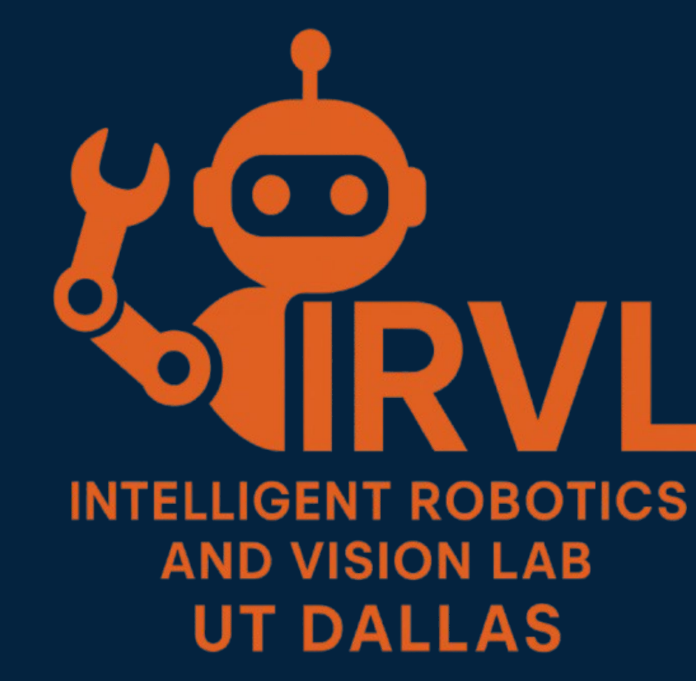


HRT 1

One-Shot Human-to-Robot Trajectory Transfer for Mobile Manipulation



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Motivation

● Most work focuses on manipulation assuming the robot is already positioned.

● But in the real world, robots must solve where to stand and how to act.

