Cyber Security of Social Robots and the Internet of Things

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Purpose

The purpose of this research is to take the first steps in securing social robots against malicious activity.

Definitions

- Social Robots – Robots designed specifically to interact with humans and other social robots
- Internet of Things (IoT) – Devices that collect data and are accessible through the internet

The Research Environment

- JD-Humanoid Robot
  - Made by EZ-Robot
- Raspberry Pi Zero W
- EZO Conductivity Circuit
- All of these devices are connected to each other through the cloud via Ubidots

Results

- Backup and retrieval to/from the cloud has option for HTTPS (encrypted) protocol
- Login to Raspberry Pi requires username and password
- Discovered security vulnerabilities related to the social robot
- Established connection allows for extensive options
  - Uses Telnet (unencrypted) with no password
  - The programs run on the windows computer and send commands to the robot
  - We strongly support the addition of an authentication mechanism implemented on the robot controller

Most Important References


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