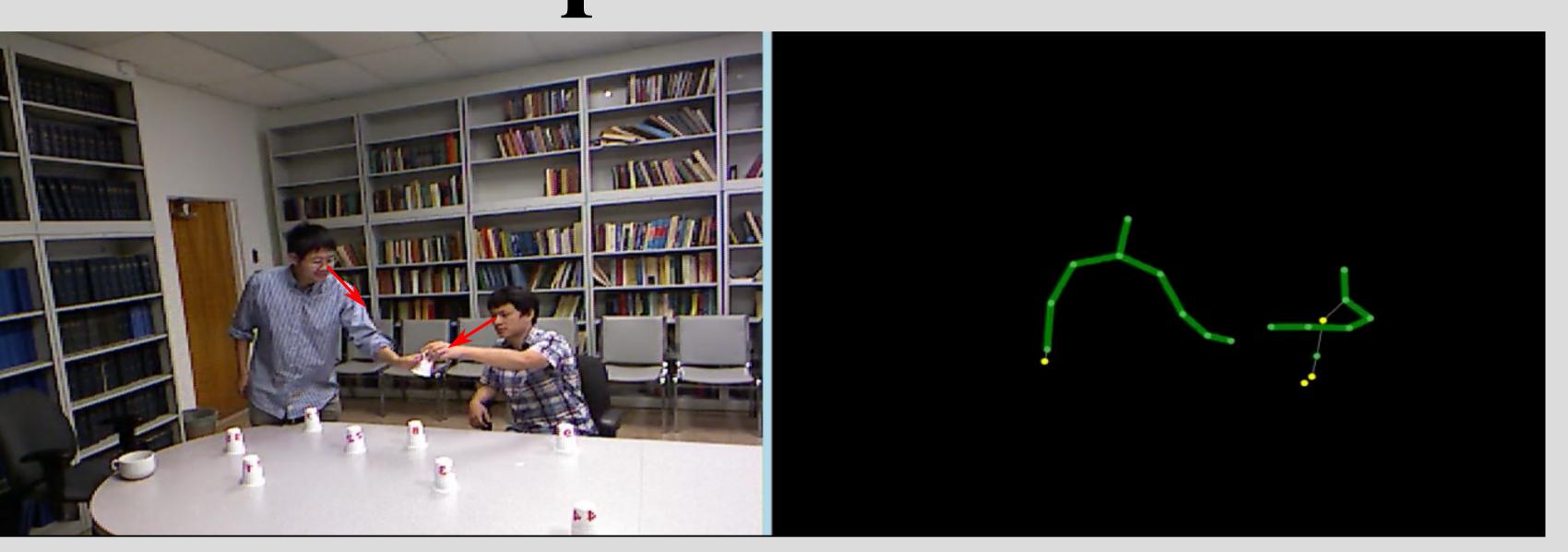
What are you looking at? The acuity of joint attention

Tao Gao, Daniel Harari, Joshua Tenenbaum & Nancy Kanwisher (MIT)

Motivation

Social Perception in Real Scenes



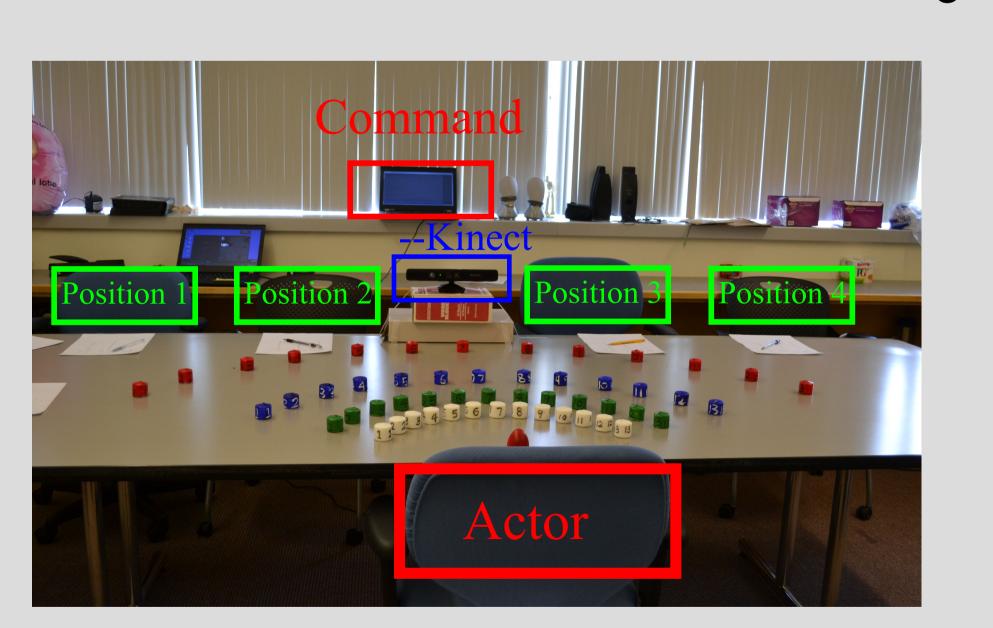
Gaze perception towards third-party objects?