Key Question

Can a robot do

- Mobile Manipulation
- From one human video
- Without any training

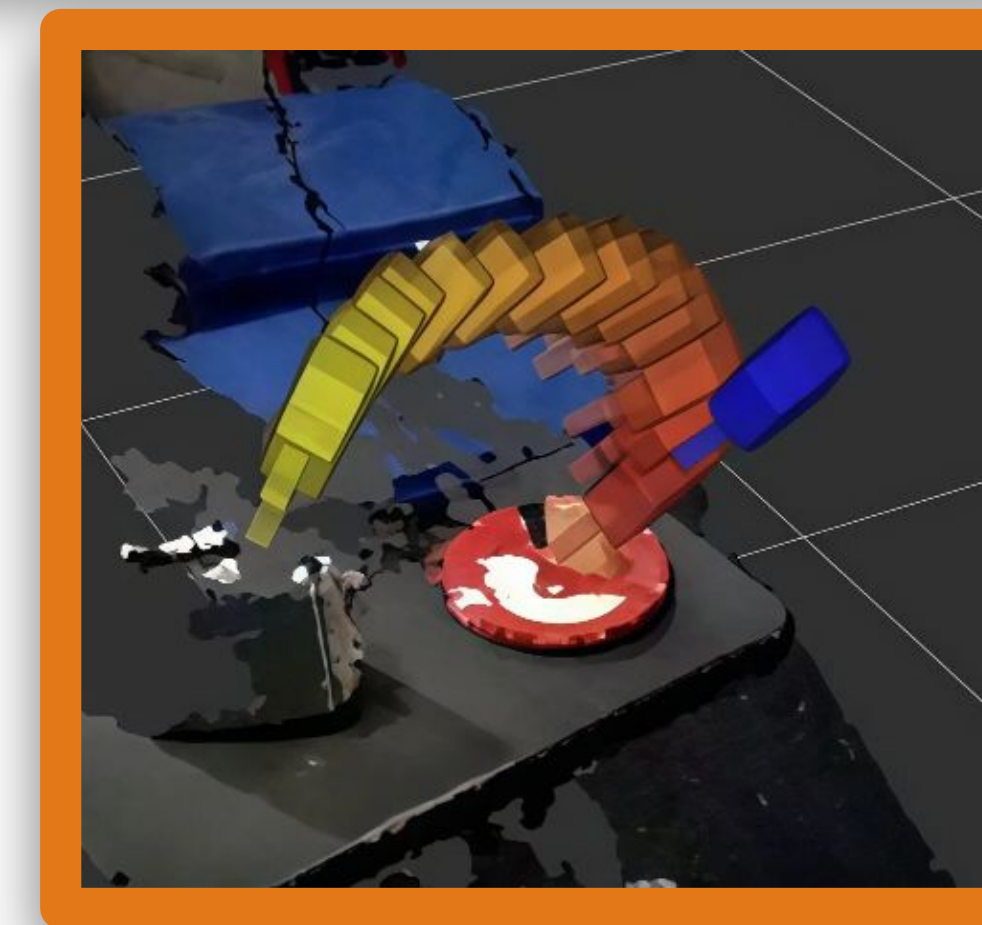
Core Idea

Human Demo



- ★ One Human
- ★ Any mobile manipulator
- 🕶 MR Device
- 📷 RGB-D Video

Video Understanding



- ✓ HaMeR: Hand Pose
- ✓ UGCS: Hand Pose -> Gripper Pose
- ✓ Represent Gripper in Object Frame
- ✓ BundleSDF: 6D Object Pose Tracking

Robot Execution

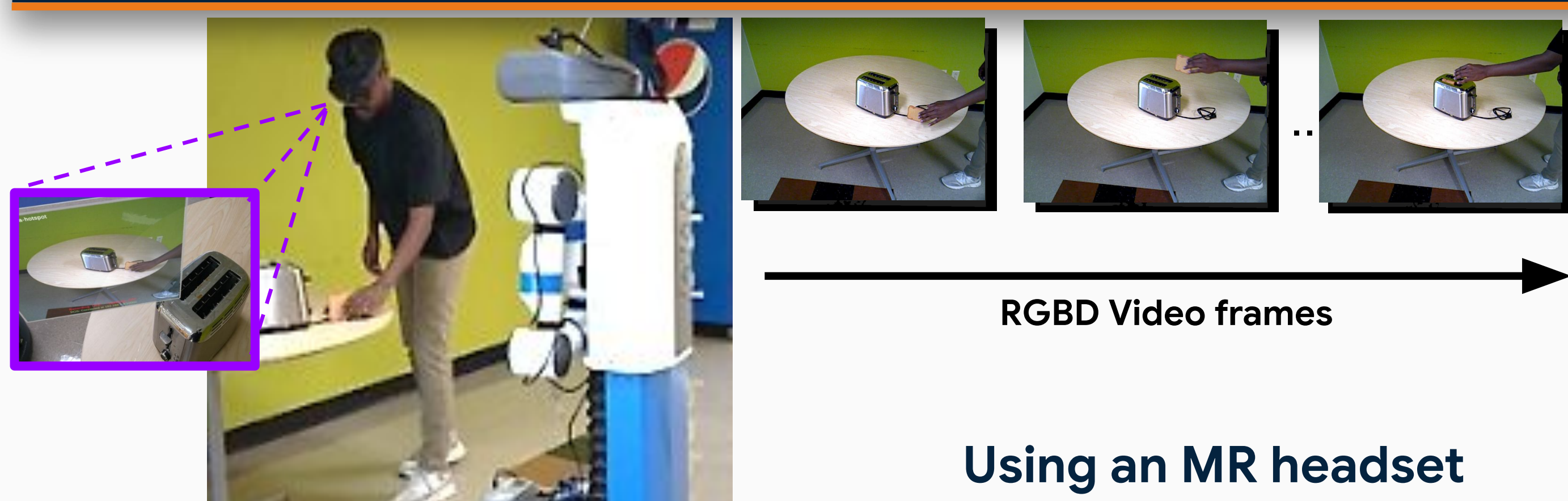


- ⚙ Feasible Base Position
- ⚙ Track the Trajectory
- 🎯 Cross Embodiment
- 🎯 Different Environments

