

The background is a vibrant, stylized space scene. It features large, flowing, organic shapes in shades of red, pink, purple, and blue. Scattered throughout are numerous small white stars and several planets. In the top right, there's a large red planet with orange and yellow patterns, and a smaller yellow and orange striped planet below it. In the bottom left, there's a yellow and orange striped planet. Other planets are depicted in various colors like purple, blue, and green, some with patterns. The overall aesthetic is modern and artistic.

EGR101 SIM

--- SPRINT 4 DEMO ---

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Project Description



- ❖ An application that allows virtual bot design with:
 - component configuration
 - wiring layout
 - 3D simulation
- ❖ Packaged with an Arduino IDE.



Project Use

- ❖ Students couldn't do hands-on due to COVID-19.
- ❖ Cheaper alternative to buying an \$85 kit.
- ❖ Fully emulates EGR101.

Assumptions/Dependencies

- ❖ Students are familiar with the kit and its components
- ❖ Students understand assigned task and what to do
- ❖ Only the professor can add additional components/pieces to the kit
- ❖ The application can run on different operating systems

Constraints

- ❖ Project is constrained by the kit provided to the EGR 101 students
- ❖ Cannot have functionality or components that the actual robot and kit does not have

Fall Semester

- ❖ Wiring Interface
- ❖ Simulation Functionality
- ❖ Most Models Completed
- ❖ Arduino Interface

