

Intent Expressive Robot Pointing Robot



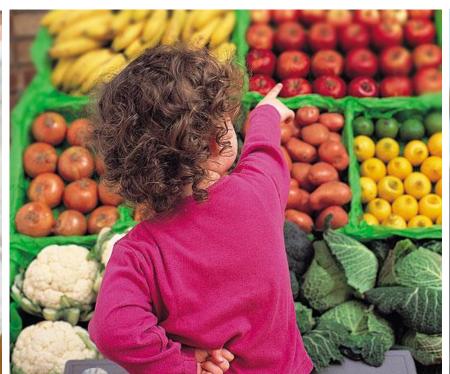
Rachel Holladay and Siddhartha Srinivasa Personal Robotics Lab, Robotics Institute, CMU

Semiconductor Research Corporation

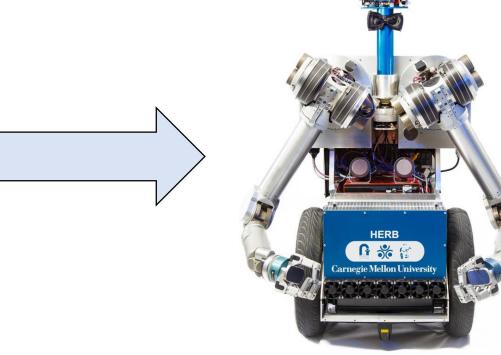
Nonverbal Communication Modality



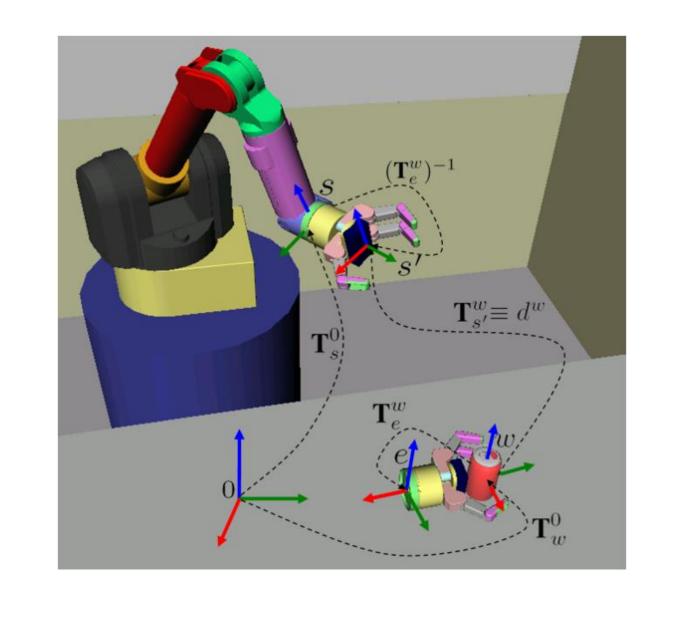




