Planning

Timeline: Production Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Step | Process | Tools/equip/materials | Safety | Time |
|  | **Circuit Creation** | | | |
| 1 | Gather electrical components and laser cut base | Plastic base, Arduino Uno, Ultrasonic Sensor, RGB Sensor, L298N, DC Motor x2, Printed Circuit Board (PCB), Secondary Power Supply, Button x3, RGB LED, Buzzer, Resistors |  |  |
| 2 | Place main electrical components in their corresponding slot | Arduino Uno, Ultrasonic Sensor, RGB Sensor, L298N, DC Motor x2, Printed Circuit Board (PCB), Secondary Power Supply, AA Battery Pack | Do not force components | 20 mins |
| 3 | Lock in electrical components with screws | 3D Printed (non-threaded) Screws or metal (threaded) screws |
| 4 | Connect main components together with jumper wires and printed circuit board (PCB) as the central hub | Jumper wires, Main Electrical Components, Printed Circuit Board (PCB) | Make sure wires are not tangled | 20 mins |
| 5 | Connect secondary components to main components with jumper wires | Jumper wires, Button x3, RGB LED, Buzzer, Resistors |
| 6 | Plug Arduino Uno into computer and install test script | USB 2.0 Printer Cable, Arduino System, Computer, Arduino IDE Script |  | 10 mins |
| 7 | Run Cicuito.io test script | Arduino system |  |
| 8 | Solder all wires to their respective slot in the Printed Circuit Board (PCB) | Printed Circuit Board (PCB), Electrical Components, Jumper Wires, Soldering Iron, Solder Wire, Sponge | Safety glasses | 30 mins |
| 9 | Run Cicuito.io test script | Arduino system |  | 10 – 20 mins |
| 10 | Locate and fix any errors if script does not run | Multimeter, Soldering Iron, Solder Wire, Sponge | Safety glasses |
| 11 | Plug Arduino Uno into computer and install runtime script | USB 2.0 Printer Cable, Arduino System, Computer, Arduino IDE Script |  |
|  | **Exterior Installation** | | | |
| 1 | Gather mechanical (exterior) components and casing | Pivot Wheel, 3D Printed Casing, 3D Printed Door, Large Wheel x2 |  |  |
| 2 | Attach wheels to DC motors | Large Wheel x2 |  | 15 mins |
| 3 | Attach pivot wheel to front of base (underside) | Pivot Wheel, 3D Printed (non-threaded) Screws or metal (threaded) screws | Do not force components. |
| 4 | Combine 3D printed parts. Slide door inside case railing | 3D Printed Casing, 3D Printed Door |
| 5 | Slide 3D printed case over the Arduino system base | 3D Printed Casing, Laser cut base with Arduino System |
| 6 | Attach electrical components to casing | 3D Printed Casing, Ultrasonic Sensor, Button x3, RGB LED | 10 mins |
|  | **Total Time** | | | 2 Hours |

Third Party Materials, Components and Processes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | Third part**y** Material | Description | Owner | Link (if applicable) |
| Software |  | | | |
|  | Arduino IDE | The compiling software which is needed to program the Arduino Uno | Arduino | <https://www.arduino.cc/en/software> |
|  | Generated Arduino IDE Script | An Arduino Uno script generated by Circuito.io (a circuit creation software) which assigns all correct ports and has test code to examine the status of each component | Circuito.io | <https://www.circuito.io/>  <https://www.circuito.io/> |
|  | Fusion 360 | The software used to create the non-electronic components of the project (laser cut base and 3D printed shell) | Autodesk | <https://www.autodesk.com.au/products/fusion-360>  <https://www.autodesk.com.au/products/fusion-360> |
| 3D Models |  | | | |
|  | Arduino Uno | A 3D model of the Arduino Uno with real world dimensions | Andrew Whitham | <https://grabcad.com/library/arduino-uno-r3-1>  <https://grabcad.com/library/arduino-uno-r3-1> |
|  | Ultrasonic sensor (HC-SR04) | A 3D model of the HC-SR04 with real world dimensions | Dejan | <https://thangs.com/designer/HowToMechatronics/3d-model/HC-SR04%20Ultrasonic%20Sensor%203D%20Model-48028> |
|  | DC Board (L298N) | A 3D model of the L298N with real world dimensions | Tijani Jouini | <https://grabcad.com/library/l298n-17> |
|  | DC Motor | A 3D model of the DC Motor with real world dimensions | Moustafa Nabil | <https://grabcad.com/library/mini-gear-dc-motor-6-v-yellow-1> |
|  | Colour Sensor | A 3D model of the TCS34725 with real world dimensions | Davor Granić | <https://grabcad.com/library/tcs34725-rgb-sensor-2> |
|  | Rubber Wheel | A 3D model of the Rubber Wheels with real world dimensions | Amine Bouabid | <https://grabcad.com/library/dc-motor-with-wheel-1> |
| Machine**ry** |  |  |  |  |
|  | 3D Printer | The machine responsible for creating the shell. | Aitken College | Not Applicable |
|  | Laser cutter | The machine which is responsible for precisely cutting the plastic base | Aitken College | Not Applicable |
| Components |  | | | |
|  | Arduino Starter Kit | The kit which contains all electrical components to be used in the project | Arduino | Not Applicable |