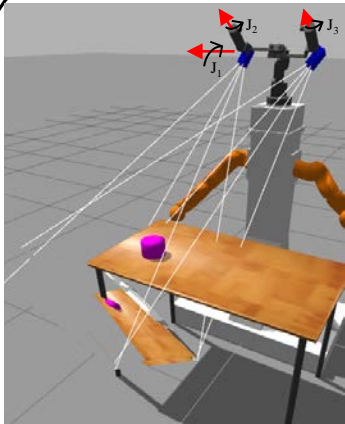






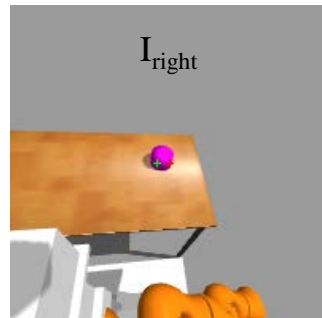
Learning vergence using deep reinforcement learning and an unsupervised reward



Joint 
Direction of rotation (+) 
Image center 
Object pixel detection 

3 DOF: two pan angles (J_2 and J_3) and one joint tilt angle (J_1)
States: $S = \{I_{\text{left}}, I_{\text{right}}, q\}$
Actions: $A = \Delta q = \{\Delta J_1, \Delta J_2, \Delta J_3\}$

Goal : Train a neural network mapping $\pi_{\theta}: S \rightarrow A$ that does vergence



Objective:

Autonomous learning of vergence using two pan-tilt cameras

Motivations:

- Automatic choice of features
- Generalization to unseen objects or other environments
- No need for calibration

Learning framework:

Deep deterministic policy gradient algorithm (reference in the poster)

Contributions: related to the reward function

- No need for prior knowledge
- Reward computed in a curiosity mechanism
- Reward informative while being unsupervised