Major Sub-Systems



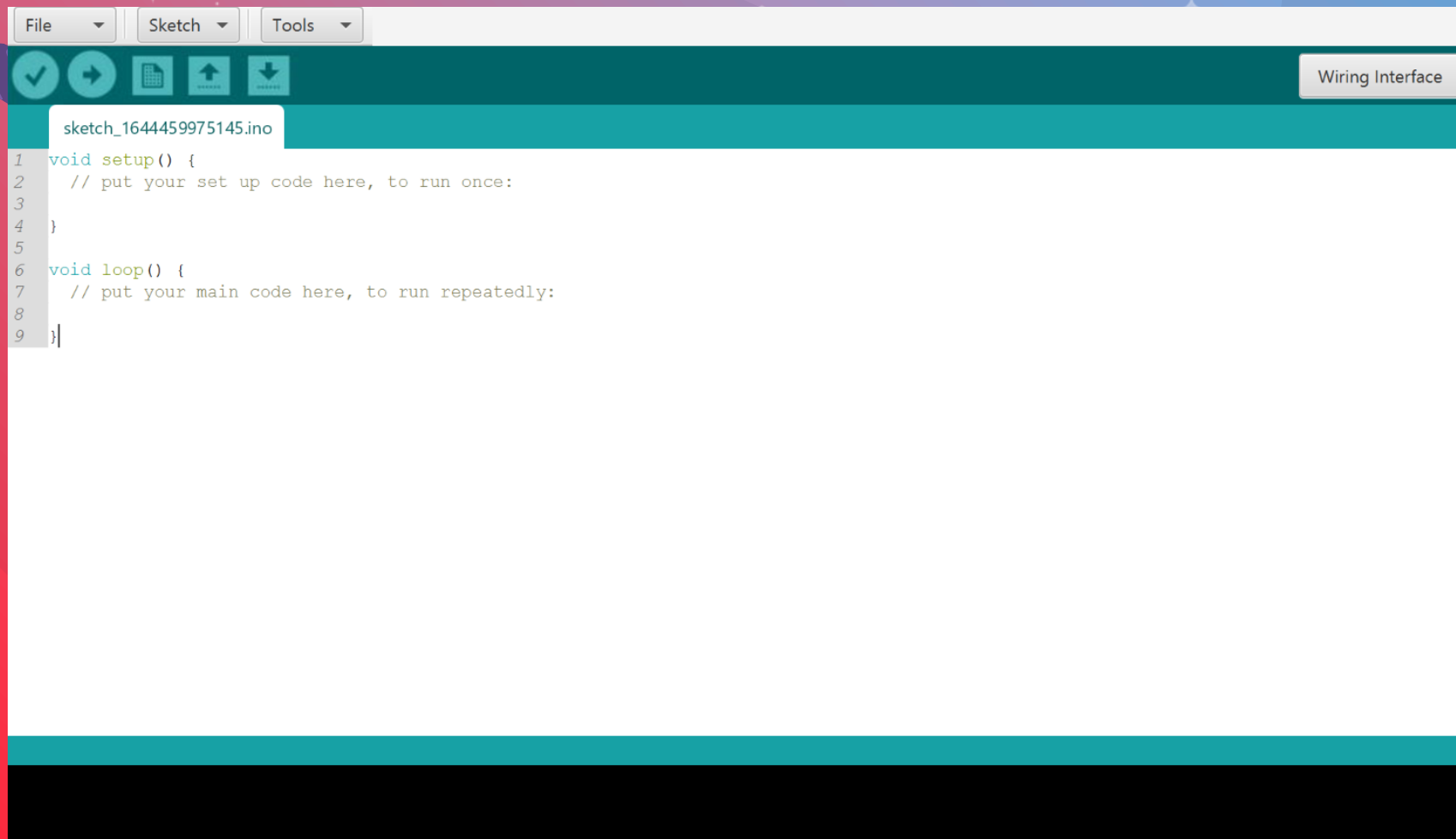
Design/Wiring
Interface



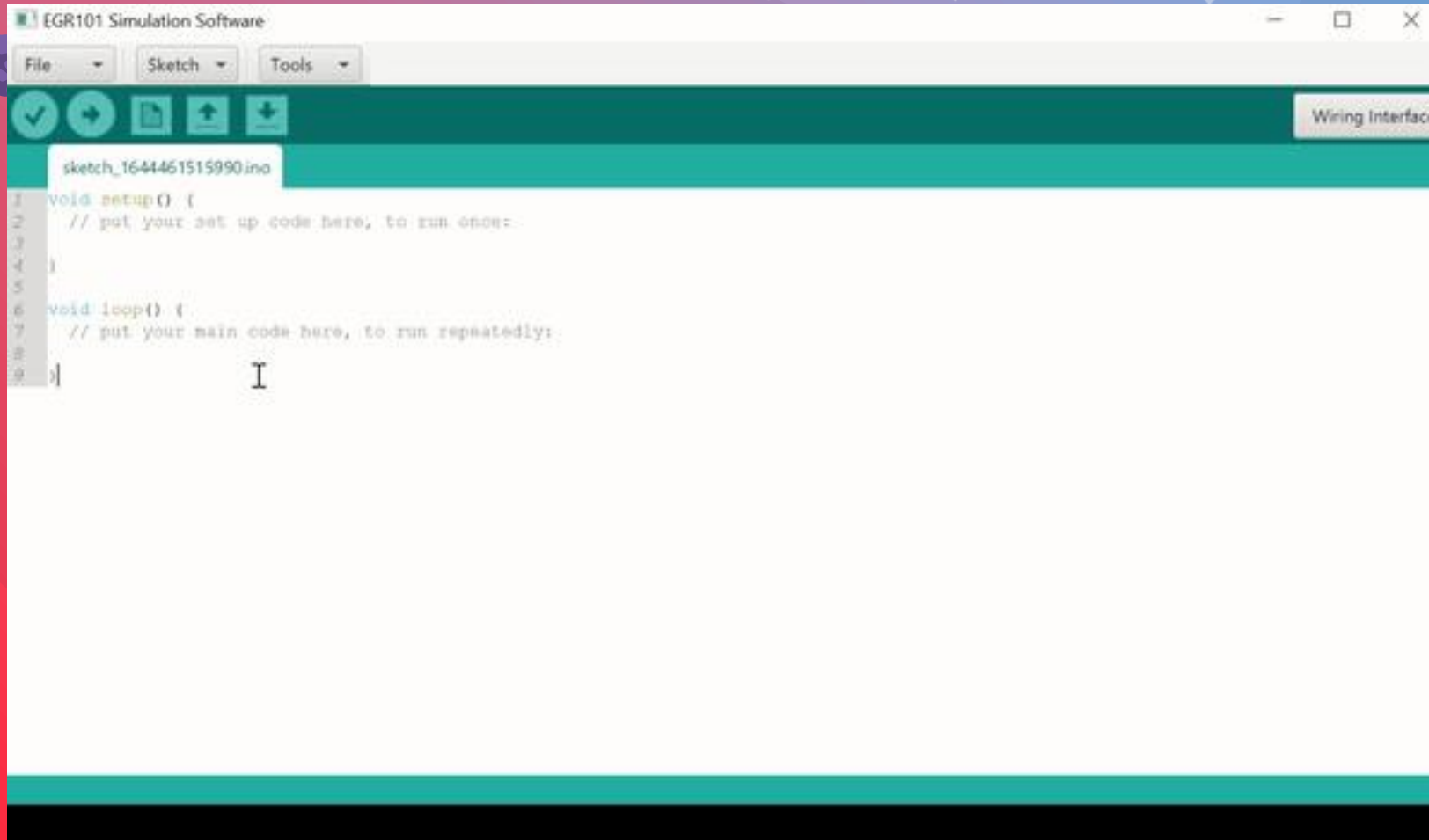
Arduino IDE



Arduino
Emulation



Arduino IDE Progress

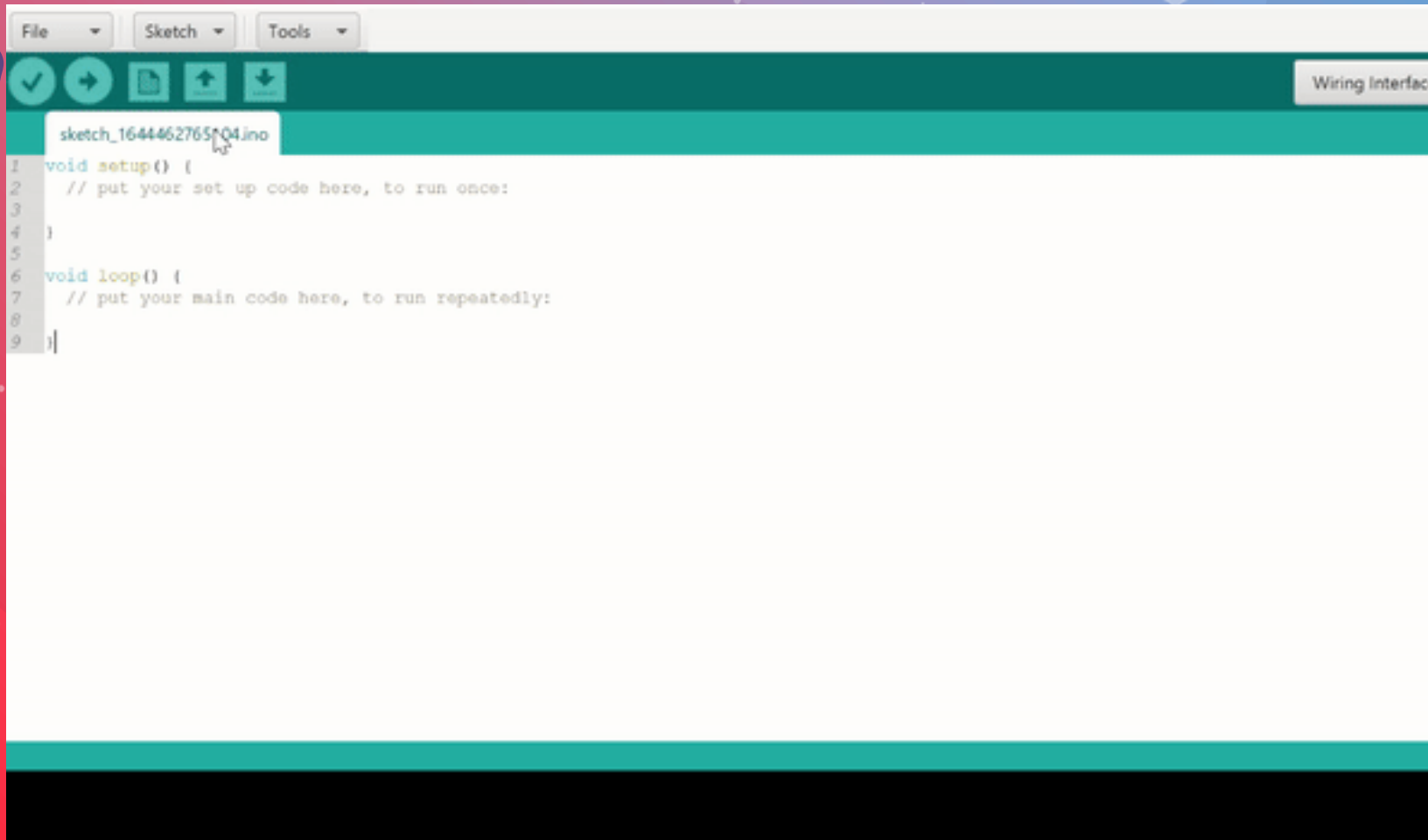


The screenshot displays the 'EGR101 Simulation Software' window. At the top, there is a menu bar with 'File', 'Sketch', and 'Tools' options. Below the menu is a toolbar with icons for checking, running, saving, and