Polonius

A Wizard of Oz Interface for HRI Experiments

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Abstract

Polonius is a robot control interface designed for running Wizard of Oz style experiments. It is designed to be easy enough to be used by non-programmer collaborators of roboticists. The program acts as an intermediary between the robot and a wizard interacting with a GUI based on a pre-defined script. Polonius also eliminates the need for coding the video after experiments by integrating a robust logging system.
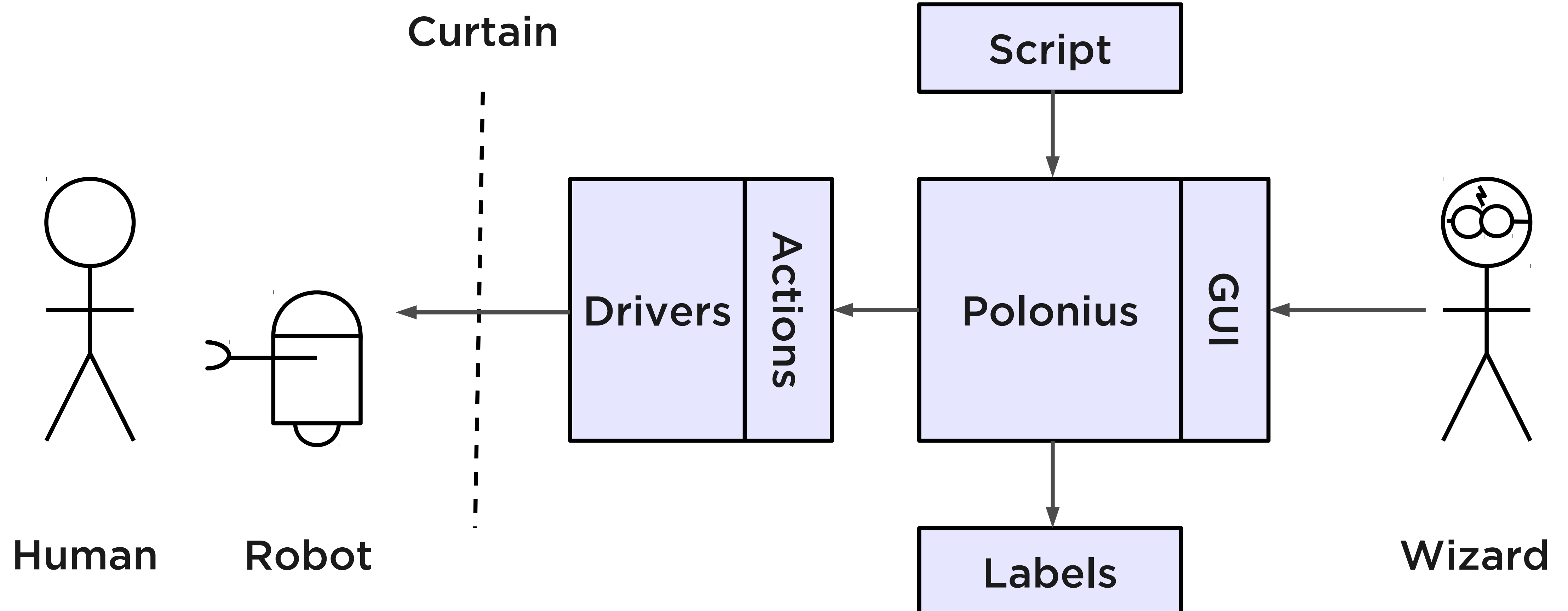
How it works

Polonius leverages two packages in ROS (http://ros.org), the robot control framework developed by Willow Garage. First, a set of atomic actions for a given robot are specified, using the `actionlib` library. Then those actions can be sequenced in a text-file script, which is used to create a finite state machine using the `smach` library. Through the course of the interaction, the human can control different elements by clicking on the buttons in a GUI (right). Also, through the interface they can label the human's actions as a way of recording the interaction for later analysis.