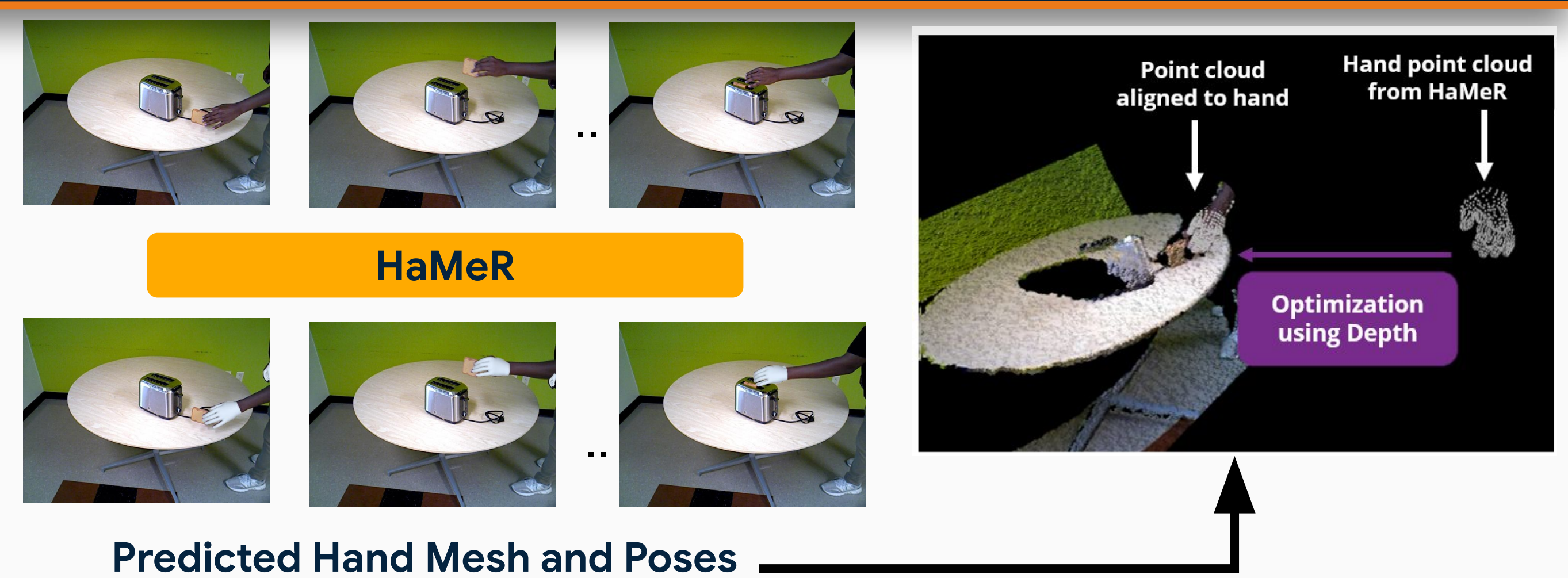
System Pipeline

Solves both **WHERE** (base) and **HOW** (arm)