uploading. A 'Wiring Interface' button is located on the right side of the toolbar. The main area is a code editor showing a sketch named 'sketch_1644461515990.ino'. The code is as follows:

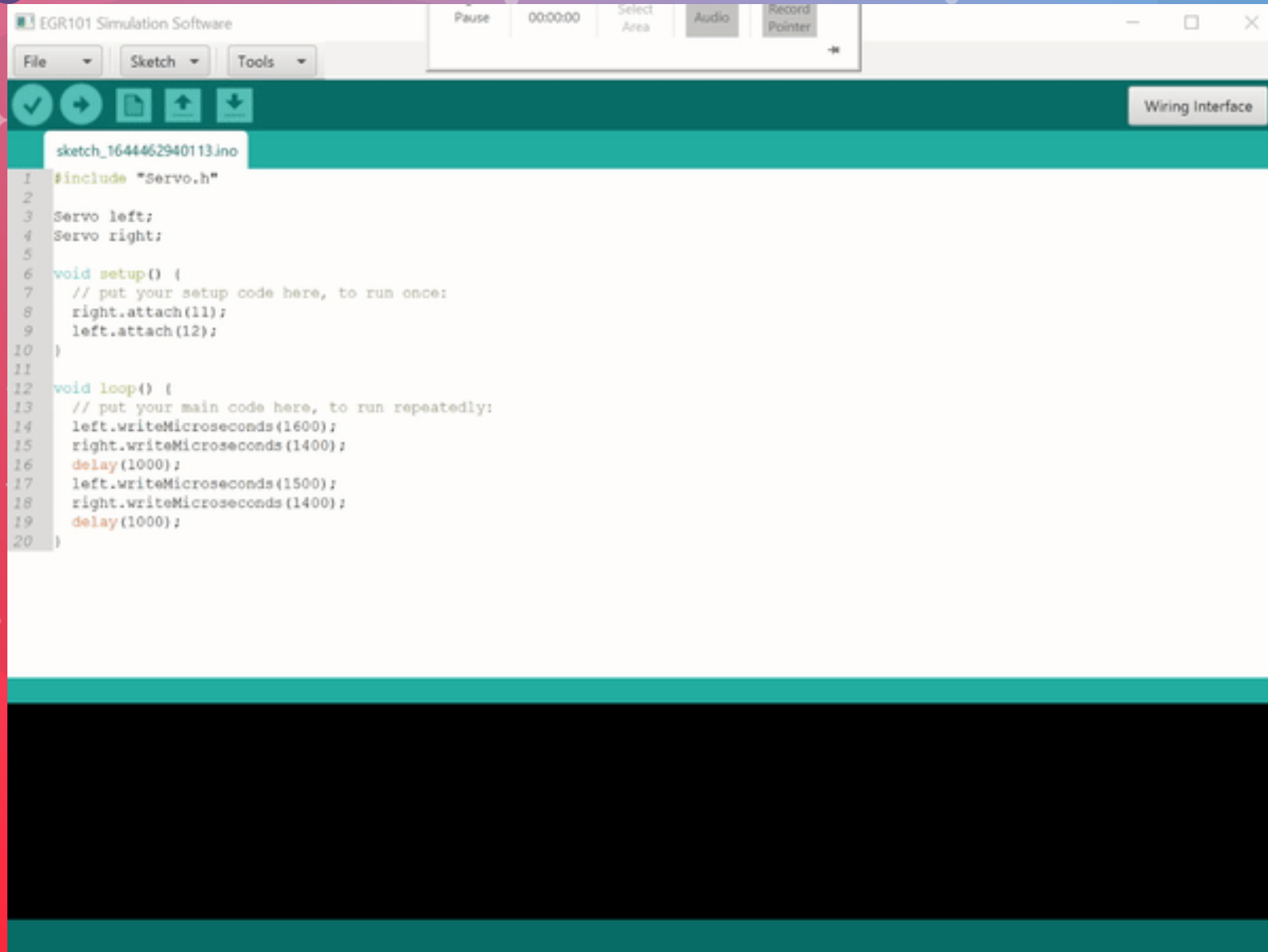
```
1 void setup() {  
2   // put your set up code here, to run once:  
3  
4 }  
5  
6 void loop() {  
7   // put your main code here, to run repeatedly:  
8  
9 }
```

The cursor is positioned at the end of line 9.

