Bimanual Dexterity for Complex Tasks

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Visit **https://bidex-teleop.github.io/** for videos!

Bidex is an extremely dexterous bimanual system:

1) **Exceptional Dexterity:** Plate pickup, spraying a bottle, shirt folding, drilling

2) **Natural teleoperation:** 50DOF+ teleoperation using just your hands!

3) **Easy to replicate**: Under $12k for the teleop and 2x LEAP Hands. Works with many arms and in mobile settings.
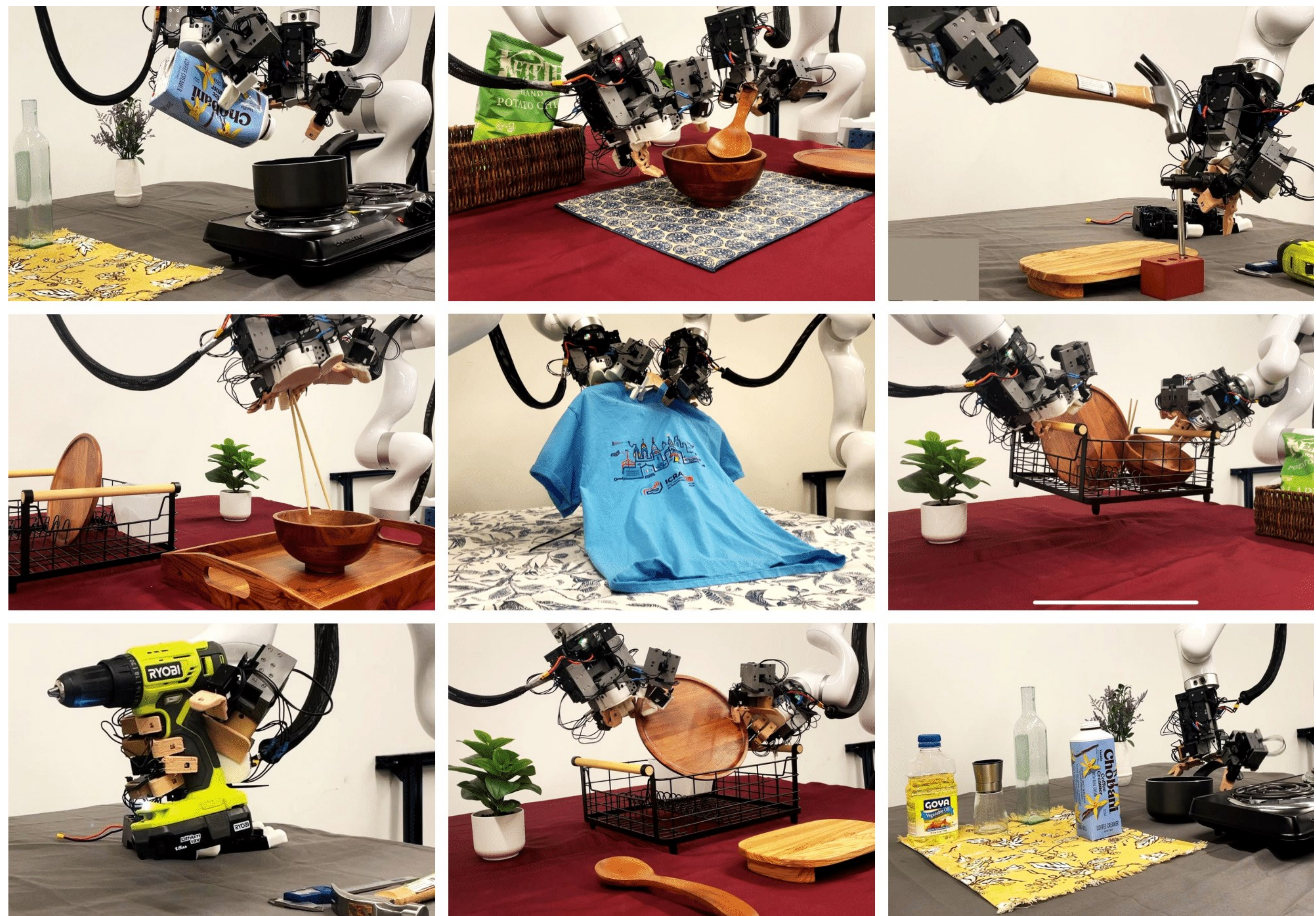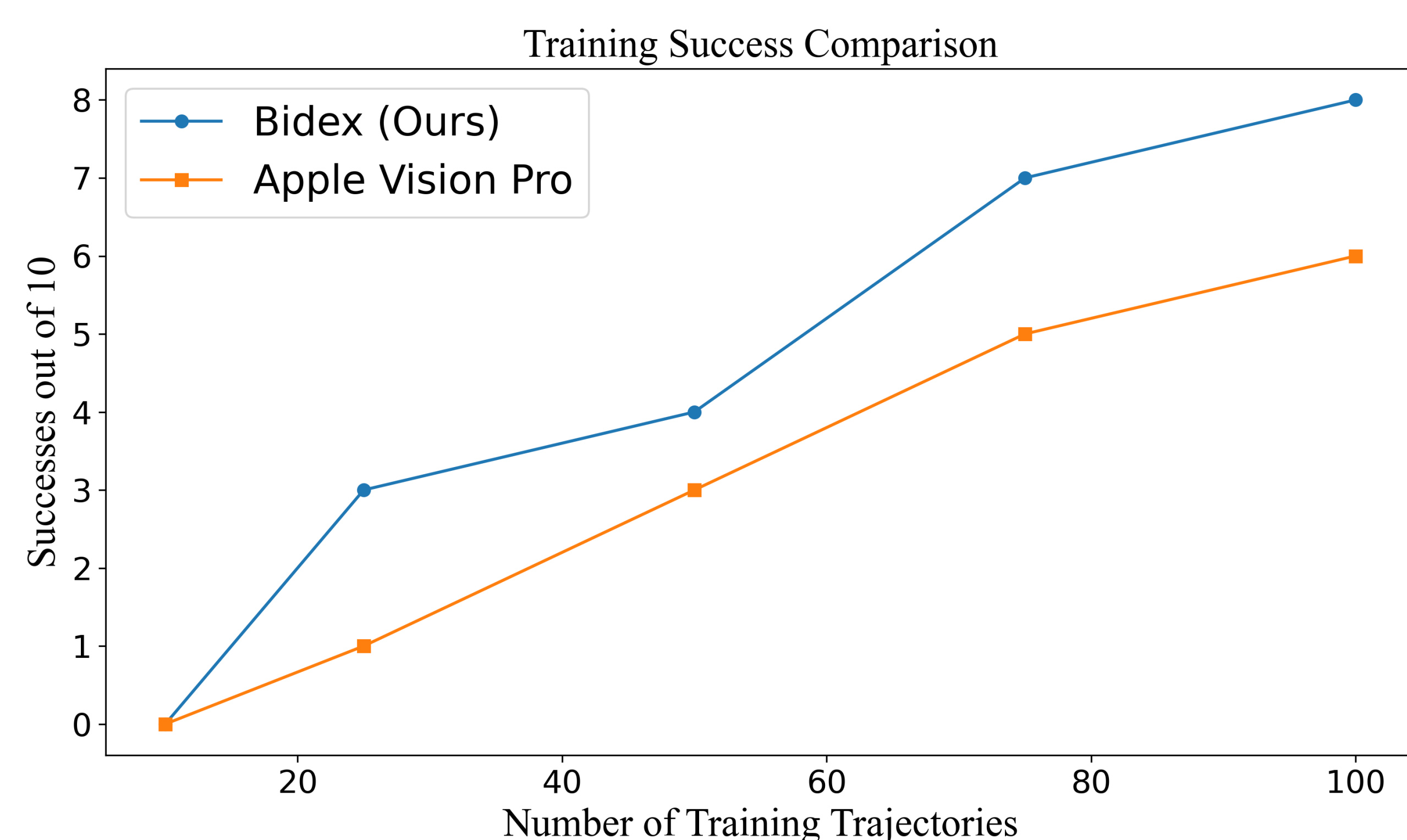

