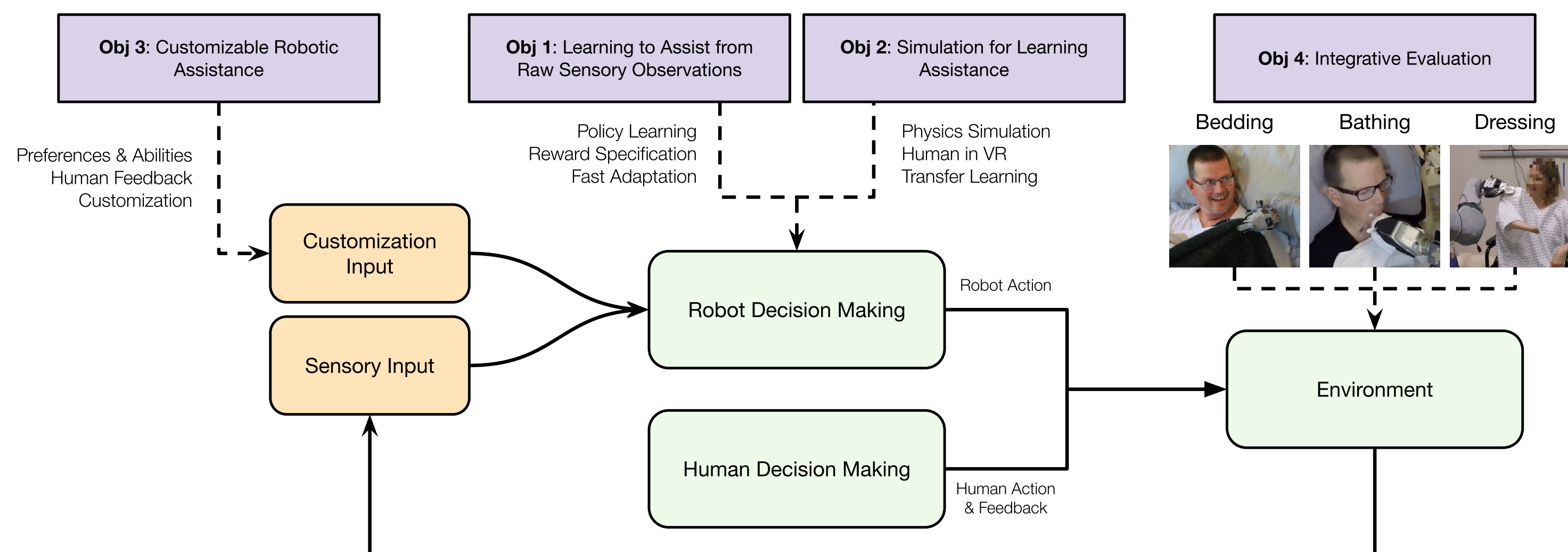# Collaborative Research: NRI: INT: Scalable, Customizable, Robot Learning with Humans

PIs: Pieter Abbeel, Anca Dragan (UC Berkeley), Charles Kemp (Georgia Institute of Technology), Deepak Pathak (Carnegie Mellon University)
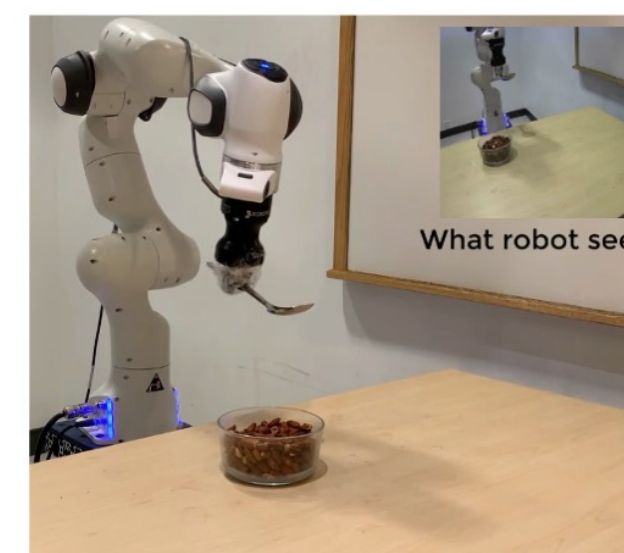
Overview: Robotic assistance with activities of daily living could increase the independence of people with disabilities and improve quality of life. While progress has been made towards such robotic-assistance, current systems rely on simplifying assumptions limiting their applicability. This project seeks to make foundational progress on developing assistive robots.

