Pilot Observations of an Autonomous Red Light, Green Light Robot for Interactions with Children with Disabilities

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Paper Link

Background:

- Children with disabilities are not getting as much exercise as their peers with typical development.
- Assistive robotics are one method for promoting physical activity for children with disabilities.
- Past work shows that robots can encourage child movement without direct physical assistance.

Our Assistive Robot:

- We built GoBot on a TurtleBot2 base with custom reward hardware.
- GoBot turns, flashes light colors, and speaks a phrase for each game state.
- We added a trick state which could repeat the red light.

Bubbles
Lights
Sounds
Eyes
Button
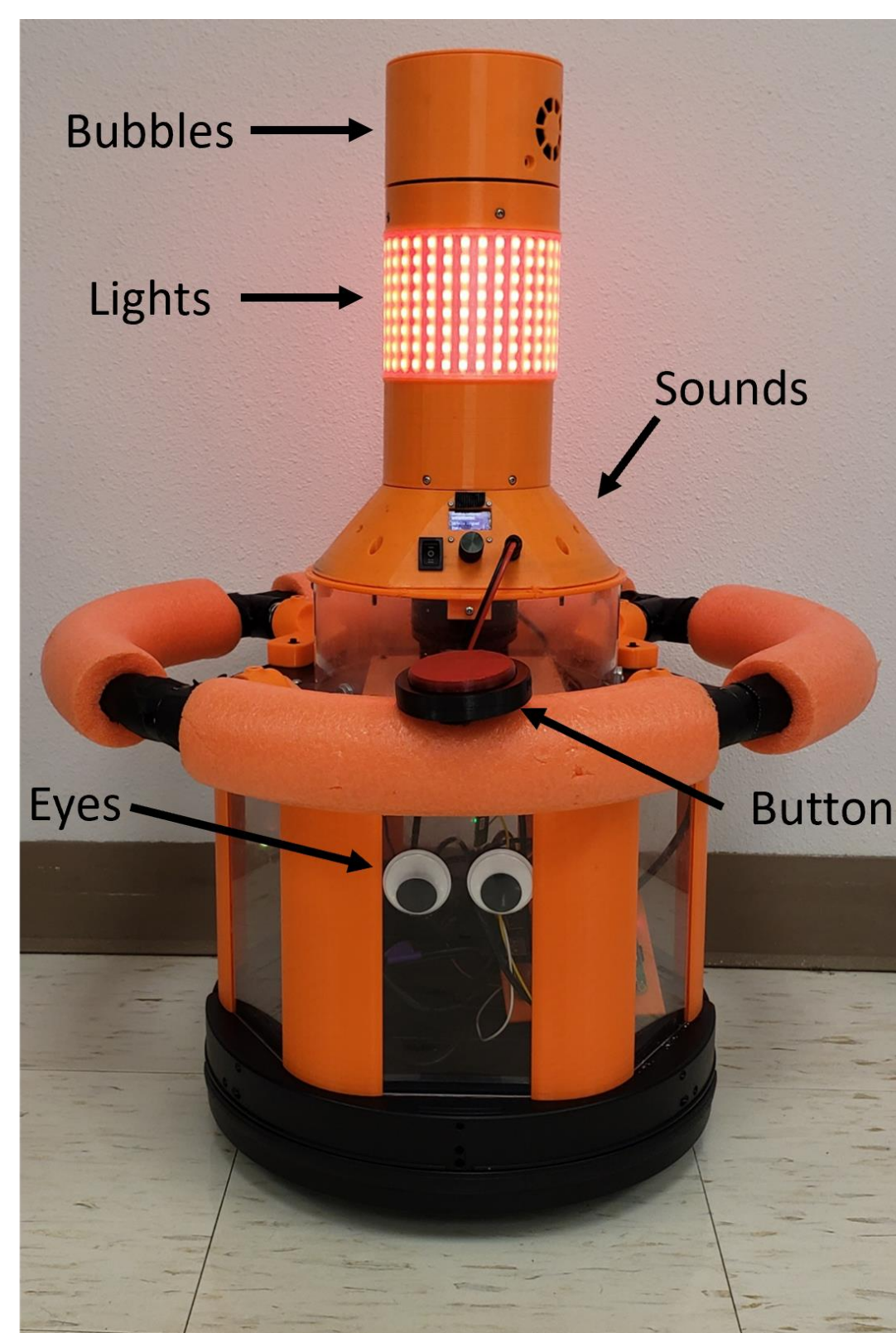
Experimental Setting:

- We joined sessions of IMPACT, a motor skills fitness program for children with disabilities.
- We interacted with 2 groups (tots and kids) across 4 sessions.
- We played the game 5 times per session.
- A researcher recorded field notes.

Key Insight: Assistive robots with games such as Red Light, Green Light can engage children with disabilities in physical activity.

Game Progression:

1 **Green Light** GO
Green Light

2 **Red Light**
Red Light

3 **Game Win!**
Yay!

Observations:

- Both groups learned the game rules within the first session.
- Both groups reached the robot very quickly.
- Facilitators introduced variations (crab walk, army crawl) to encourage different types of physical activity.
- Both groups were reluctant to let the robot leave the sessions.
- The trick red light surprised some children the first time, leading to them being more careful.
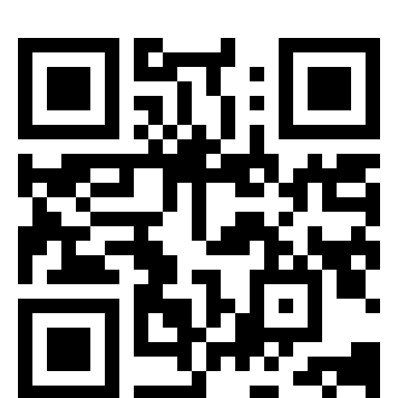
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