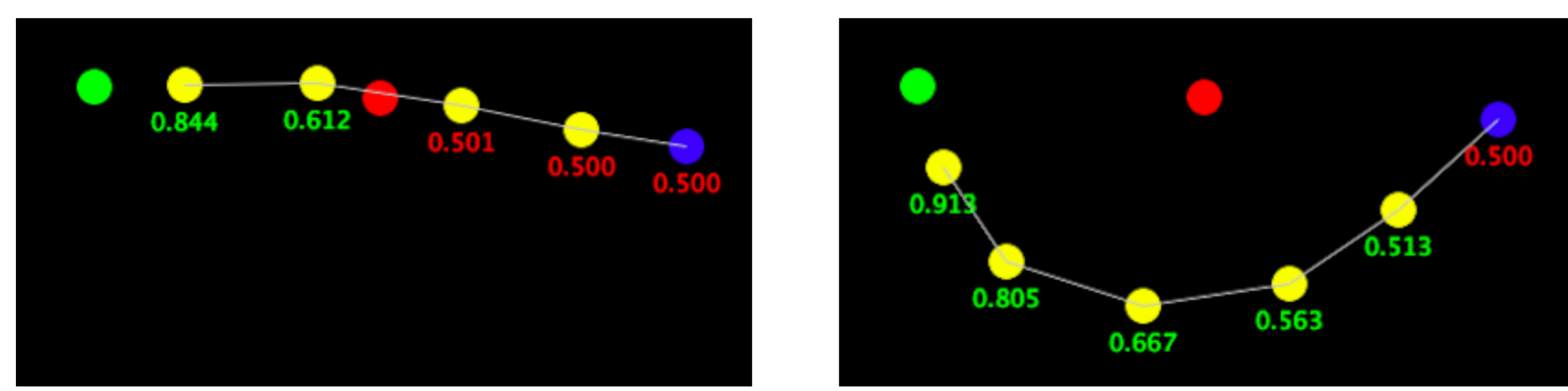


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Motivation

Even a perfect prediction algorithm makes mistakes due to noise from the interface. Users can increase the robustness of a prediction algorithm with legible motion.



(a) Ambiguous Trajectory

(b) Legible Trajectory

Start (●), Trajectory (●), Intended Goal (●), Distractor Goal (●), Prediction (0.x/0.x)

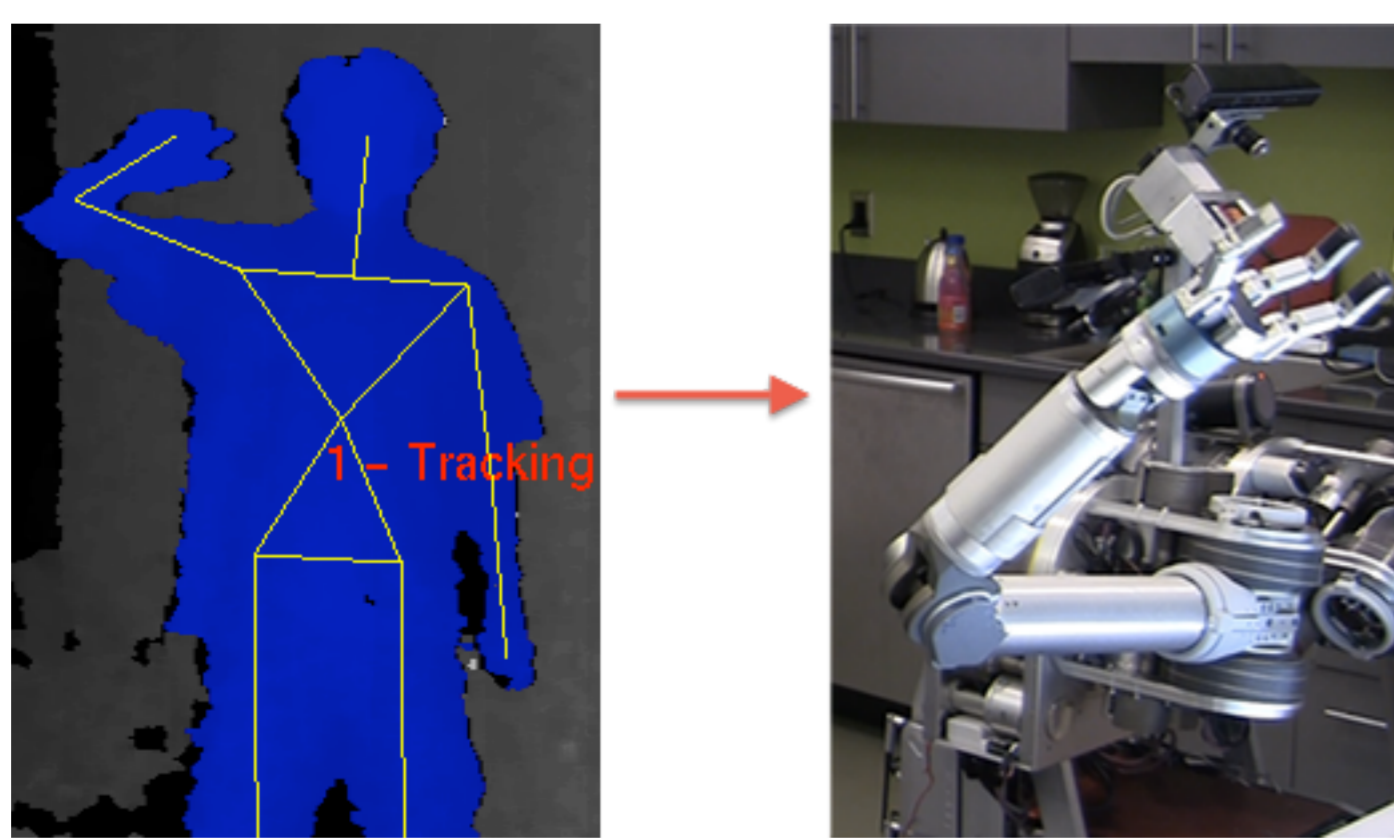
The correct goal is predicted with greater confidence and a larger margin of error when a legible trajectory is demonstrated.

