**Feature list for EGR101 software tool**

* Profile setup, the ability for a student to input their information as for generating “reports” and unique files. Information to be their name, student id, student email, and class section number. The purpose is to speed up report generation for assignment submission files, while reducing user error.
  + All exported files should be named using user account information.
* Students should have the ability to digitally *wire* components to a virtual Arduino or breadboard.
  + No restrictions to wire placement/connections. Allow for errors. Example placing wires between the wrong pins – desired sensor out to A0, reality sensor out to A4- here the user should see a return of random volt values (with reasonable ranges). Or 5v high directly to input/gnd, resulting in *frying* the Arduino or circuit.
  + The output of such should be a visual response.
  + All user errors regarding wiring should be logged to a report file.
* Software should be able to take in an Arduino script and emulate the behavior.
  + Needs to be a link between user defined wiring and script.
* Students should be able to *customize* their bot. Limited.
  + Color – sensor forks, frame, wheels
  + Front sensor forks – spacing between, number of sensors, height of sensors….
  + Type of wheels – distance between encoder ticks.
  + Size of any component should be fixed. (unchangeable)
* The software should have features for color blind accessibility.
  + Changing all color aspects of the GUI
* Software should be GUI driven.
  + Ability for upload/execution of pre-configuration files. These files should contain all required information to load and execute a user defined simulation.
  + The simulation should have either a two- or three-dimensional aspect.
  + Software should be graphically compatible with different hardware platforms.
* Software should be compatible with different OS systems – MAC and Windows
* Software be a platform for constructing new simulated components, courses, and lecture materials.
  + This should give the ability for custom material as per the user’s desire. And should make development easier.
* The software should visually record during simulation execution of user defined behavior.
  + Recording should be savable
  + Output file should be re-playable using any video player.

Components to be simulated, standard with the software, are the following:

* [Infrared Proximity Sensor Long Range - Sharp GP2Y0A02YK0F - SEN-08958 - SparkFun Electronics](https://www.sparkfun.com/products/8958)
* [Infrared Proximity Sensor Short Range - Sharp GP2Y0A41SK0F - SEN-12728 - SparkFun Electronics](https://www.sparkfun.com/products/12728)
* The table below is the current build list.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Part** | **Amount** | **Price** | **Total** | **Link** |
| Parallax Continuous Rotation Servo | 2 | 17.99 | 35.98 | <https://www.parallax.com/product/900-00008> |
| 1" Tail Wheel Ball | 1 | 3.95 | 3.95 | <https://www.parallax.com/product/700-00009> |
| Battery Holder 5-AA Barrel Jack | 1 | 3.99 | 3.99 | <https://www.parallax.com/product/753-00007> |
| Robot Wheel & Molded Tire for Servos (pair) | 1 | 4.95 | 4.95 | <https://www.robotshop.com/en/pololu-wheel-pair-standard-servo-splines-25t-58-mm-70-x-8-mm-black.html> |
| SparkFun Line Sensor Breakout - QRE1113 (Analog) | 2 | 2.95 | 5.9 | <https://www.sparkfun.com/products/9453> |
| REXQualis -Arduino kit | 1 | 30.99 | 30.99 | <https://www.amazon.com/REXQualis-Development-Membrane-Receiver-Detailed/dp/B074WMHLQ4/ref=sr_1_1?ie=UTF8&qid=1535123951&sr=8-1&keywords=REXQualis+Arduino+UNO+Project+Super+Starter+Kit+for+Arduino+w%2FUNO+R3> |
|  |  |  |  |  |
|  |  | **SubTotal** | 85.76 | *Not including tax or shipping and handling* |