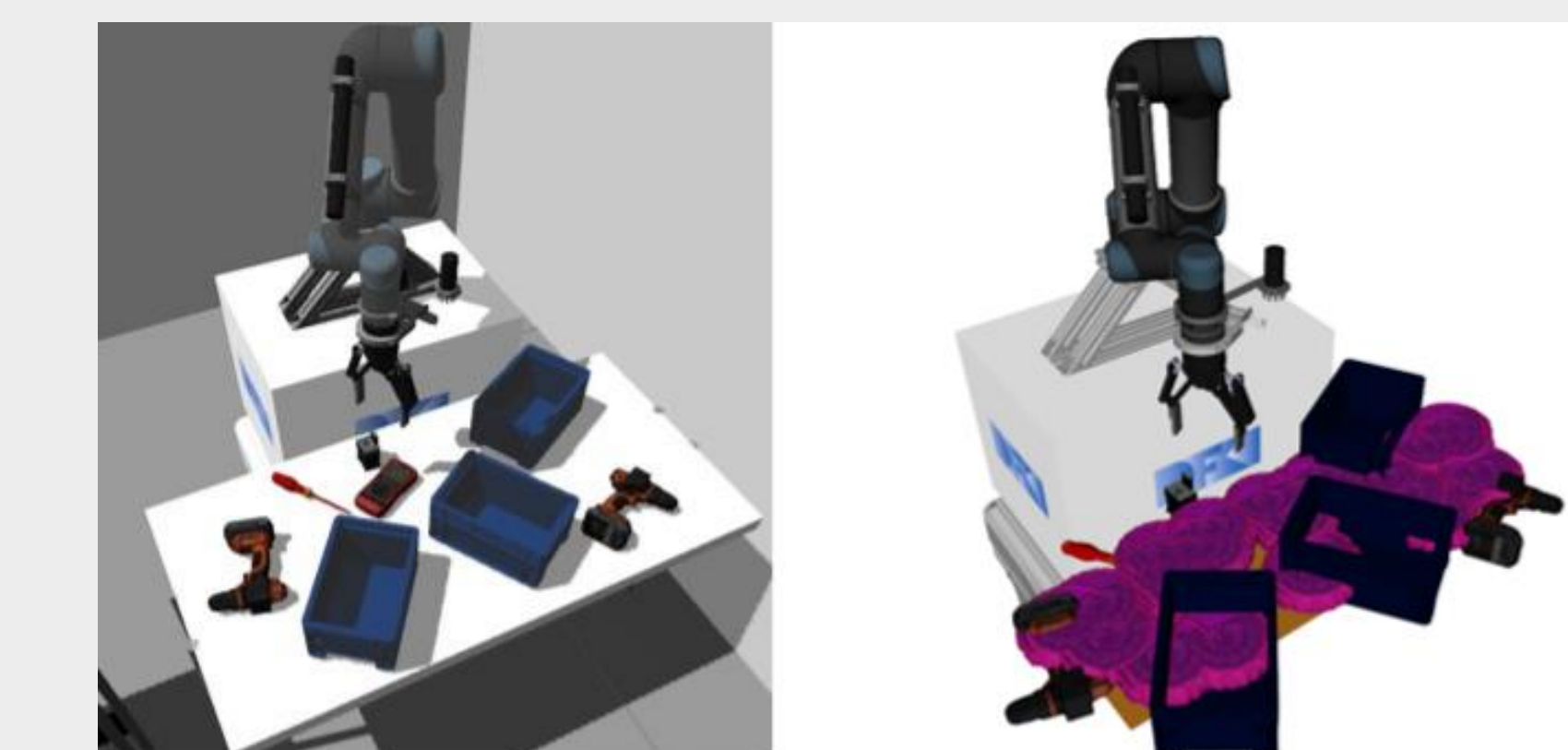### PLAN-BASED ROBOT CONTROL

Available objects. (New objects can be added using photogrammetry)
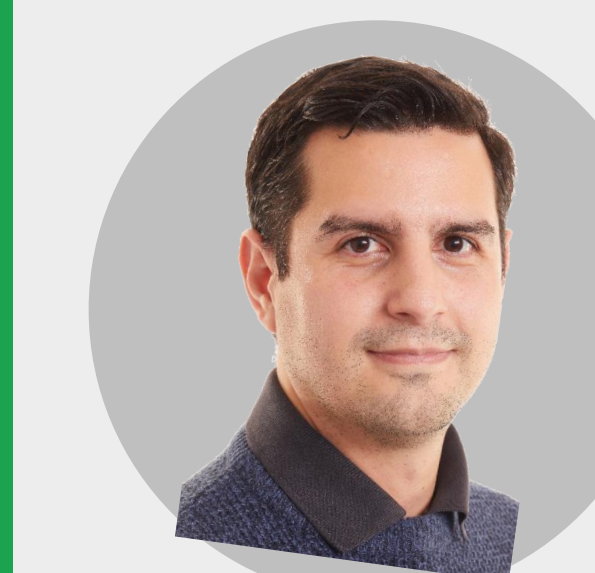

Object recognition and pose estimation.
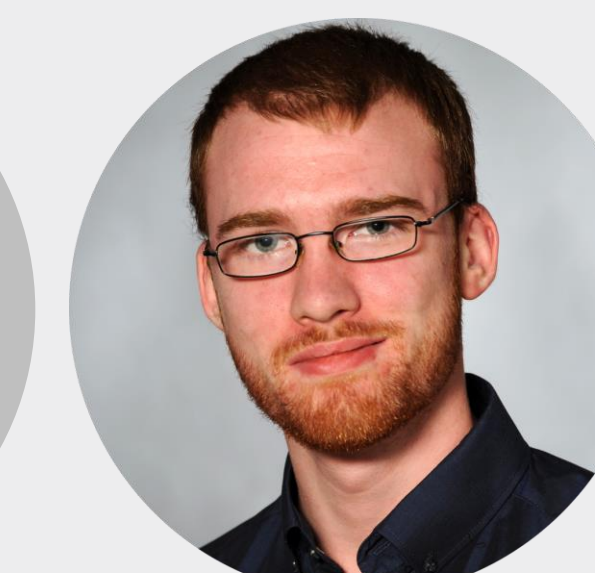

Predefined grasp configurations.

Manipulation: Pick / Place / Insert

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