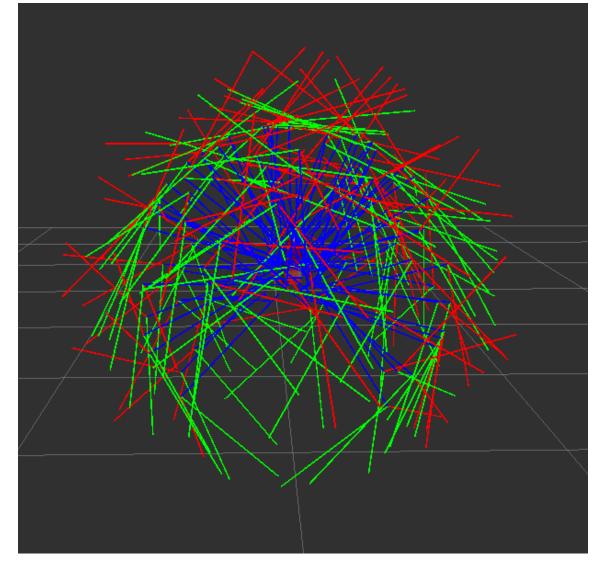




Task Space Regions

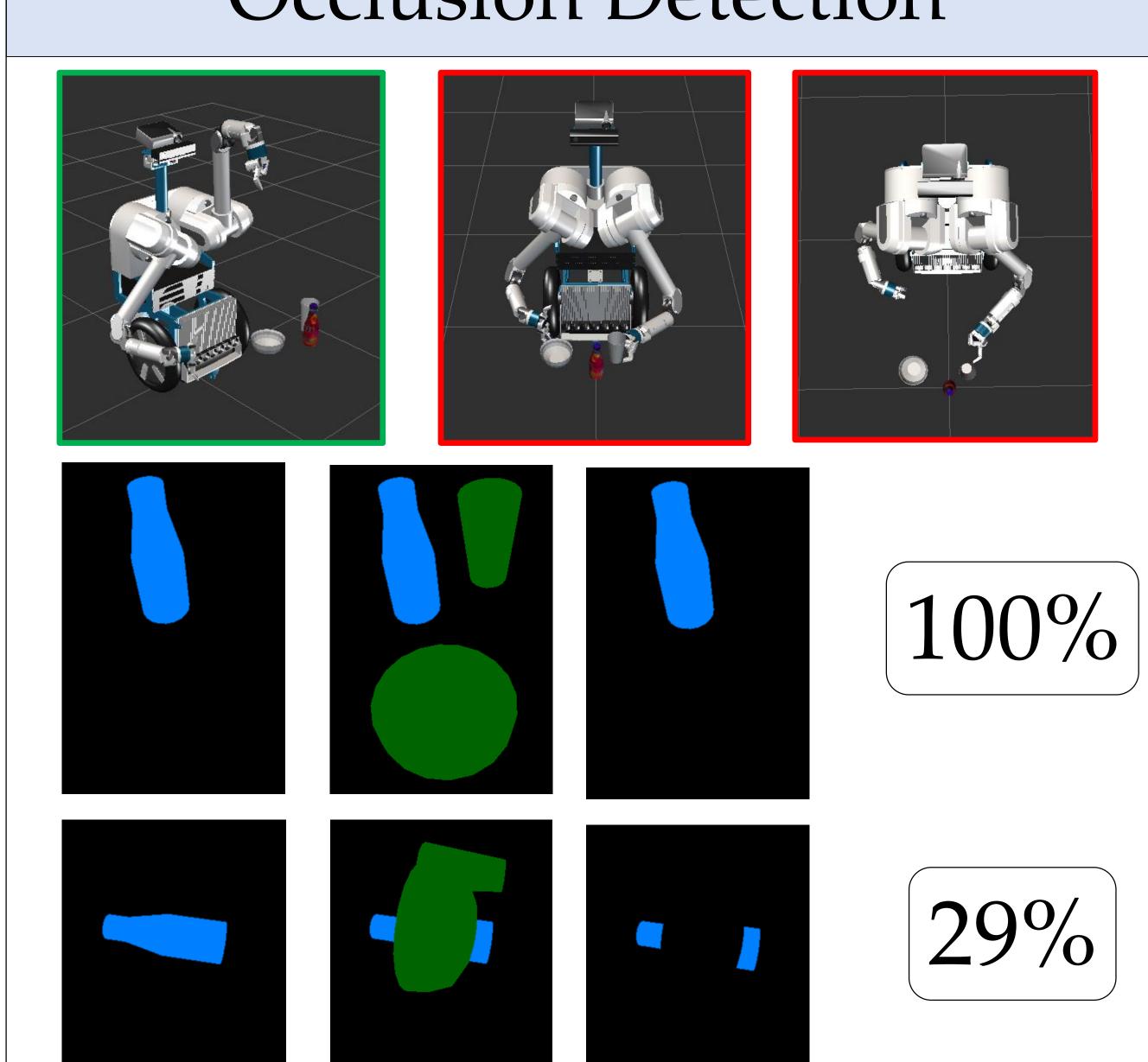


$$m{B}^{w} = egin{bmatrix} x_{min} & x_{max} \ y_{min} & y_{max} \ z_{min} & z_{max} \ \psi_{min} & \psi_{max} \ \theta_{min} & \theta_{max} \ \phi_{min} & \phi_{max} \end{bmatrix}$$