Arduino IDE Progress



Arduino IDE Progress



The screenshot displays the EGR101 Simulation Software window. The title bar reads "EGR101 Simulation Software". The menu bar includes "File", "Sketch", and "Tools". A toolbar with icons for checkmark, play, save, and download is visible. A "Wiring Interface" button is on the right. The main text area shows a sketch named "sketch_1644462940113.ino" with the following code:

```
1 #include "Servo.h"
2
3 Servo left;
4 Servo right;
5
6 void setup() {
7   // put your setup code here, to run once:
8   right.attach(11);
9   left.attach(12);
10 }
11
12 void loop() {
13   // put your main code here, to run repeatedly:
14   left.writeMicroseconds(1600);
15   right.writeMicroseconds(1400);
16   delay(1000);
17   left.writeMicroseconds(1500);
18   right.writeMicroseconds(1400);
19   delay(1000);
20 }
```

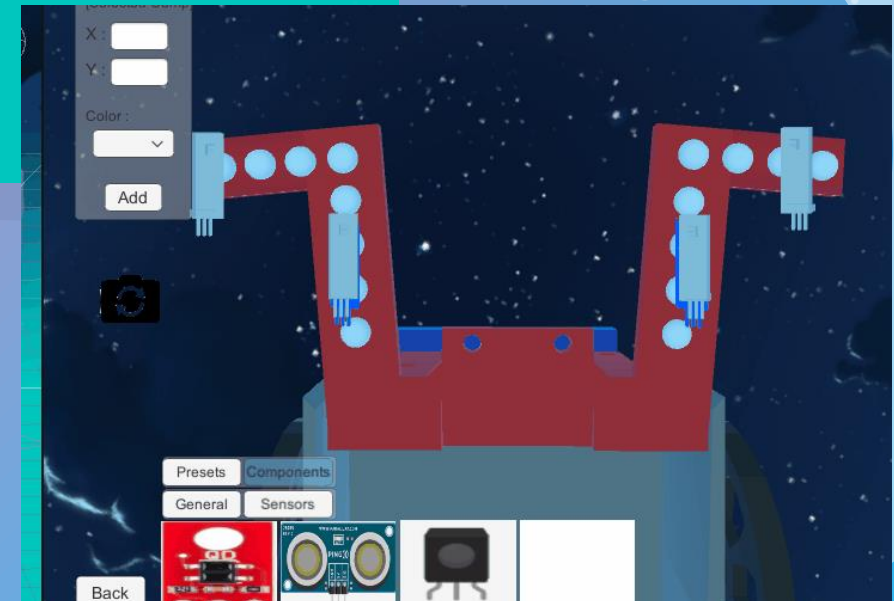
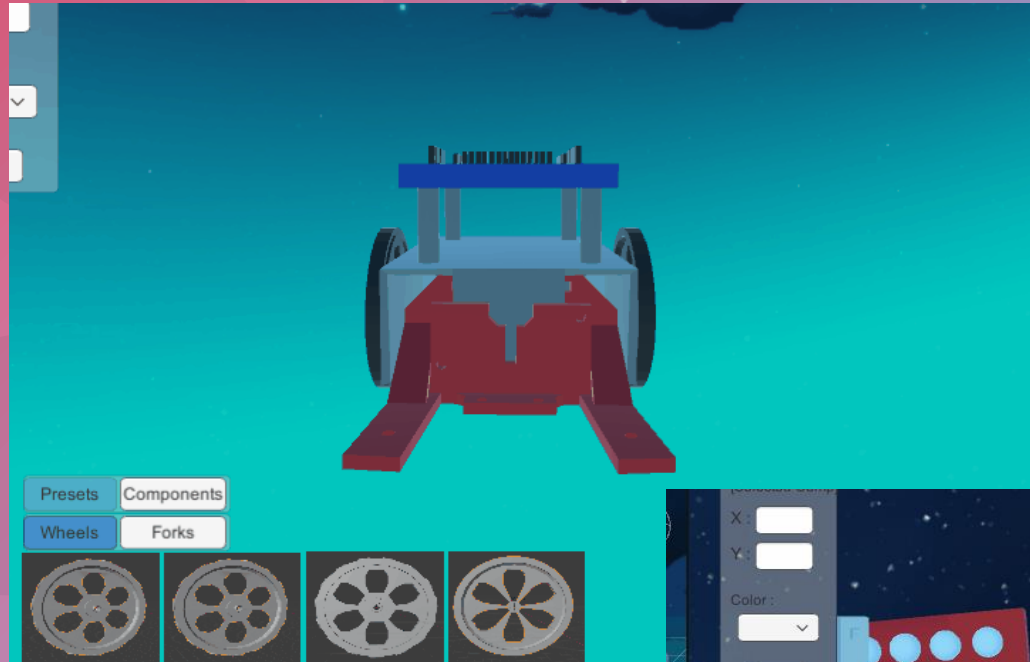
Below the code editor is a large black rectangular area, likely for a simulation or output display.