Bidex works seamlessly in mobile settings. One operator operates the arms and hands while another operates the mobile base and resets the task.


The operator wears two gloves and controls two arms and LEAP Hands naturally. The data is used to train behavior cloning policies which are pre-trained on internet videos.

Mounting Plate

Mocap Glove

Bearing Reinforcements
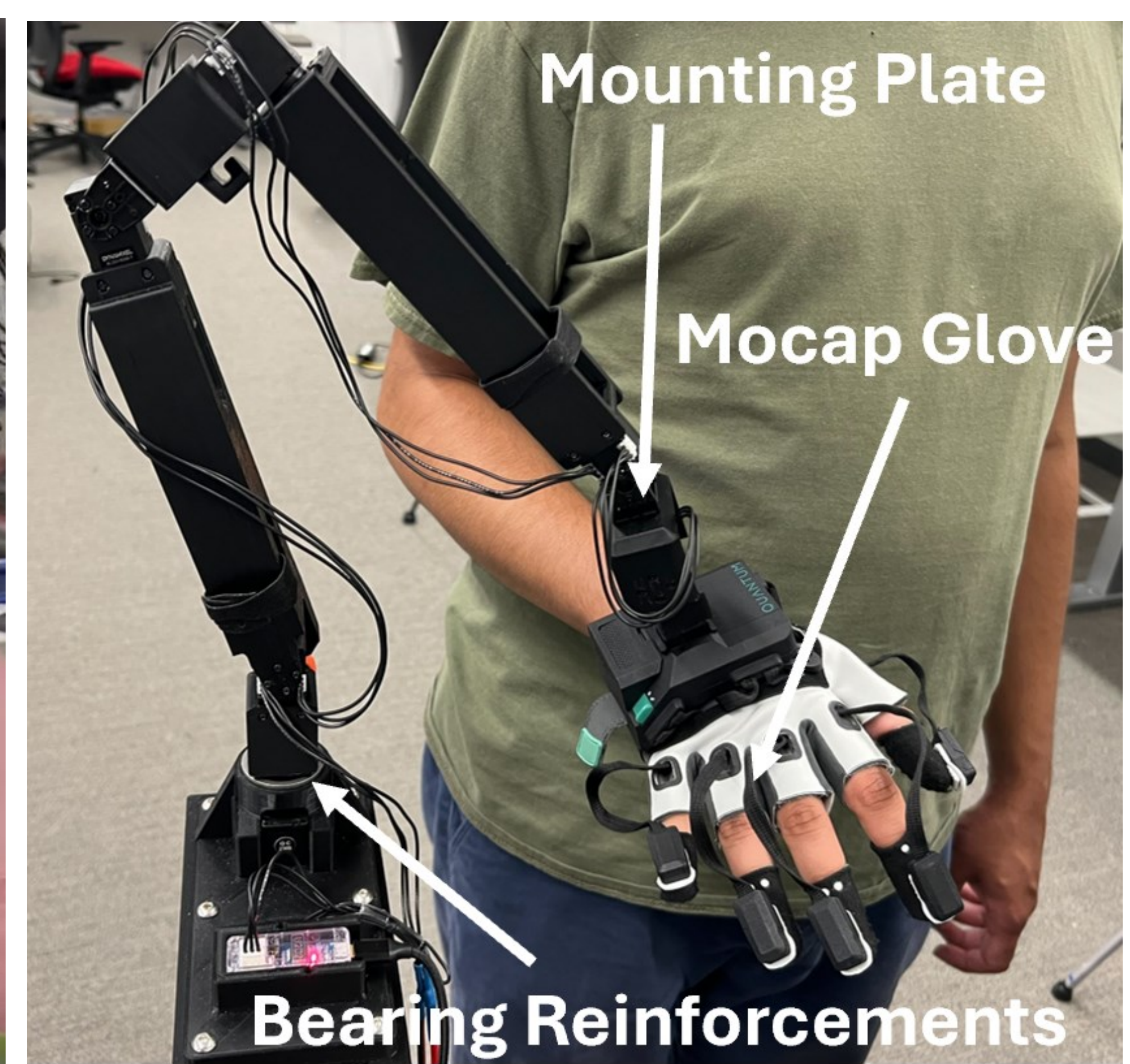
Our teacher arms are inspired by GELLO and attached to a Manus Meta Motion Capture Glove worn by the teleoperator.

Training Success Comparison

- Bidex (Ours)
- Apple Vision Pro

Successes out of 10

Number of Training Trajectories

Training autonomous policies with Bidex enables a higher success rate with less data than an Apple Vision Pro baseline. This is thanks to higher quality Bidex data.