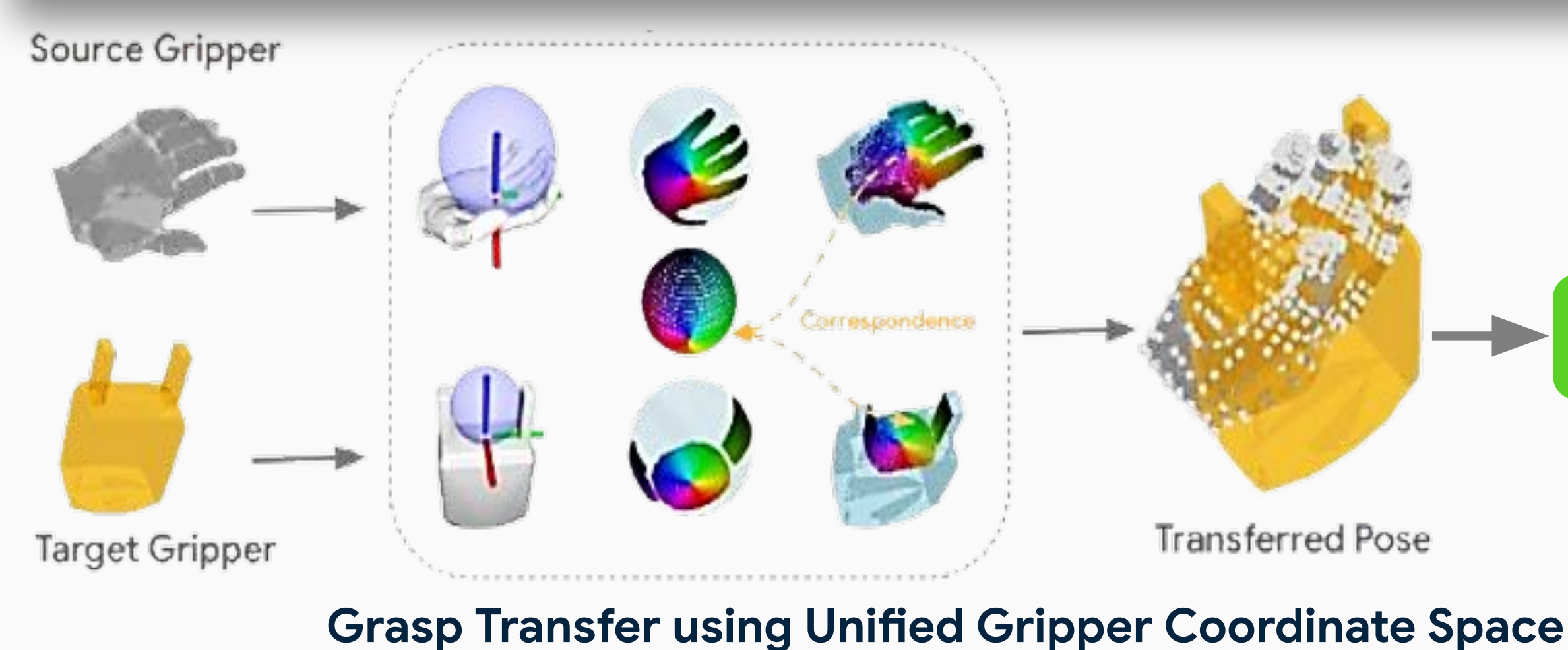
Stage I: Demonstration Collection



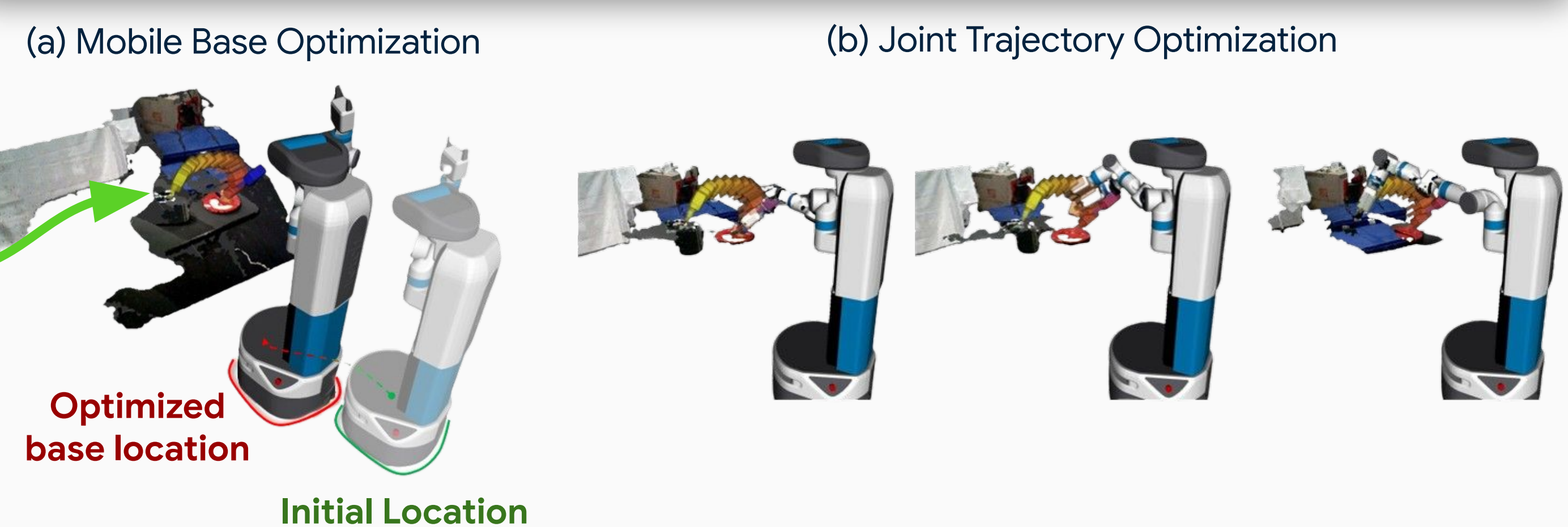
Stage II: Video Information Extraction



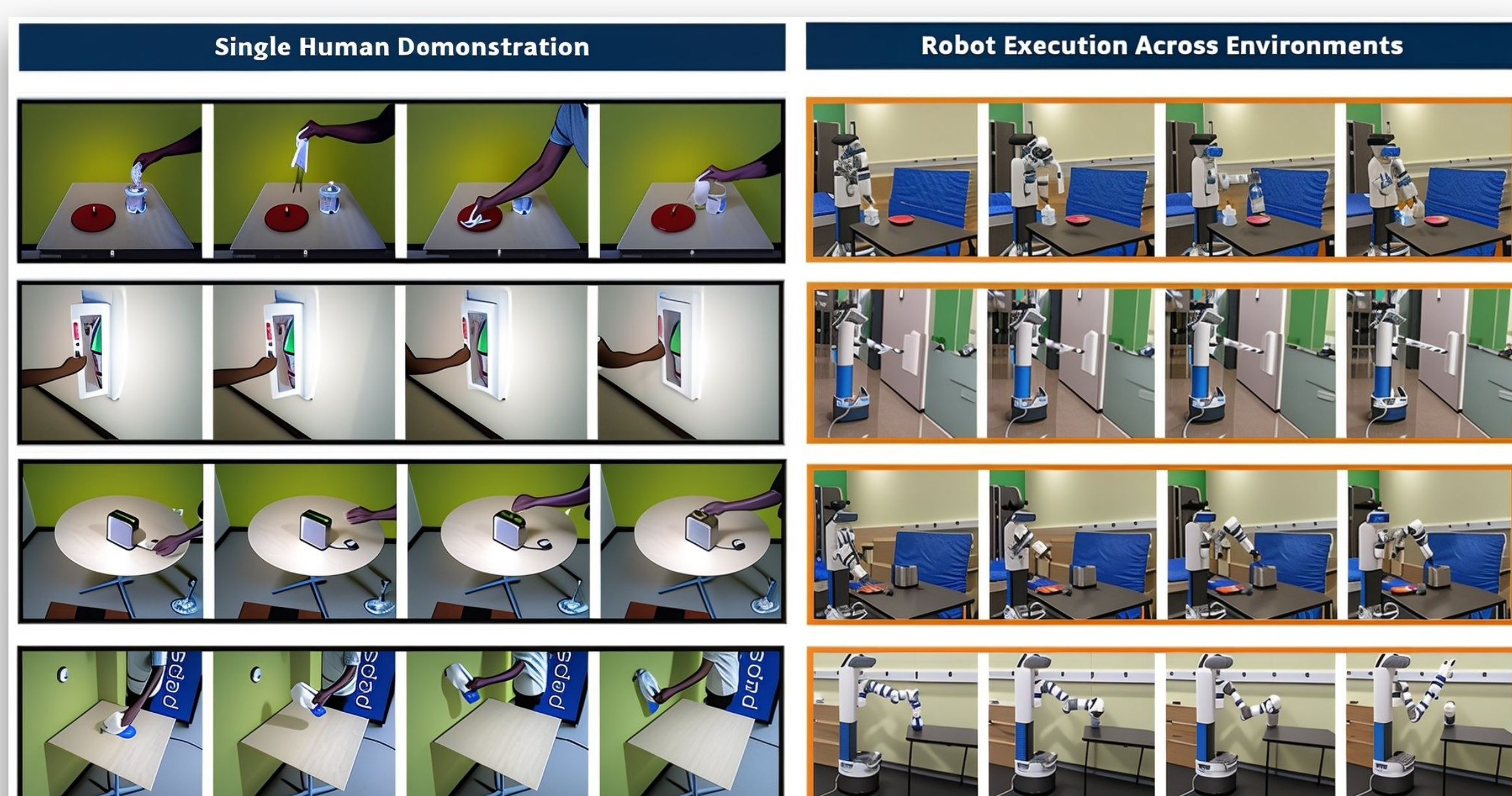
Stage III: Human to Robot Trajectory Transfer



Stage IV: Trajectory Optimization for Mobile Manipulation



Results



16 Tasks | 3 Trials | 48 real world rollouts
Baseline | 58% Grasp | 21% Success
Ours | 98% Grasp | 92% Success

Highlights

- ★ Training-Free Pipeline
- ★ Mobile Manipulation (base + arm)
- ★ Cross-Embodiment Capability
- ★ Real World Deployable
- ★ Hand based trajectory enables robust transfer compared to Object based trajectory.

Limitations

- ⚠ Depends on accurate pose estimation
- ⚠ Open loop execution (no feedback control)
- ⚠ Limited to demonstration object instances

Project Page
Scan Me!