Arduino IDE Progress



Bot Customization Menu

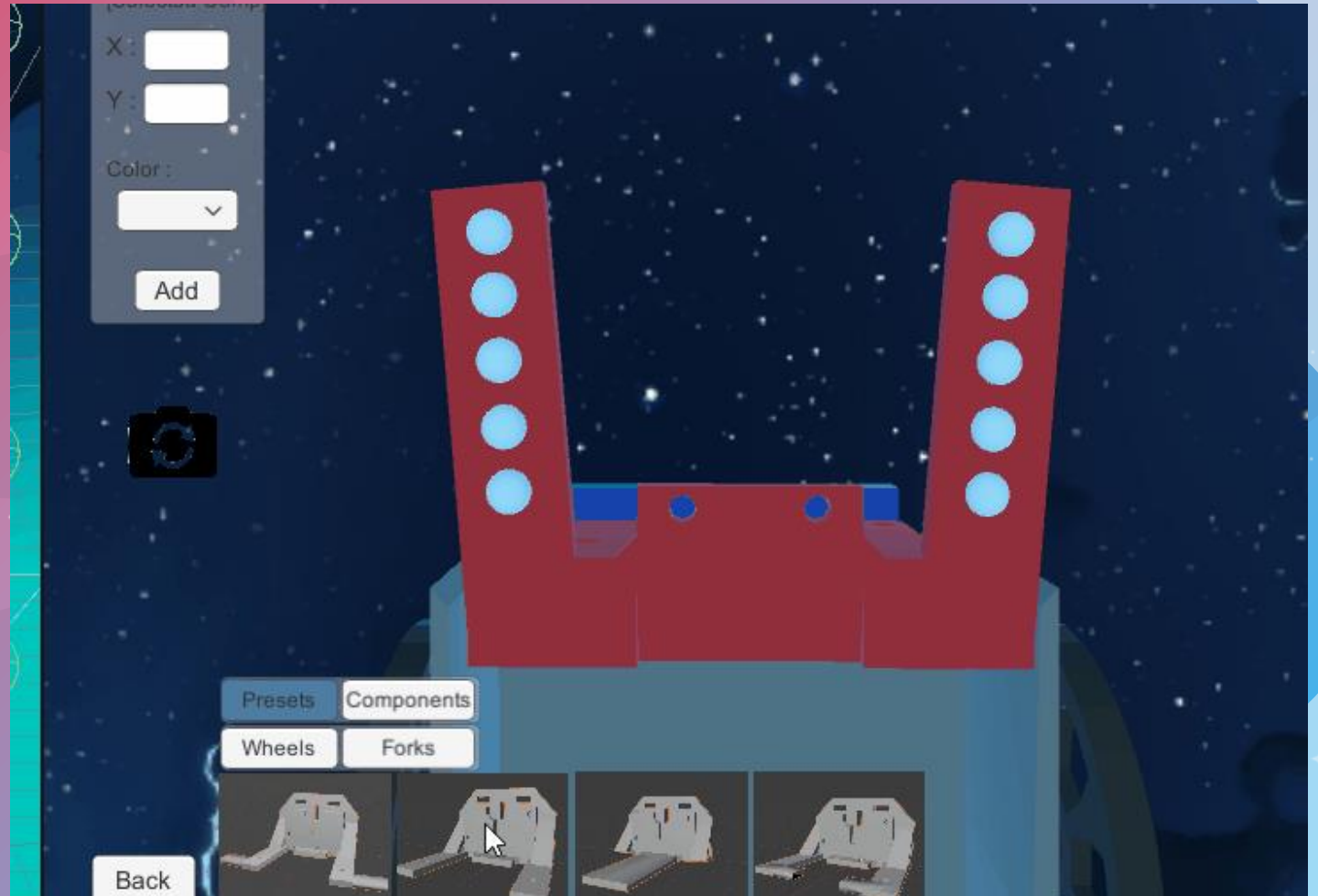
- ❖ create new components
- ❖ snap components
- ❖ select added components
- ❖ delete or modify position of added components



