

Latent Flow Waypoints for Latent Planning



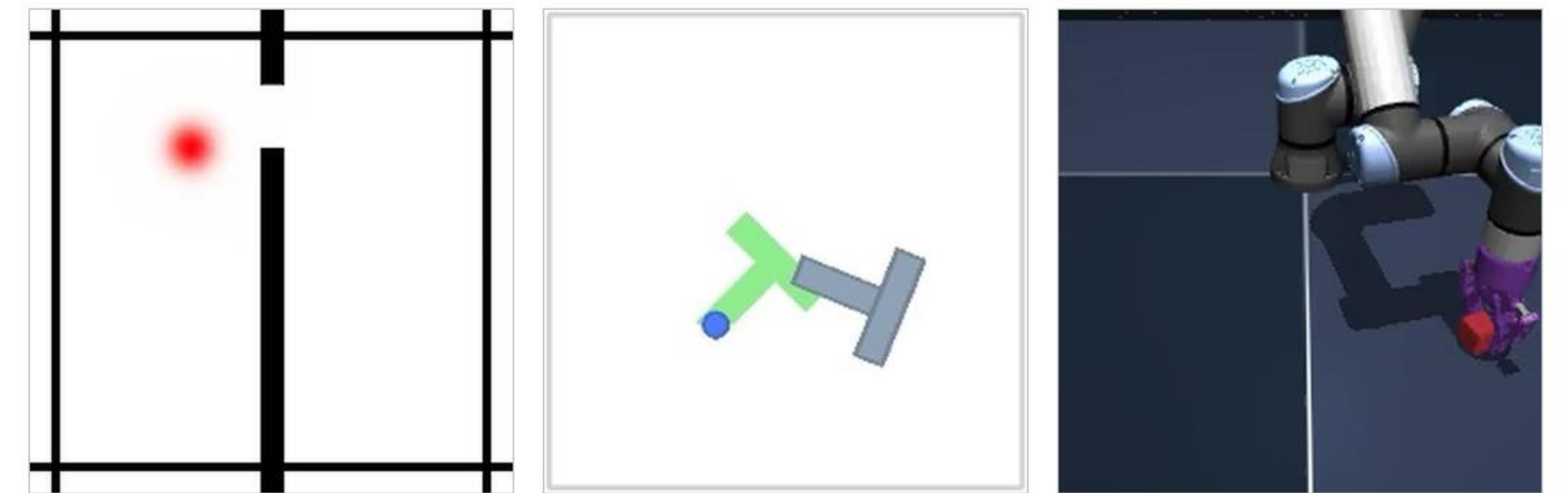
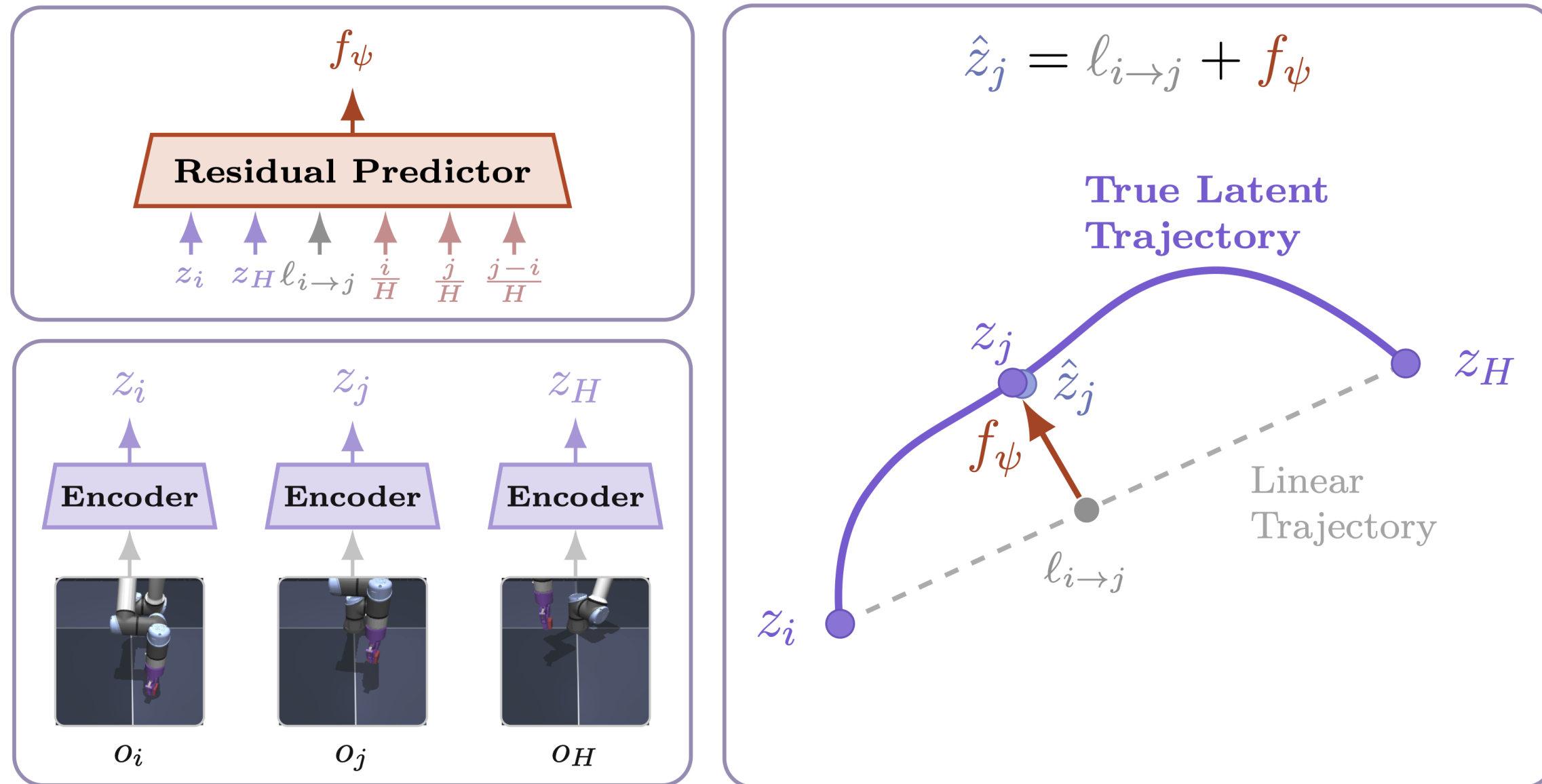
agentic learning
ai lab