Can users learn to provide more intent-expressive input to the robot?

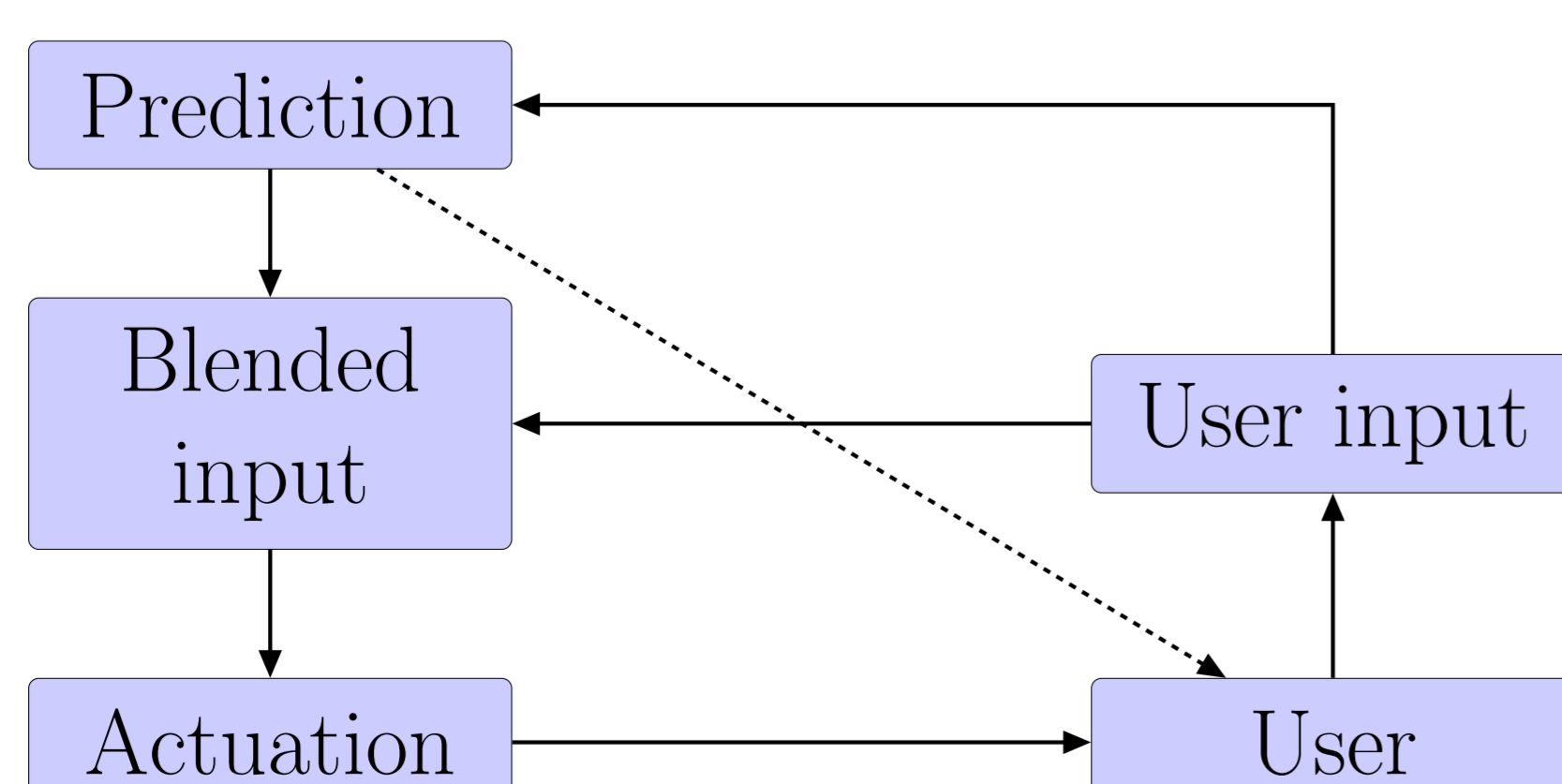
Insight

- ▶ Closed system
- ▶ User adaptation

Assistive Teleoperation



Joint mapping from the user's arm to the robot's arm



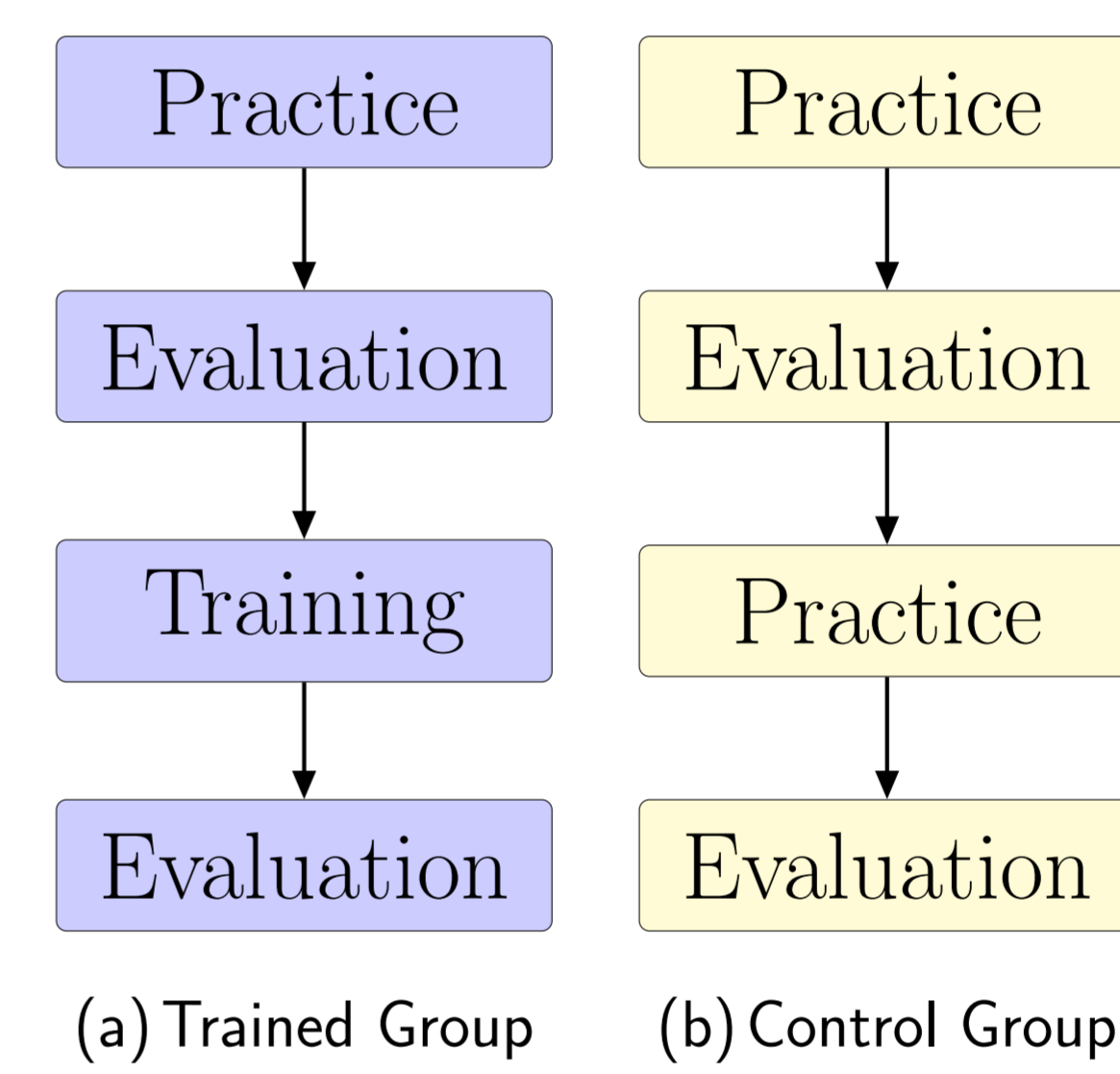
Assistive Teleoperation System: We hypothesize that the transparency of the predictor will facilitate legible motion.

Metric of Legibility

$$L = \frac{\sum_{s \in \text{trajectory}} P_s(G_{\text{predicted}} = G_{\text{intended}})}{|\text{trajectory}|}$$

User Study

Hypothesis: Users can significantly improve legibility with explicit training from the predictor.



(a) Trained Group

(b) Control Group



Training Interface: Size of the blue ring indicates the predictor's confidence

Preliminary Results

- ▶ Preliminary data suggest that users can significantly improve their ability to demonstrate intent with legible motion
- ▶ $t(188) = 0.278, p = 0.024$

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