Bot Customization Menu



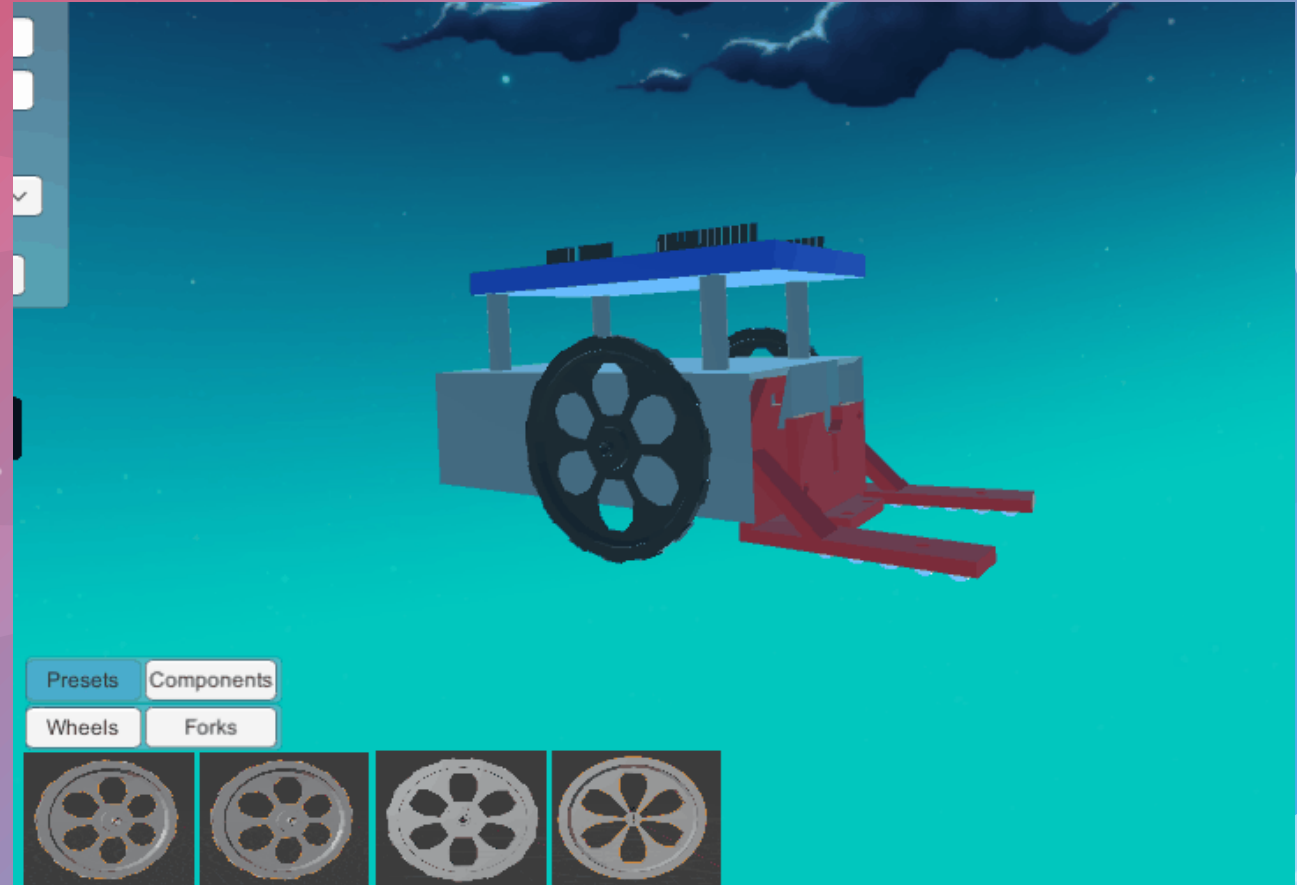
- ❖ Mount preset functionality with:
 - 4 different mount types
 - 4 IR sensor array configurations