Ryan Teehan & Mengye Ren
Agentic Learning AI Lab, New York University



Terminal goals provide little signal for finding useful intermediate states when solving long-horizon or difficult tasks with latent world models. Can we generate effective intermediate guidance in latent space?

A residual model corrects linear interpolation to match plausible latent trajectories

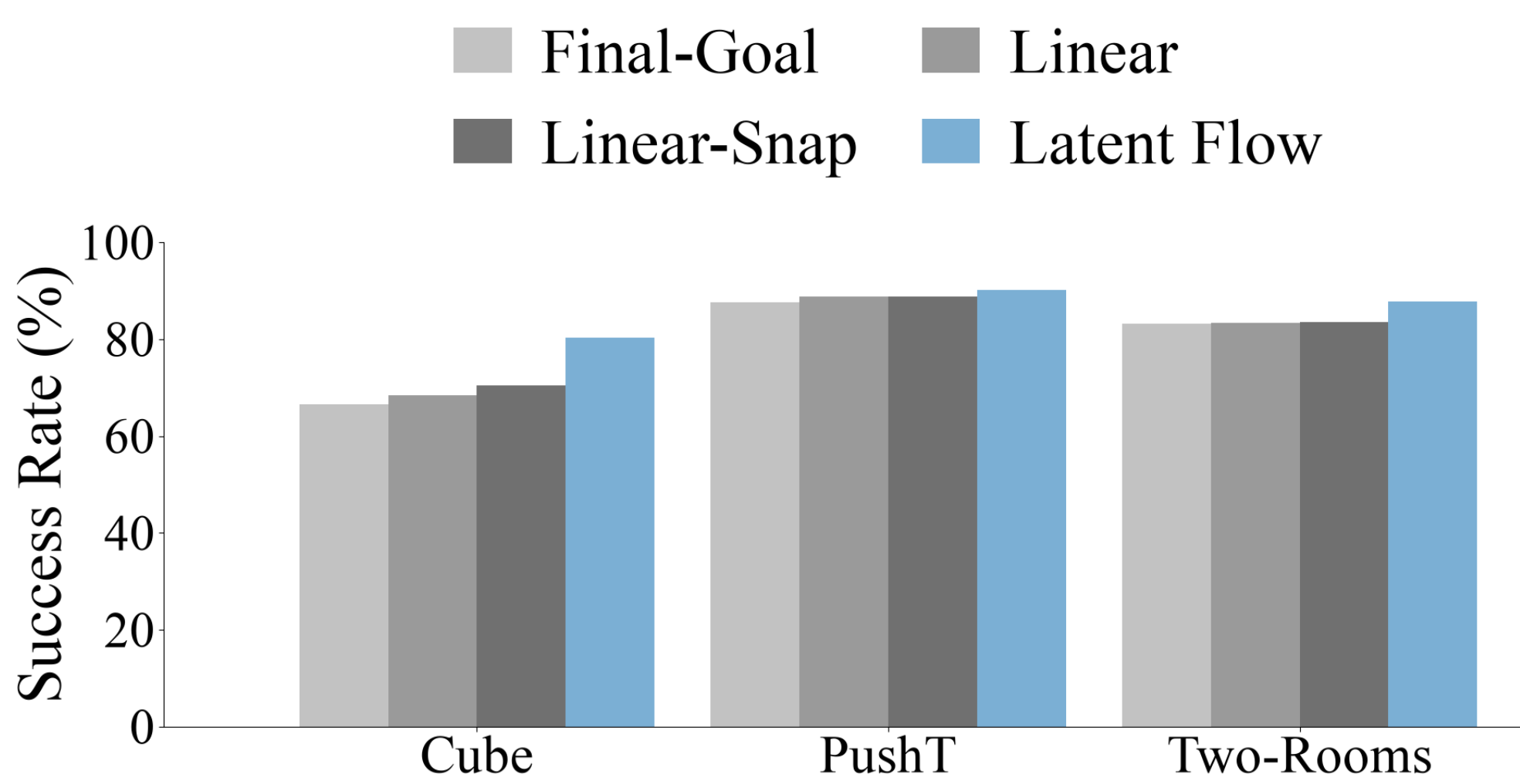


Two-Rooms (Left): navigate from one room to a target in another room through a doorway.

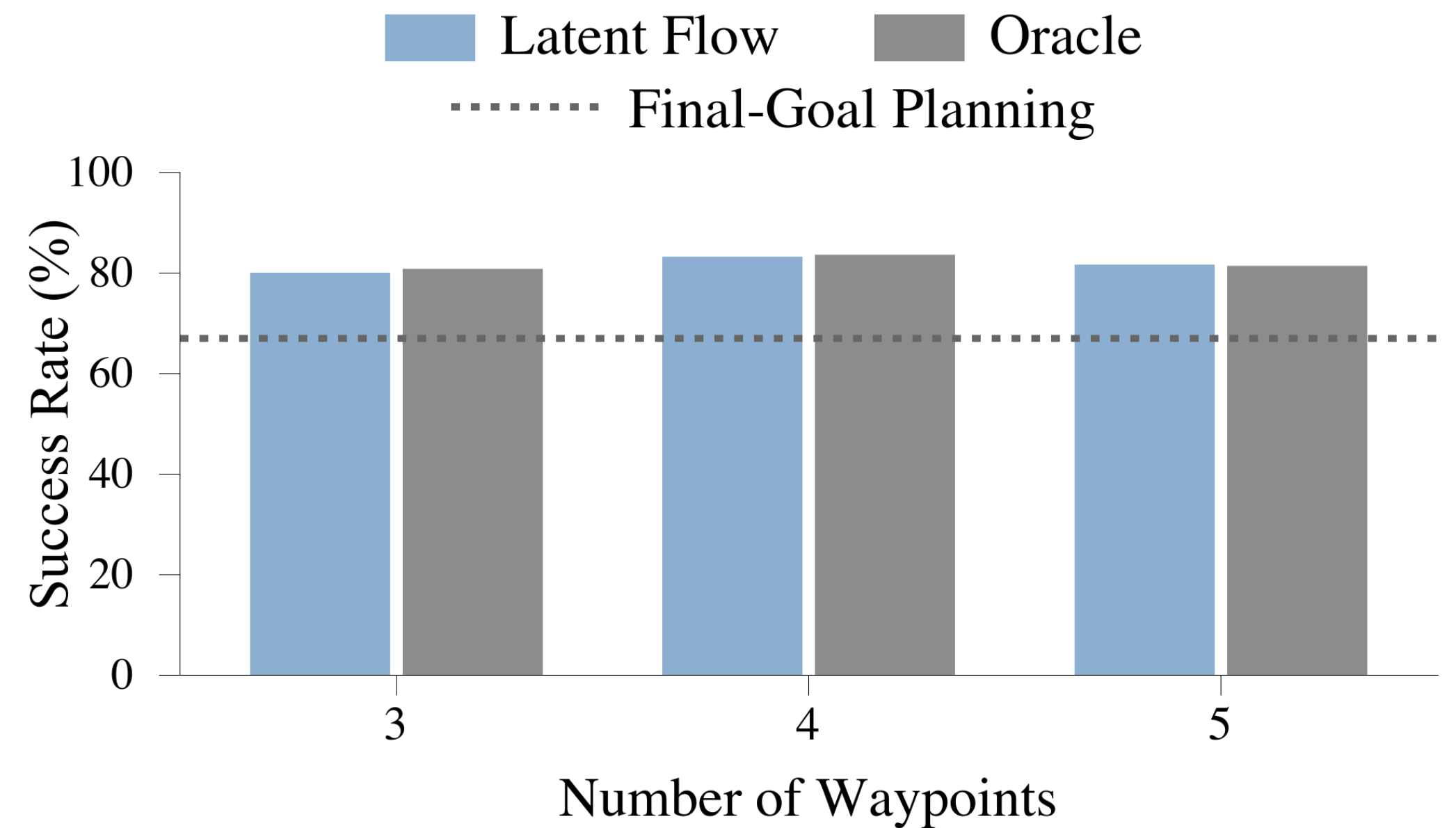
PushT (Center): push a T-shaped block to a goal pose.