Example Script

```
child: {start: Child starts gesture, label: Child Gesture,
        end: {Gesture A: doA, Gesture B: doB,
              Gesture C: doC, Finish: wave}}
doA: {start: 2, label: Gesture A, action: Pose(0), end: child}
doB: {start: 2, label: Gesture B, action: Pose(1), end: child}
doC: {start: 2, label: Gesture C, action: Pose(2), end: child}
wave: {label: Wave Goodbye, action: Wave() }
```

Source code http://www.ros.org/wiki/polonius
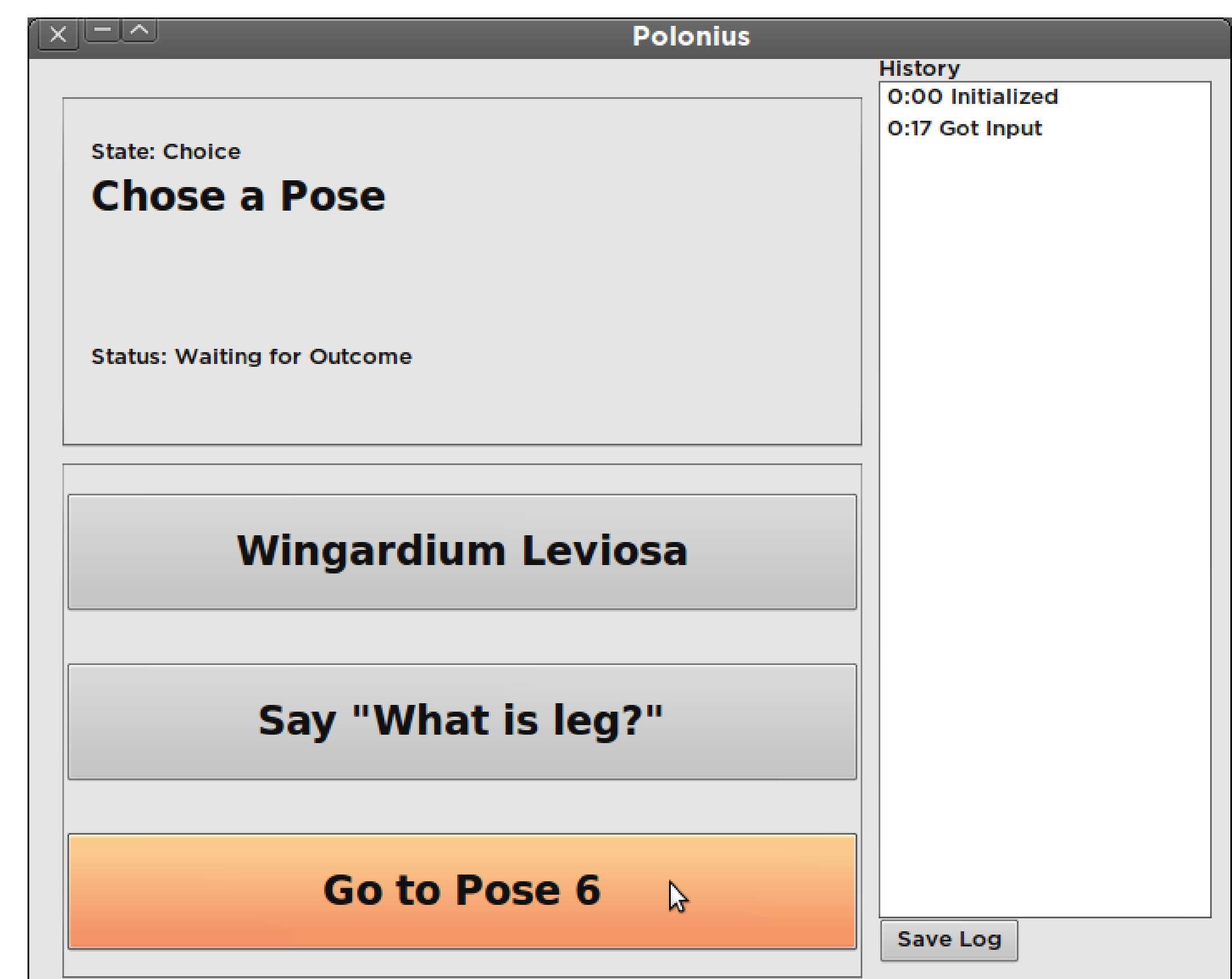
Use Scenarios

Polonius can be used to control the actions of robots in user studies while simultaneously keeping a second-to-second account of the interactions. It can also be used for controlling robots in other scripted domains like the growing field of robotic theatre, as we did in a recent performance at a colloquium at Washington University.

Polonius is named for the wise character who hides "behind the curtain" in Act V of Hamlet.