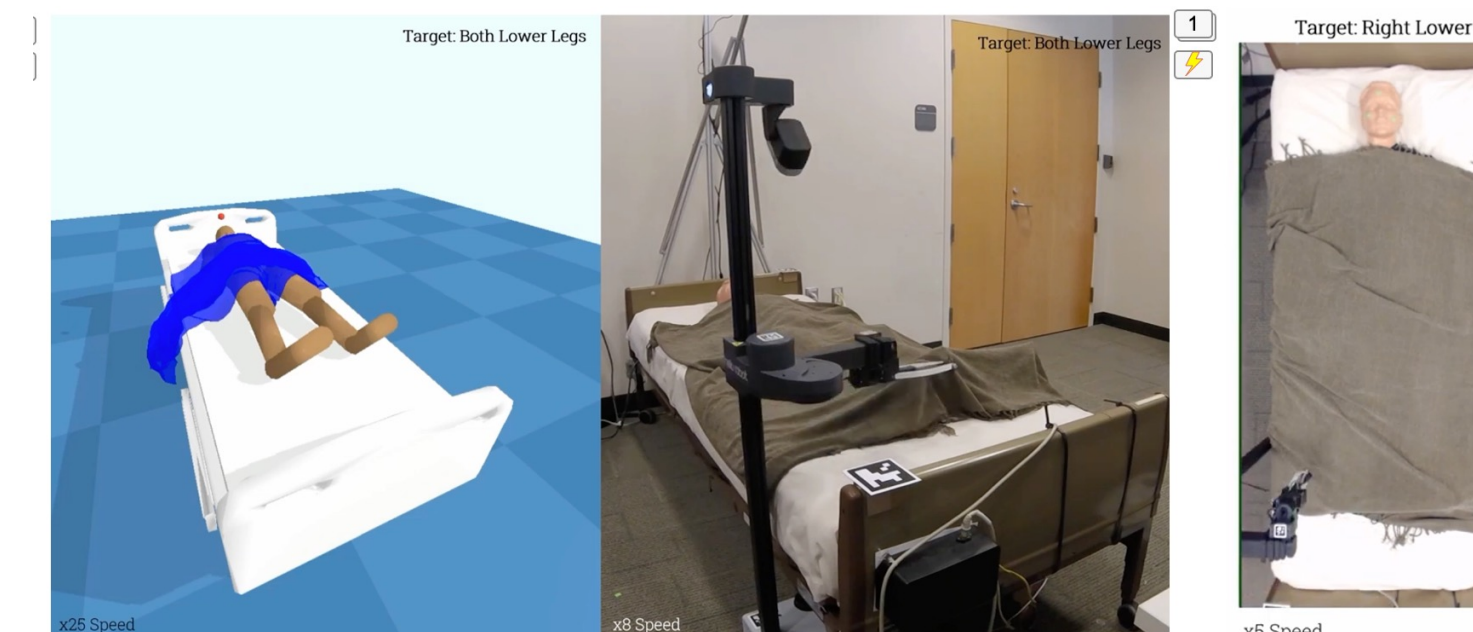- **Key challenges:** Many activities of daily living require robots to manipulate fabric in coordination with people

- **Scientific impact:** The results from this project will be open-sourced and help toward making robots for human a reality
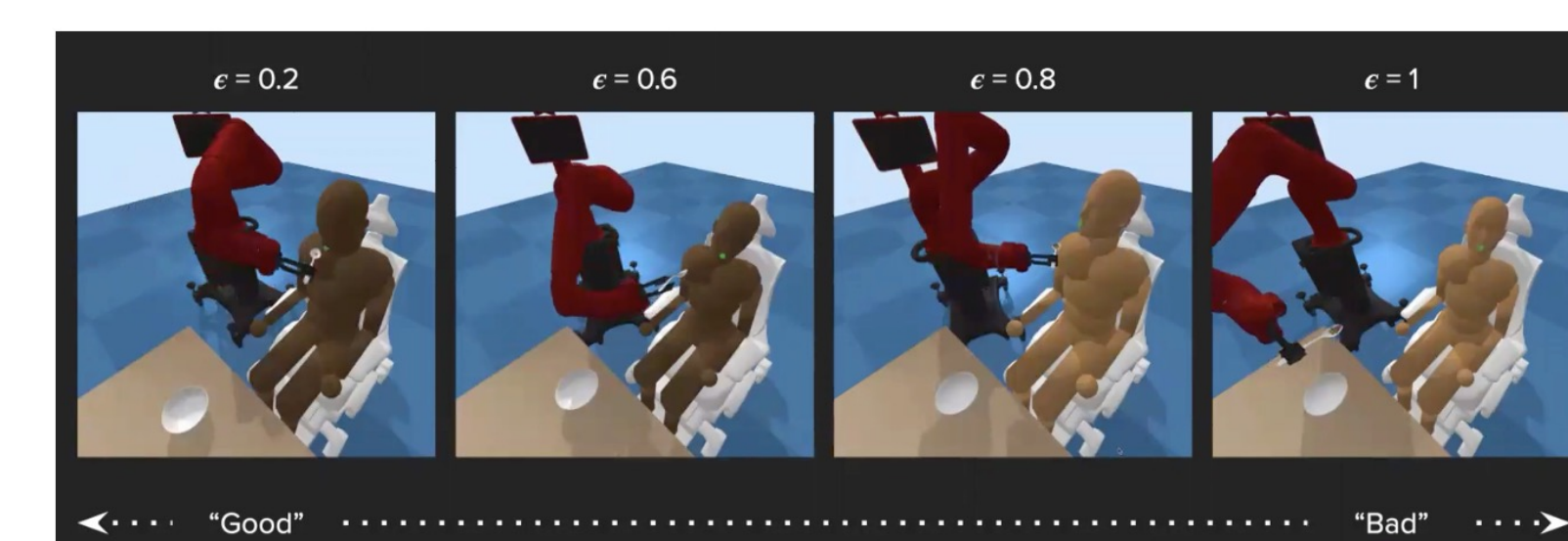
- **Progress on Obj 1:** a) Neural Dynamic Policies for dynamic tasks from pixels. b) Decision Transformers and RAPS for efficient RL

- **Progress on Obj 2:** Incorporating SMPL meshes in Assistive Gym and Sim2Real transfer for bedding manipulation.

- **Progress on Obj 3:** Reward learning from human preferences

Project Overview

Scooping

Bedding Manipulation

Preference variations in Feeding

- **Impact on society**

  - Assistive robots (e.g. dressing and body bathing) for people with disabilities, which has the potential to help millions of people achieve greater independence and a higher quality of life

- **Impact on education**

  - Assistive Gym will be incorporated into the PI's courses on Robotics and RL

  - Students will interactively learn how robots can provide physical assistance to people with disabilities

- **Potential impact**

  - Reduce financial challenges associated with professional caregivers, relieve the burden on informal caregivers, and empower older adults and people with disabilities to live more independently