

What will it do?

The project will consist of a user-controlled amusement park containing the following rides:

- Roller coaster
- Drop Tower
- Ferris Wheel
- Chair Swing Ride

The user will be able to start and stop the various rides, view total fares calculated on a screen, and generate a video of their experience. To begin, the amusement park will be controlled through a console interface on a laptop.

However, if extra time remains, each individual action will be triggered through gestures recognized by a Myo device instead.

Software Components:

- Control motors through user and sensor input
 - *The majority of the program will reflect challenges associated with this task*
 - Implement e-paper screen to calculate fares
 - Connecting smartphone and camera to user input
 - Sharing smartphone footage to social media
 - (Integrating Arduino and Myo)
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Prototype Plan:

Software: The prototyping process will begin with experimental programming for separate components (rides, controller, etc.), and then combine these parts into a full prototype that works together. Once the prototype has been thoroughly tested and is completely functional, the process will become evolutionary. In this phase, the prototype will be improved and retested after discovering ways to make the final product more efficient or more interesting. For example, an evolutionary improvement could be collecting user input through Myo.

Hardware: Similarly, since this project will be heavily hardware-based, the prototyping process for the hardware will begin with experimental prototyping to learn about the basic hardware setup. Eventually, the project will integrate components and make improvements through evolutionary prototyping. These evolutionary improvements may include incorporating LED lights, sounds, and other aesthetic changes.

Overall, the prototype will begin growing horizontally, expanding different parts of the park on a shallower level to create the base prototype, and then using vertical prototyping strategies to create more efficient and realistic rides and park operations.

Hardware:

Necessary hardware components:

- Arduino (Control the hardware components)
- Motors (To move the various components)
- Smartphone (To generate and share the generated recording)
- Screen (To output fares)
- Laptop (For user input through a console)
- Sensors (ex. Distance sensors)
- Supplementary electrical components such as resistors, transistors, etc.

Optional hardware components:

- Myo (For user input through gesture recognition)
 - LEDs (Aesthetics)
 - Speaker (To play music)
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Challenges:

Some major challenges to this project will be programming each separate hardware component to run simultaneously and smoothly, since there are many different components. Additionally, it will be difficult to keep this project simple and user-friendly to control with so many components. Furthermore, it may become complicated to ensure that the user input is properly communicated and implemented with so many possible commands. This will be even more challenging if the Myo is incorporated. Other possible challenges may arise in properly calculating the fares if the rides run simultaneously and also in generating and sharing the roller coaster footage from the smartphone.