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Central Research Question

How do we enable a mobile assistive robot to encourage children with motor disabilities to practice motor (and other developmental) skills?

Motivation

- 7% of children experience developmental disabilities
- Interventions often delayed until post-infancy
- Robot-mediated interventions are a solution

Key Problems to Address

- Design of a robot with engaging rewards
- State tracking during infant-robot interaction
- Automatic behavior tree generation to maximize motion

Broader Impacts

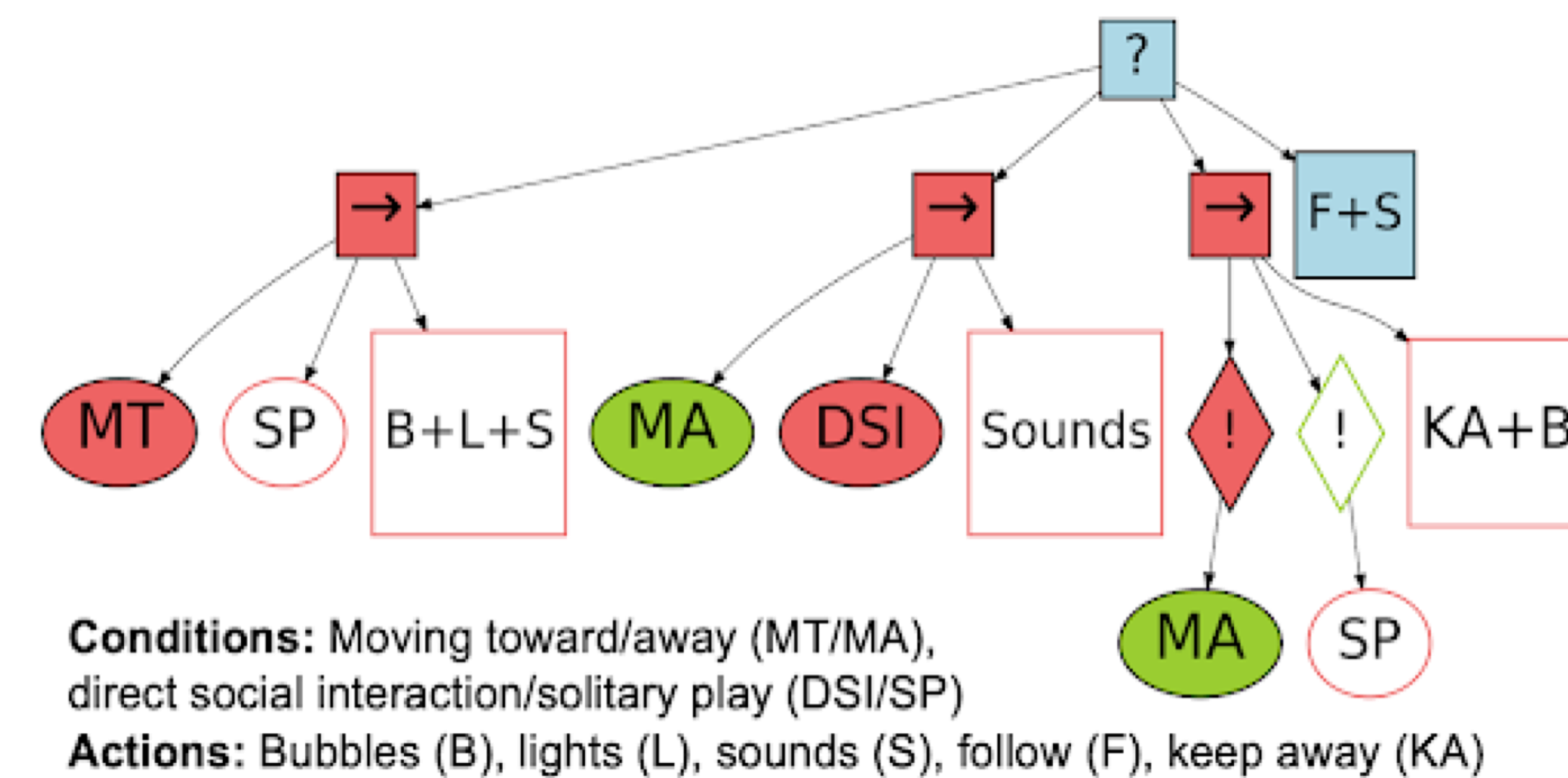
- Hosted multiple REU students
- Mentored undergrad capstone projects
- Educated clinicians about robotics at the Child Development and Rehabilitation Center



GoBot Bubbles & GoBot Throw



Overhead camera sensing system during operation



Synthesized behavior tree for autonomous child-robot interaction



GoBot interacting with child with motor disability

Robot Design Details

- GoBot's modular design ensures different rewards and stimuli can be used
- Ongoing longitudinal study with children with motor disabilities

Learning (State-Tracking) Details

- Current practices for tracking relevant states are for adults or require fiducial markers
- We created an overhead sensing system for real-time autonomous robot use

Planning (Behavior Tree) Details

- Manual tree generation is time-intensive
- We automatically generated a synthesized behavior tree which performed as well as a manual tree