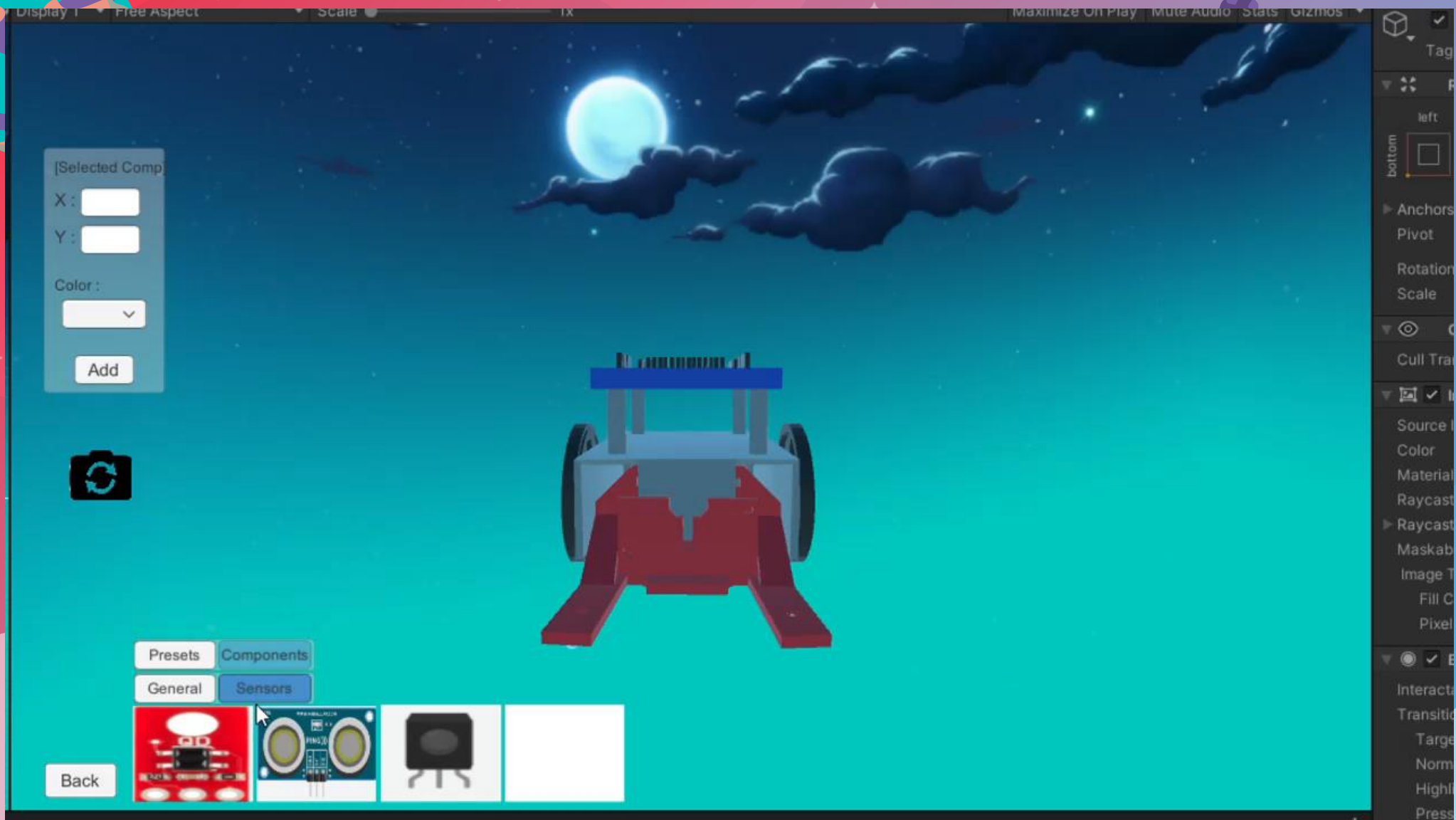
Bot Customization Menu



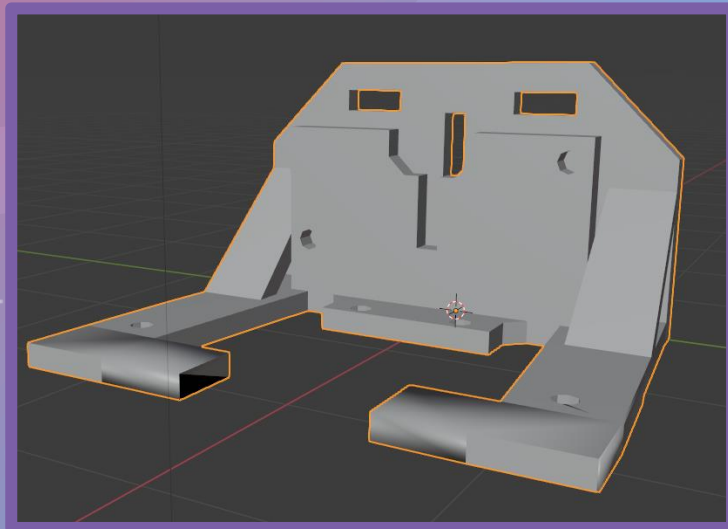
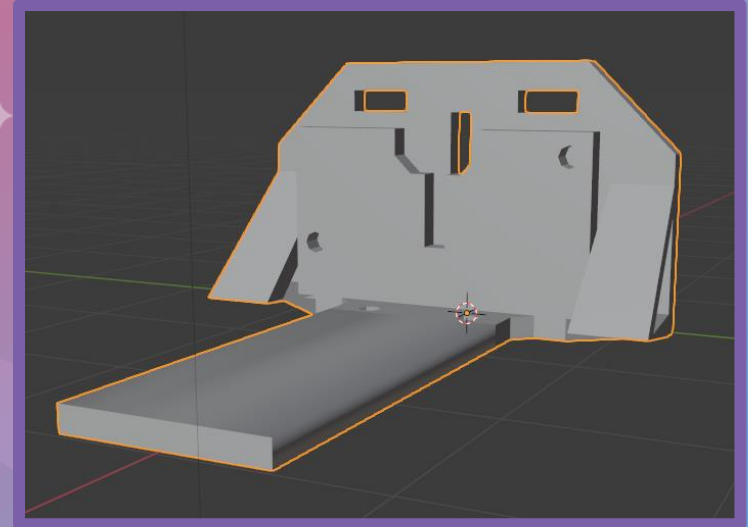
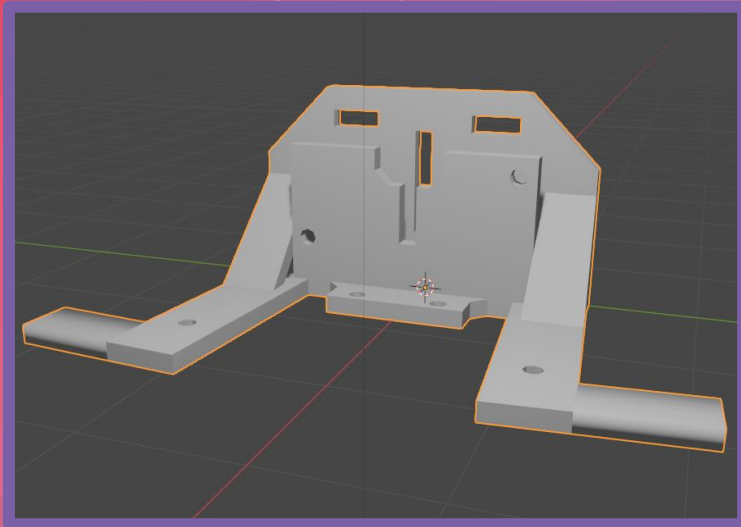
- ❖ 4 different wheel presets



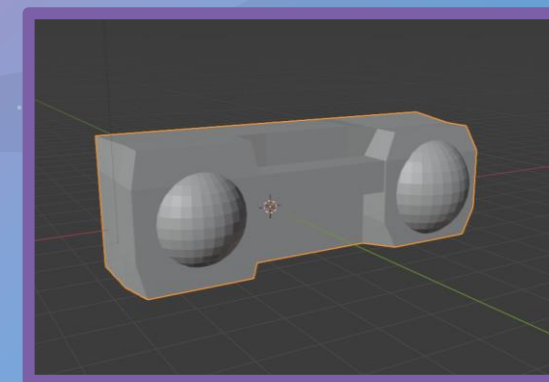
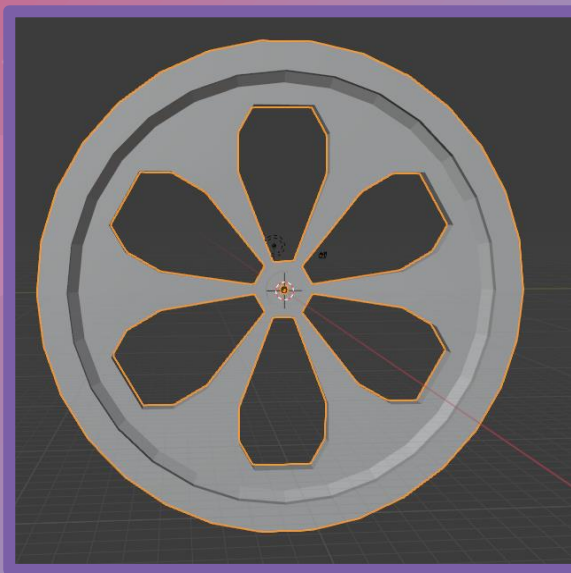
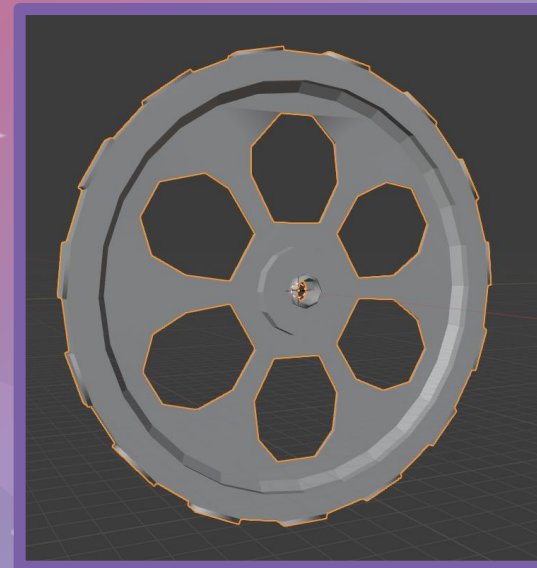
Bot Customization Menu