Cube (Right): pick up and place a cube in a target position.

Planning improves across tasks & matches oracle waypoint guidance

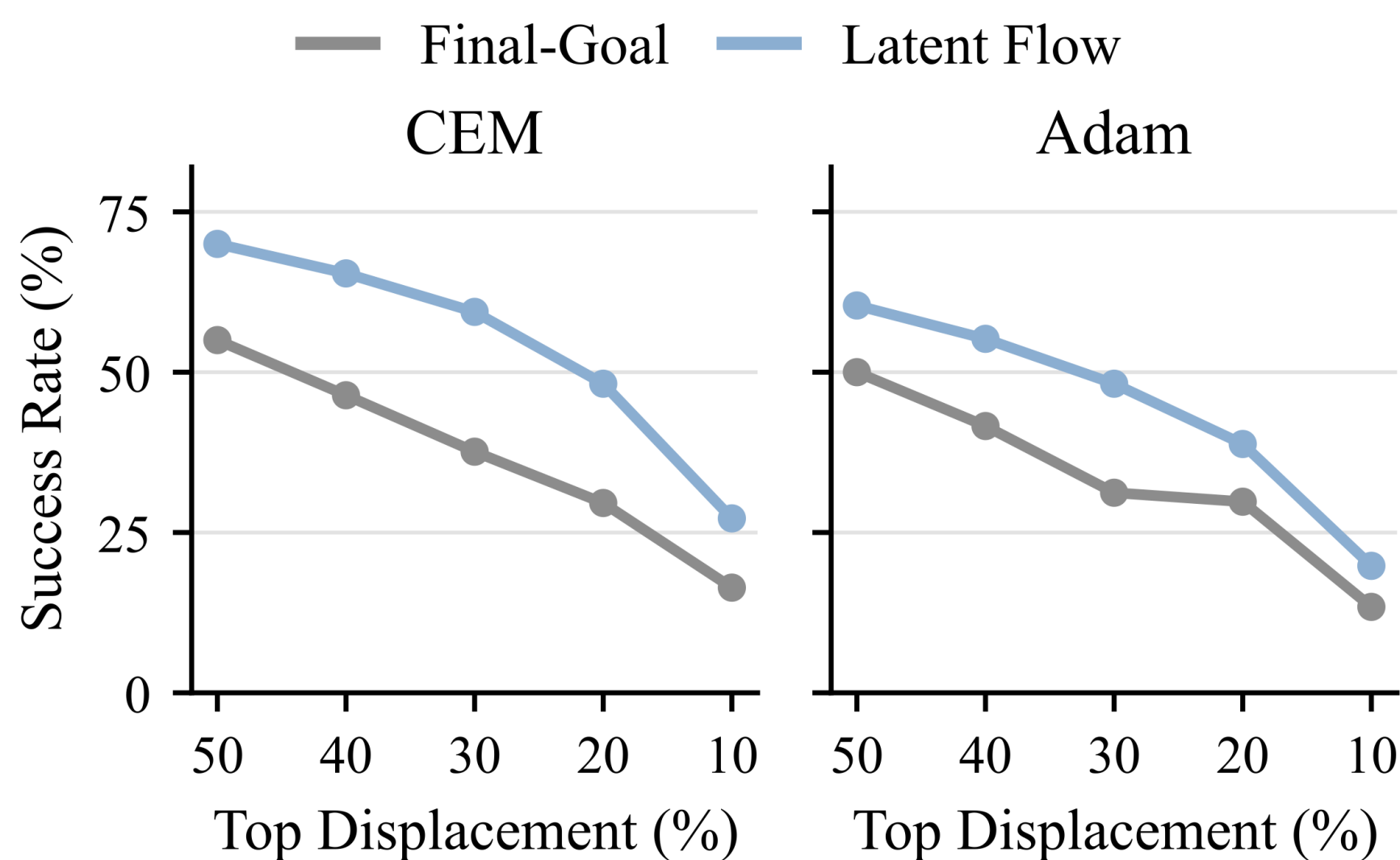


Cube: 66.6% to 80.4% (+13.8 pp)

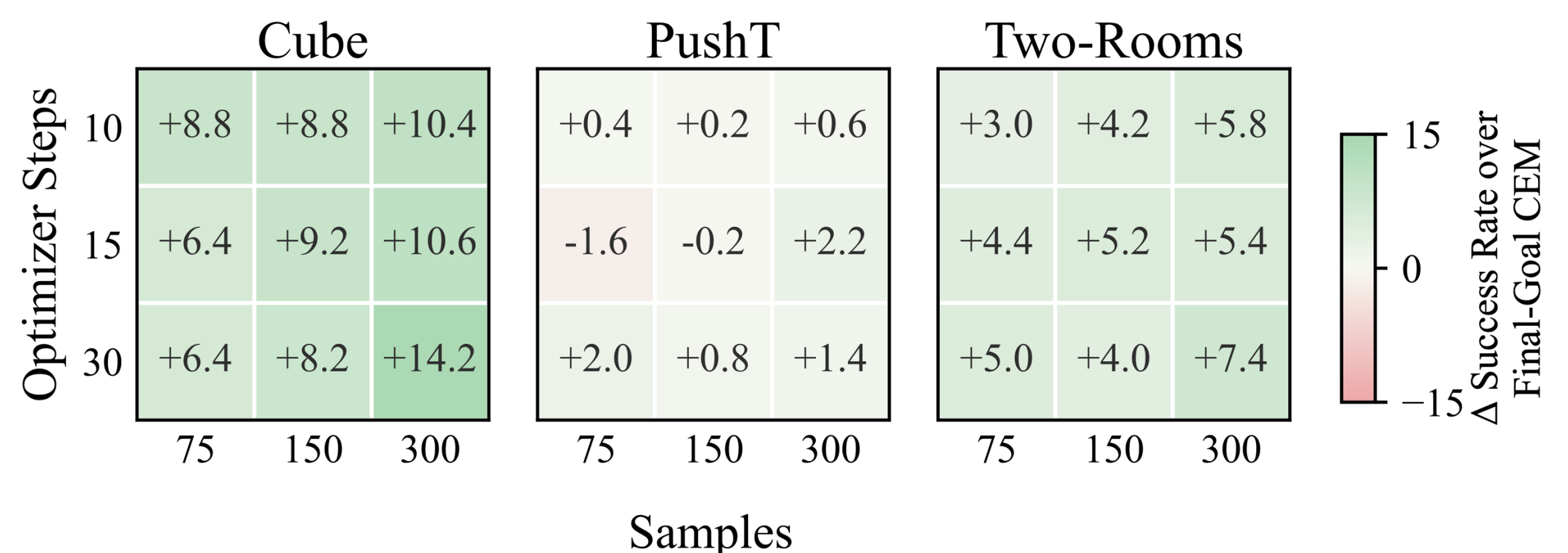


Latent Flow Waypoints are particularly beneficial in difficult settings

High-displacement Cube



Constrained CEM planning budgets



70.4% with 75 samples × 10 steps, outperforming full-budget Final-Goal CEM

Decoded latent-flow waypoints stay visually coherent



Linear interpolation waypoints become blurry mid-trajectory, precisely when guidance is needed.

Over 40% closer to real dataset and oracle frames than Linear waypoints.