

# Less Is More: Minimal Visual Design in Robots for Effective Social Interaction

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## Key Contributions

- **Minimal visual design** can support social interactions **as effective as** a visually complex robot
- **Physical Platform Biskee** that supports affordable, scalable HRI research

## Motivation & Platform

- Visually complex humanoid robots are costly, fragile, and hard to scale
- High realism can trigger uncanny-valley effects
- Educational and research deployments require robustness

## Our Solution: Biskee Robot

- Minimal head-only embodiment
- Animated eyes and 2-DoF expressive ears
- Coordinated visual, auditory, haptic, and motion cues
- Low-cost, open-source, ROS 2 compatible



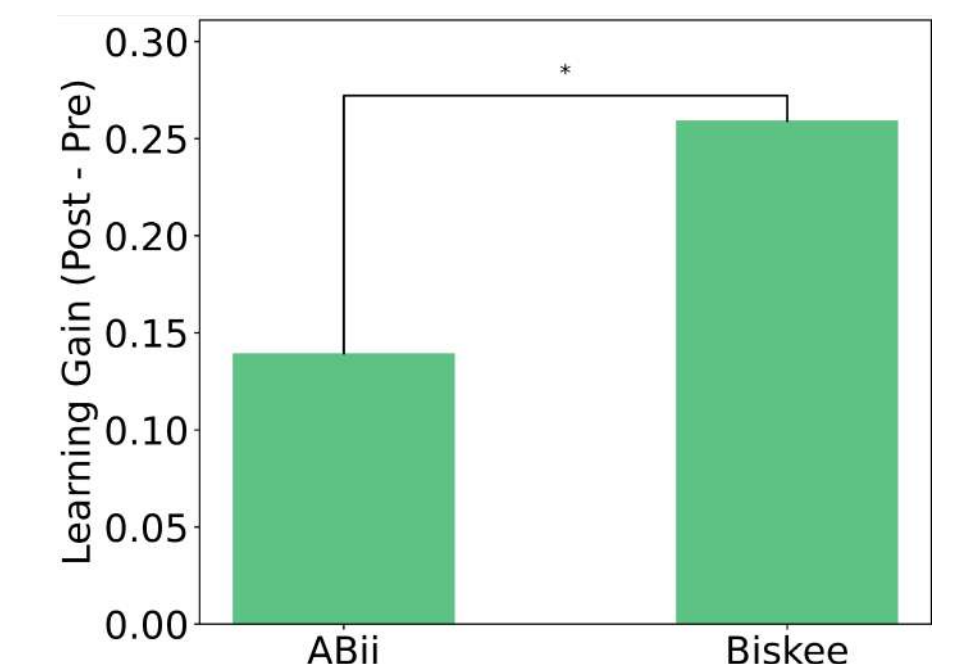
## Evaluations

### Study 1: Visual-Only Perception

- Muted videos of Biskee and a humanoid robot
- Humanoid perceived as more complex and agentic
- Biskee rated significantly less creepy

### Study 2: Embodied Interaction

- Within-subjects tutoring task
- Comparable learning gains across robots
- Post-interaction, Biskee perceived as more anthropomorphic



### Study 3: Ablation Test

- Individual expressive cues systematically disabled
- Removing any cue reduced emotion recognition accuracy
- Confirms minimal, non-redundant design