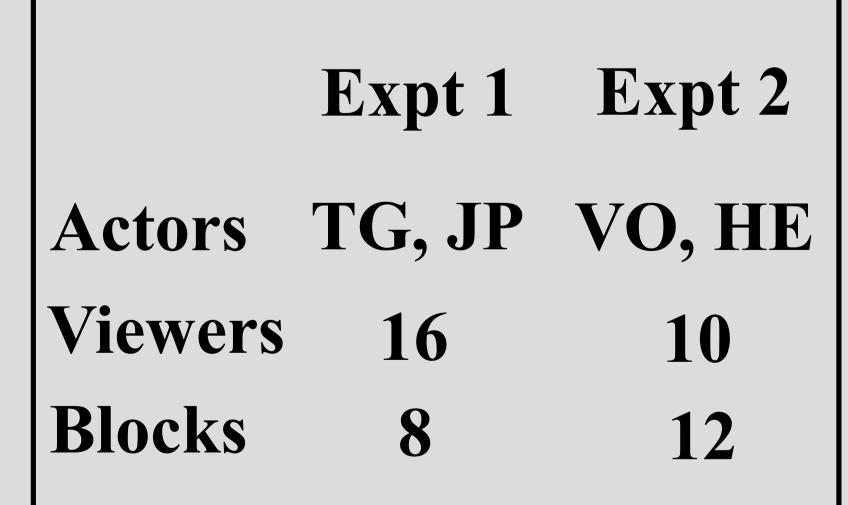
Fundamental to joint attention ...

- 1. Natural looking
- 3. Actors and Viewers
- 2. Crowded targets
- 4. Human vs. Model

Method

Task: What are you looking at?