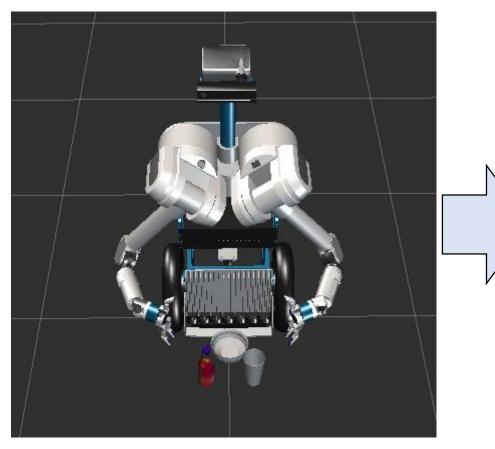


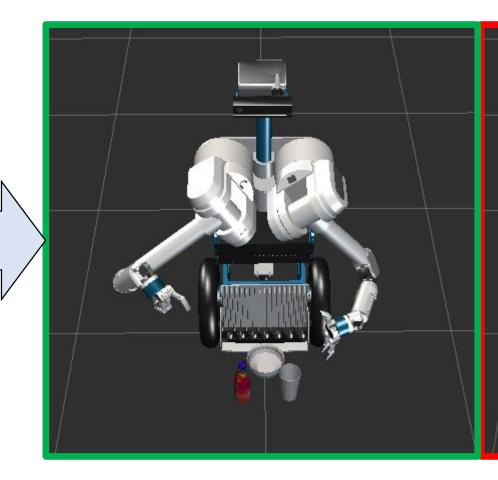
$$\begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ -\pi & \pi \\ 0 & \pi \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ -.75 & 1 \\ 0 & 0 \\ 0 & 0 \\ 0 \end{bmatrix}$$

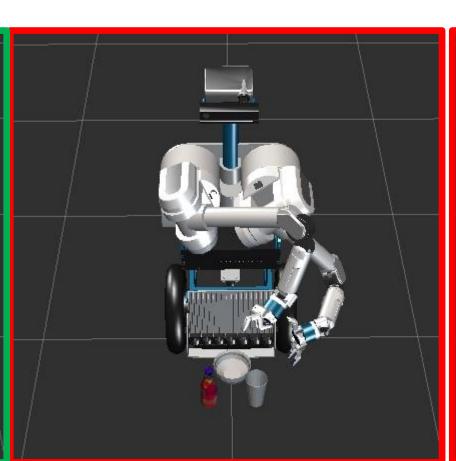
Occlusion Detection

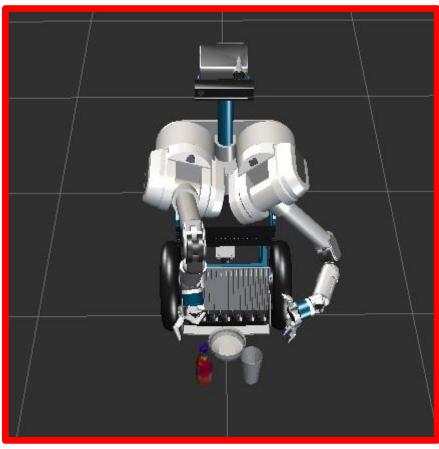


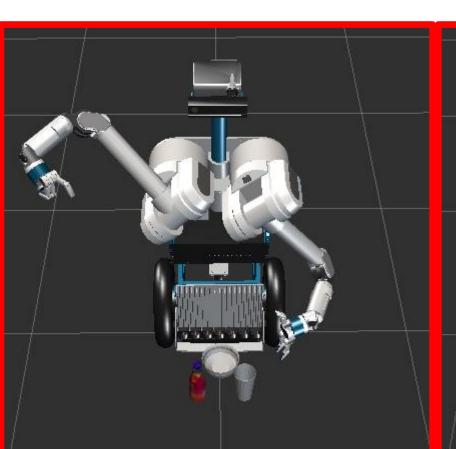
Naturalness and Intent Expressiveness

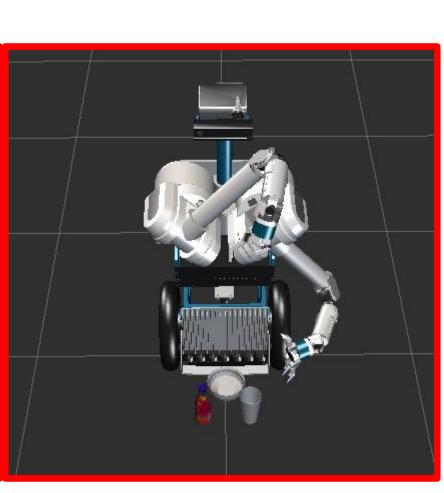












Comparison Based Active Learning

