RFID Exhibit for Children's Museum

Overview

The task laid before us was to create an exhibit for the Discover Space children's museum, showcasing RFID in a way that helps kids intuitively understand the technology. The challenges within this task were to creatively show the function of RFID, while keeping the exhibit fun and engaging for the audience. To do this we created a ball drop game using three motor-controlled gates, each controlled by a reader and accompanied by an LED. At each stage of the game, the LEDs light up, prompting a player to scan the properly labeled color.

Objective

- Create a fun, informative, exhibit showcasing RFID technology to young children

Approach

- Brainstormed ways to make an exhibit to use RFID in a fun, non-trivial way
- Came up with other ideas such as timed toy cars racing around a track, using RFID tags to associate with clothing in a digital dress-up game, associating tags with instruments to make songs
- Visited Discovery Space to speak with the volunteers, brainstorm, share our ideas, and help refine our thoughts
- Decided on the ball drop game described above
- Began researching usages of RFID readers in other projects
- Used a breadboard to test RFID readers, LEDs, and Servo Motors
- Programmed the logic for the game using Arduino IDE and MFRC522 RFID reader library
- Construct a physical tower and housing out of durable wood and acrylic plastic
- Soldered metal connections into the pin ports on all readers
- Soldered jumper wires to the connections on readers, LED lights, and Servo Motors
- Attached electrical components to the exhibit
- Soldered the wires for any connections sharing a port on the Arduino together with one another, into one outgoing port for the Arduino

Outcomes

- Our exhibit, a ball drop game with three gates worked. At each gate the LED will light up with 2 random colors in a row, waiting for the correct card to be scanned. The game can also be restarted repeatedly.
- The sponsor was pleased, saying it was his most successful capstone yet, and the Discovery Space will hopefully place our exhibit on display in order to help kids learn.