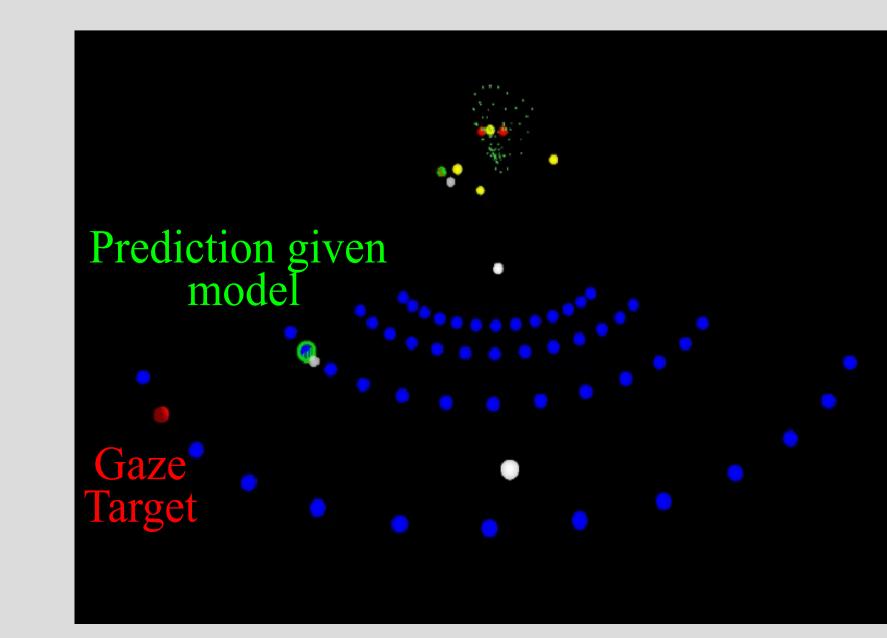




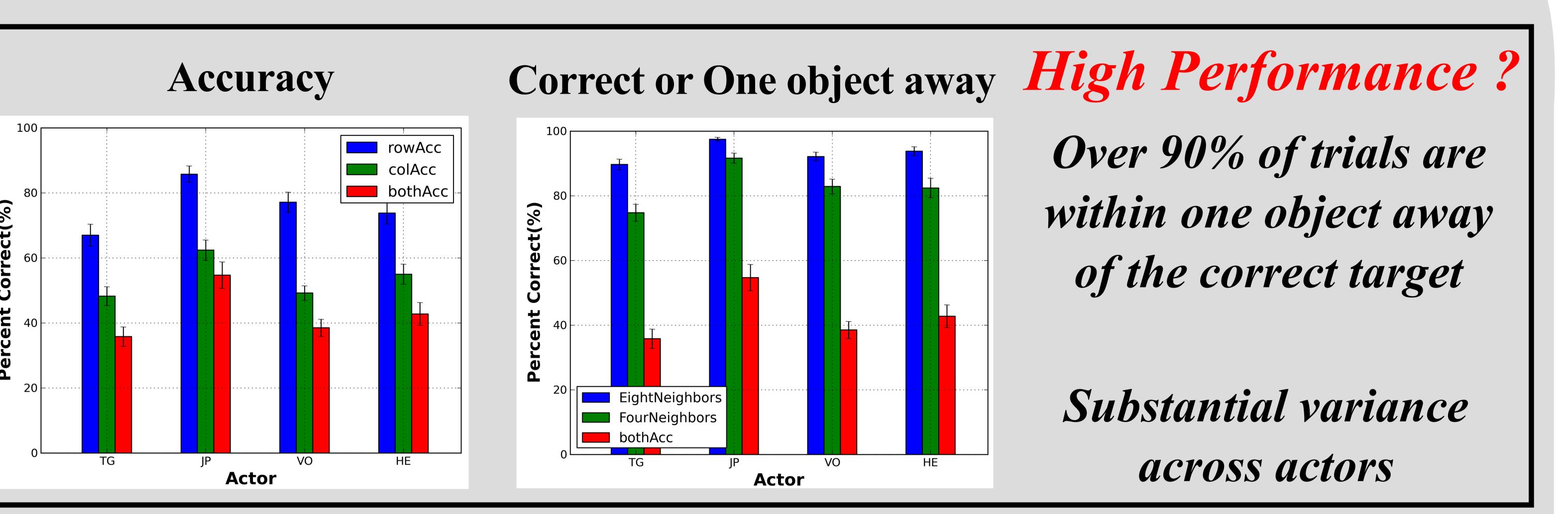
Face Tracking

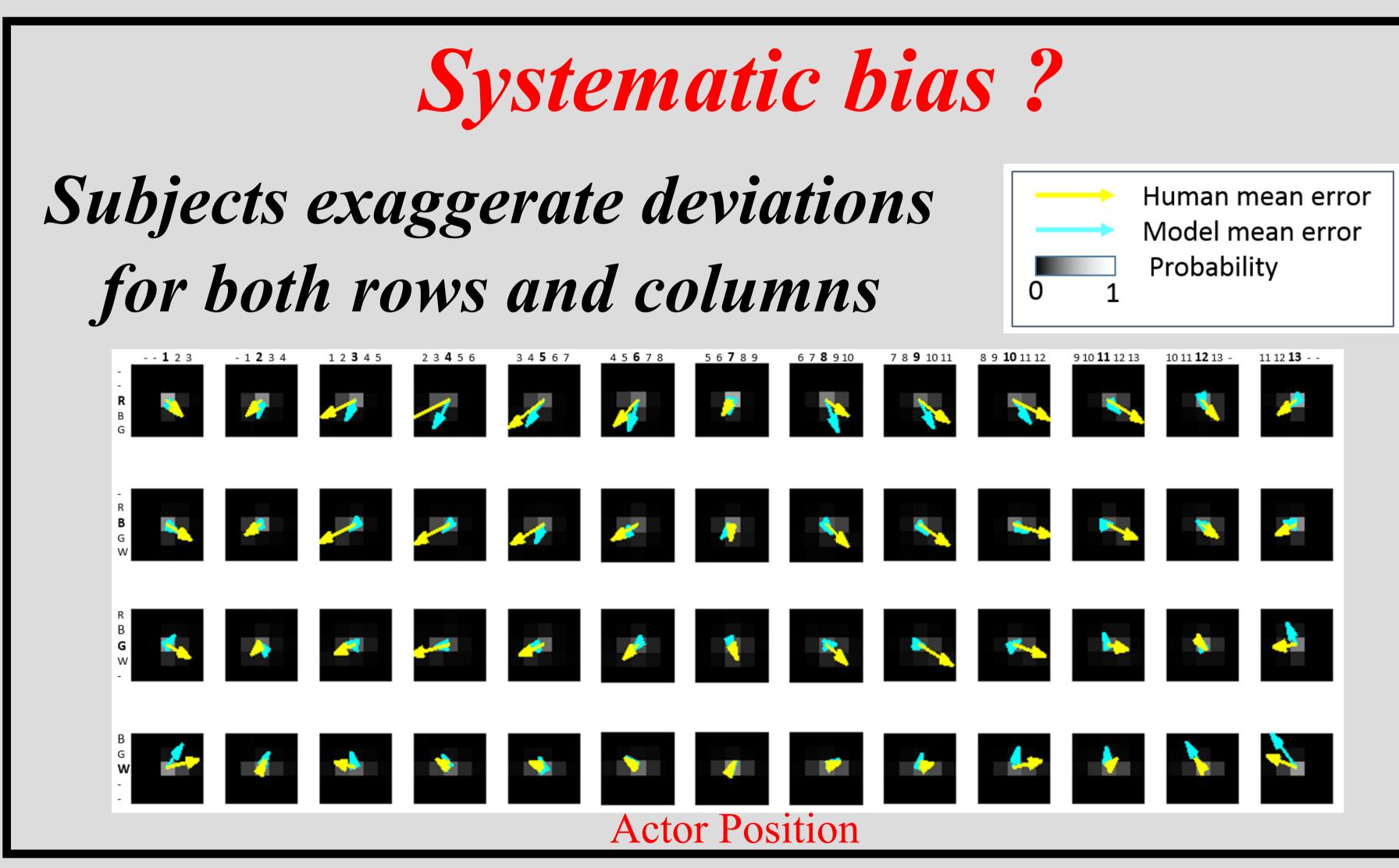