User Feedback

Ratings

Bidex (Ours)
Apple Vision Pro

Accuracy   Responsiveness   Ease of Use   Confidence
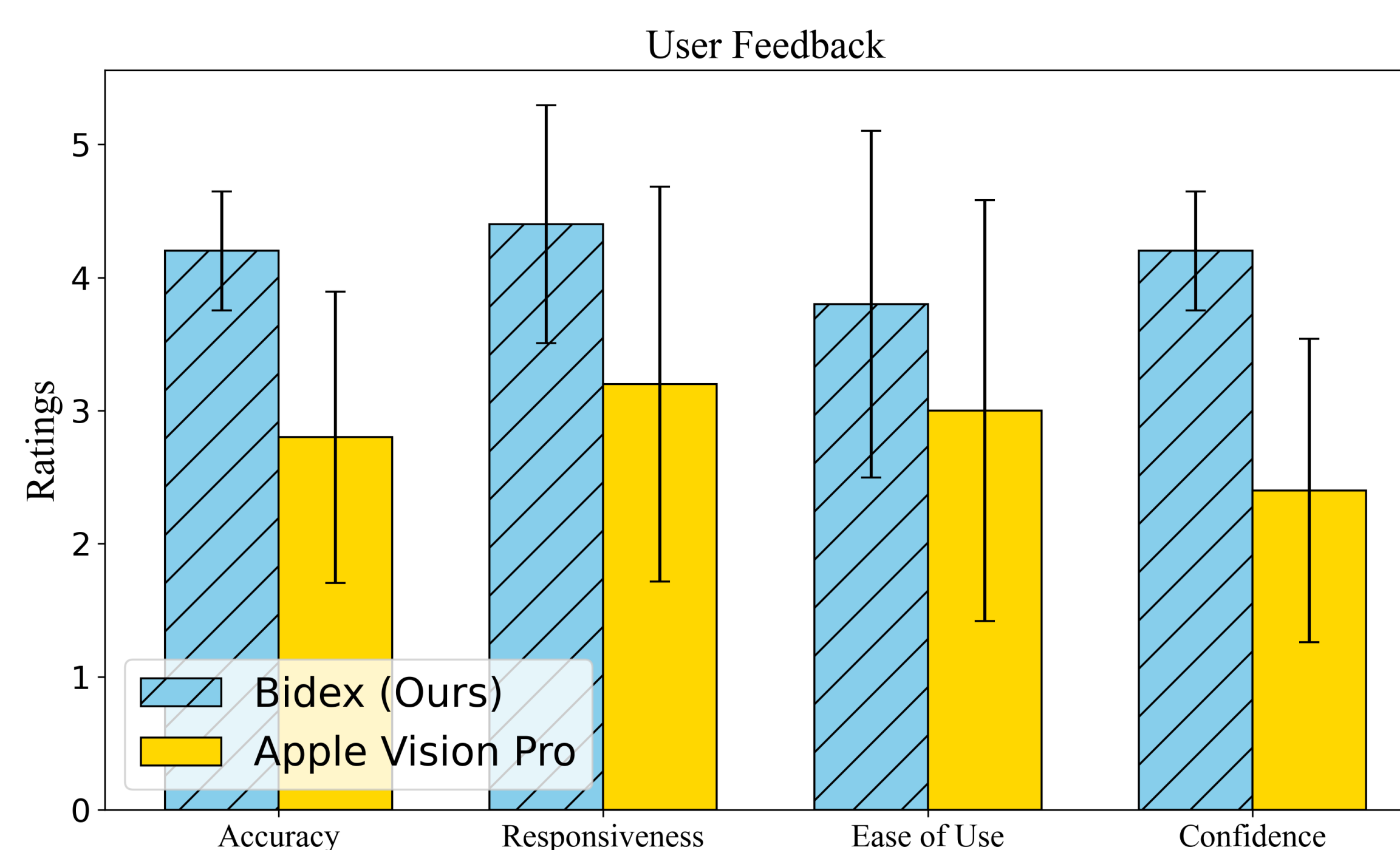
Novice operators find that Bidex is easier to use, more responsive and more confidence-inspiring compared to Vision Pro.

Object	Quantity	Total
Pair of Manus Meta Gloves	1	$6000
Dynamixel XL330-M288 (Gello)	12	$300
U2D2 Control PCB	2	$40
5v 20A Power Supply	2	$25
14 AWG Cabling	1	$20
PLA Printer Plastic	N/A	$10
Total		$6395

Bidex is low-cost and is easy to reproduce by any lab. It uses low-cost LEAP Hands and is compatible with many robot arms.