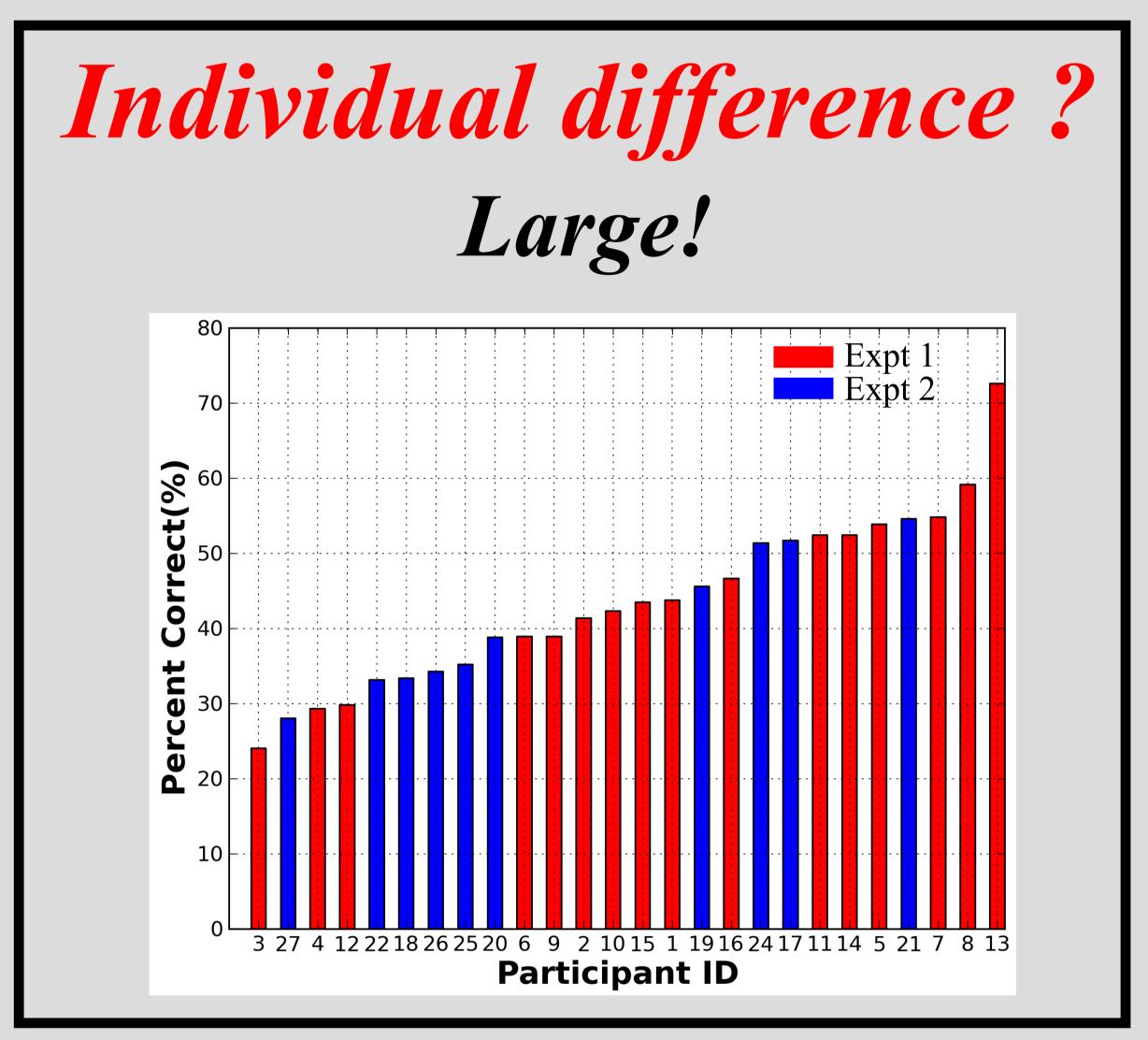
3D Reconstruction

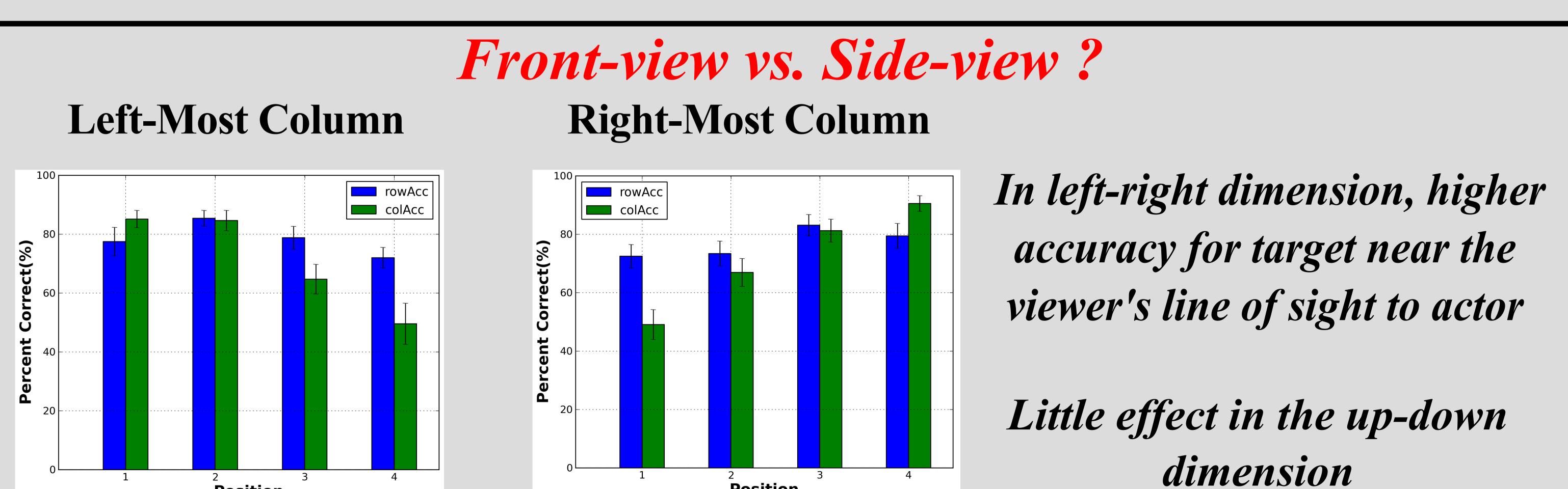


Behavioral Results

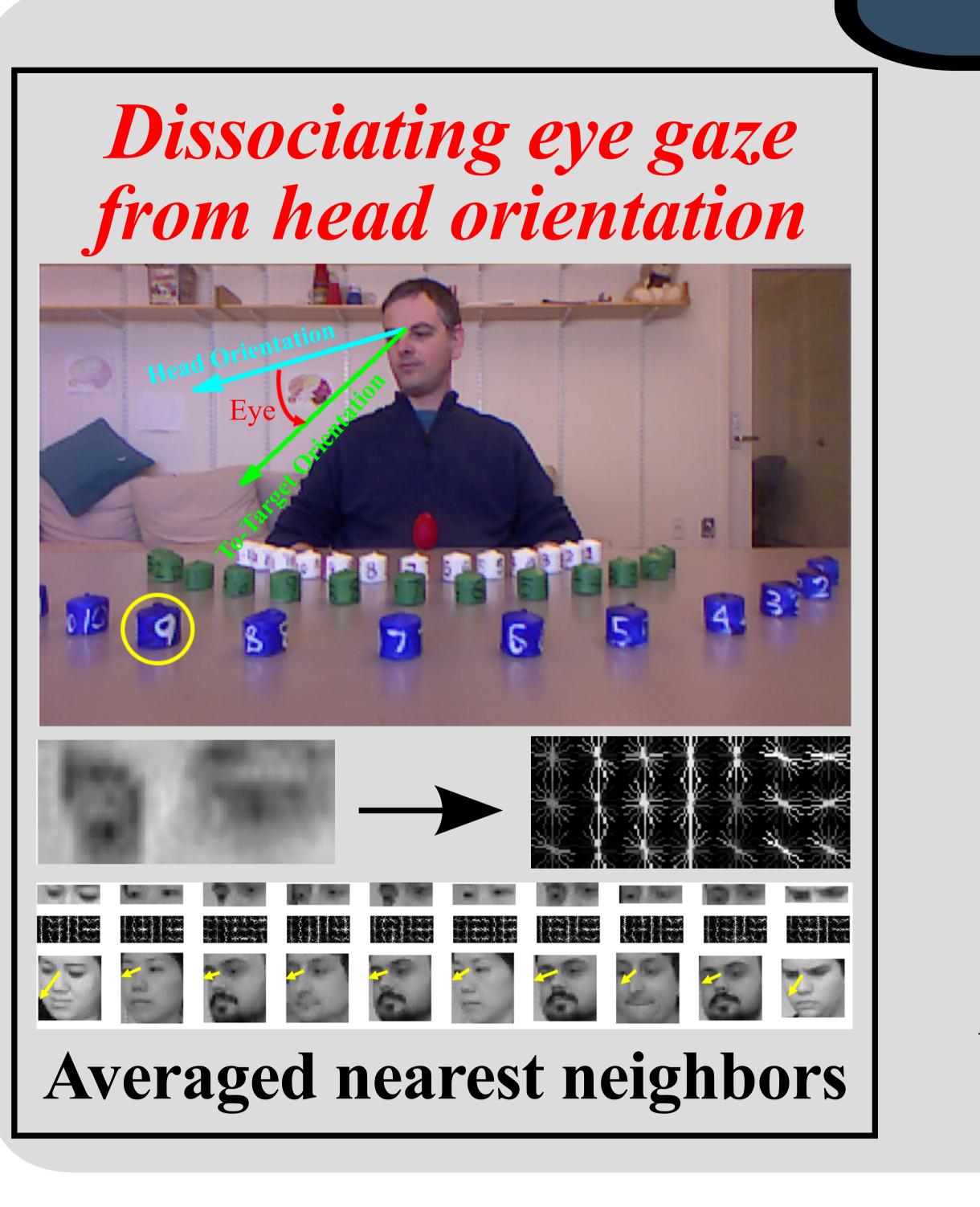


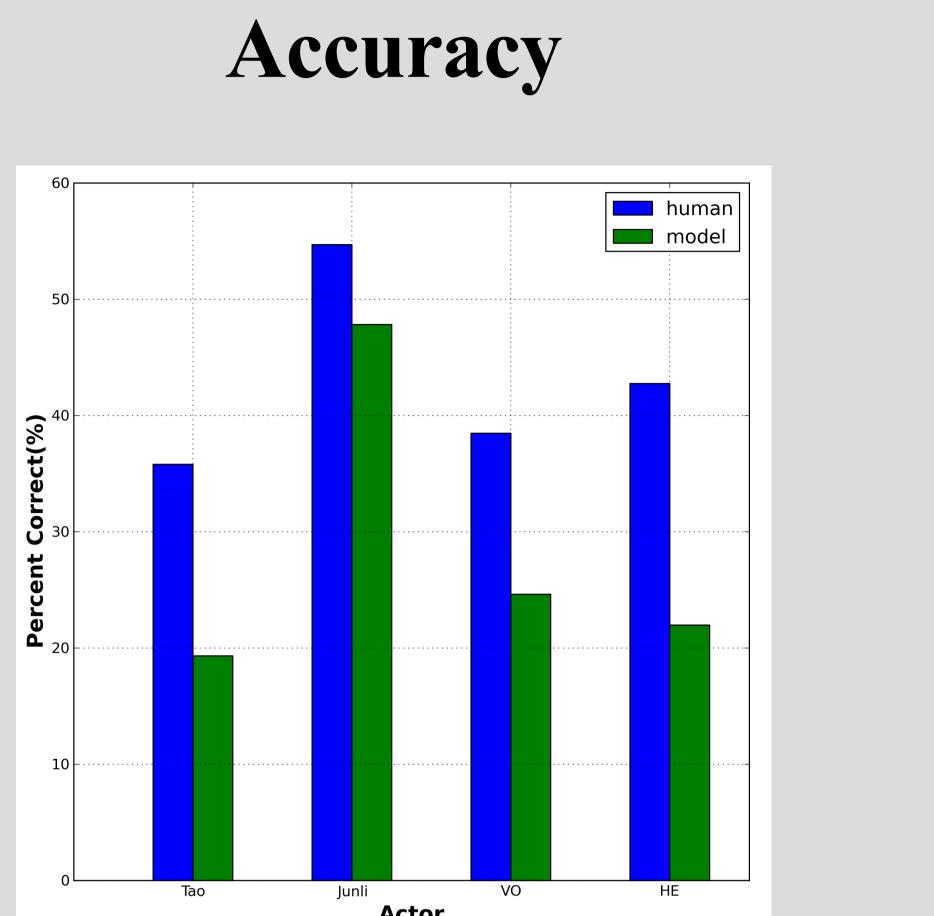




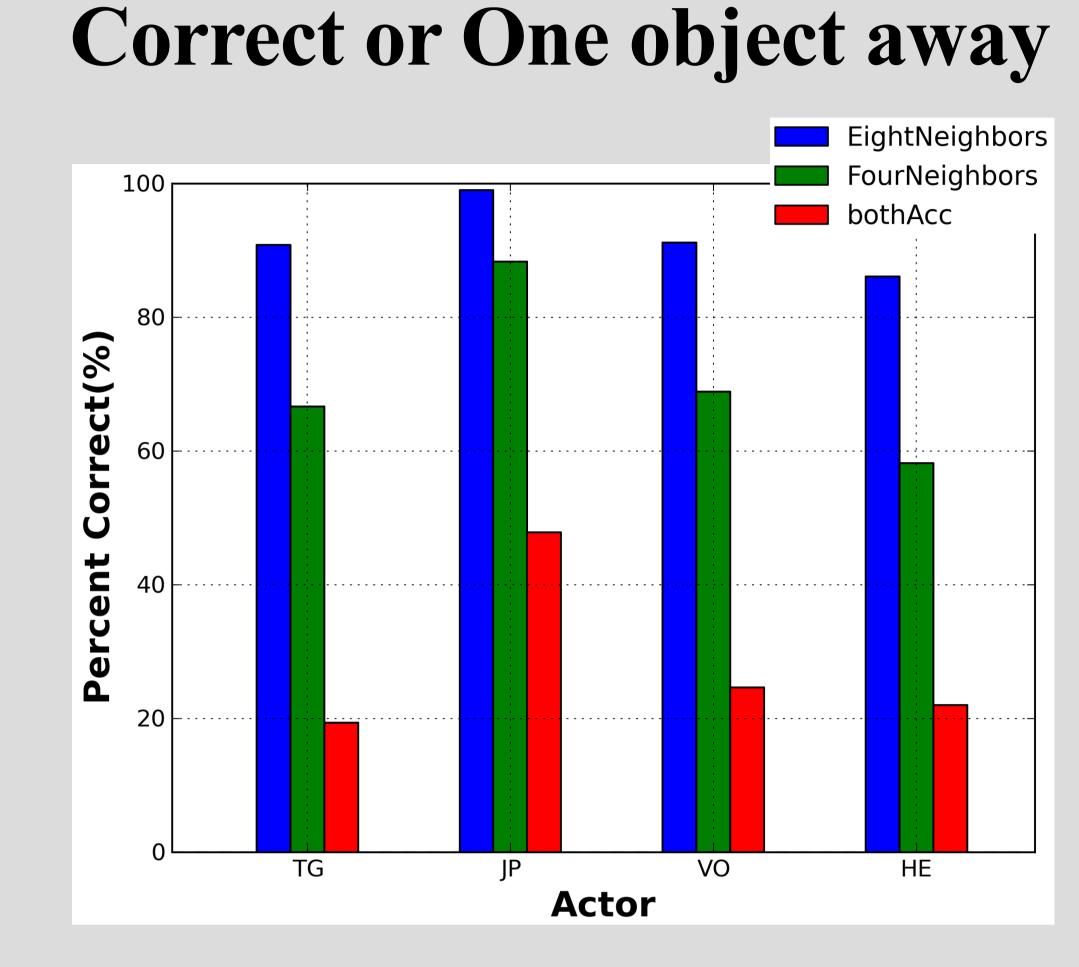


Modeling





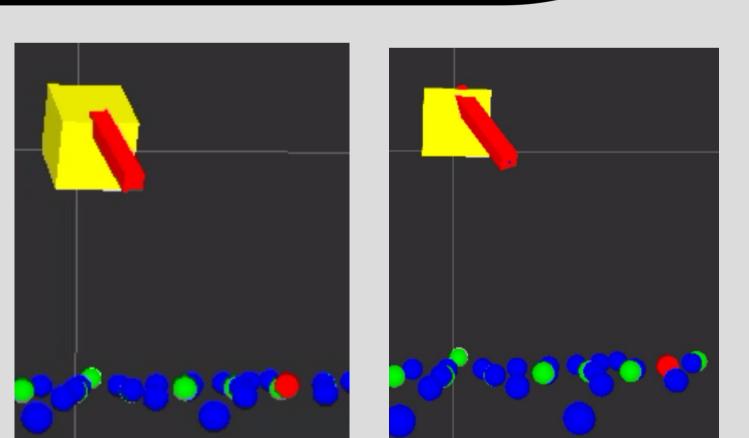


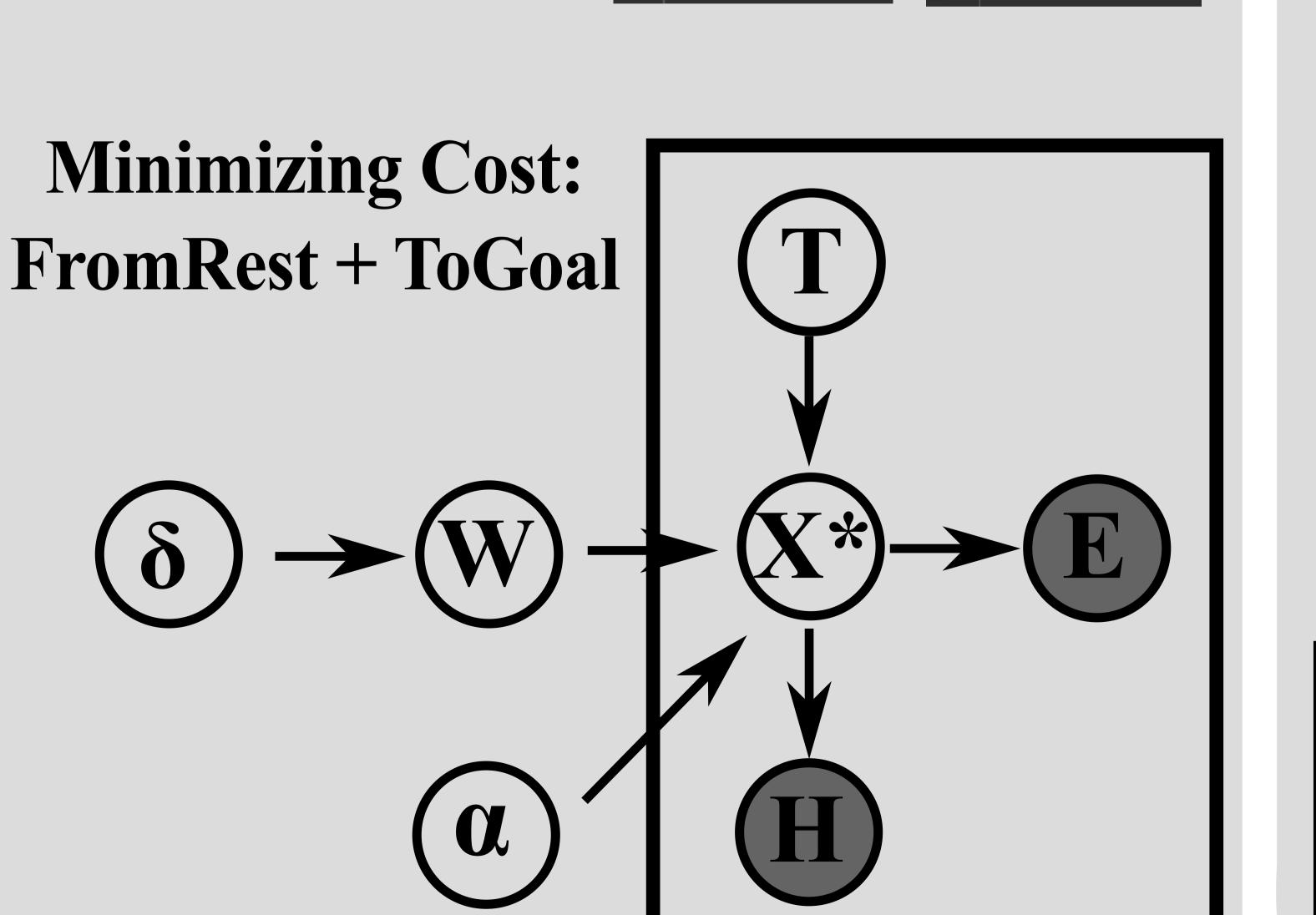


Model captures acrossactor variance

Generative Model

Gaze perception as inverse optimal control





Conclusions

- 1. Humans outperform state-of-the-art computer vision models
- 2. Performance varies substantially across actors, viewers, and viewing angles
- 3. Human-model gap suggests the importance of head-gaze trajectories and scene context ...

Hypothesis:

This acuity may be sufficient for joint attention in natural environments.