Models

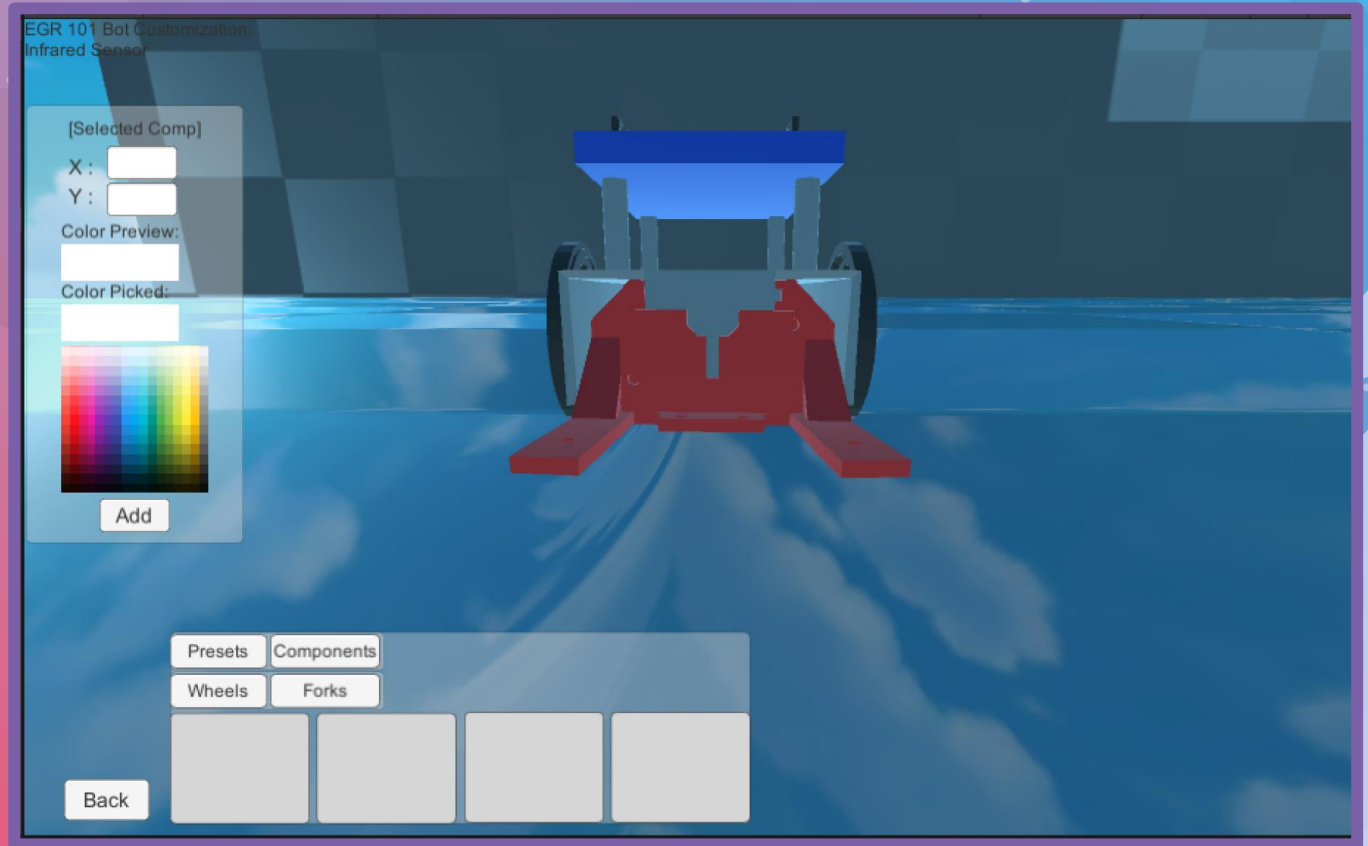


Models



Color Picker

❖ Changes colors of individual components



Bugs

❖ TCP/UDP

- Fixed TCP bug by switching to UDP

❖ Wiring

- Wirecast isn't touching pin

❖ Bug Document

Semester Timeline

SPRINT 4

- ❖ Bot customization functionality
- ❖ IDE styling and functionality improvements
- ❖ Completed more models

SPRINT 5

- ❖ Bot wiring functionality
- ❖ Bot simulation updates components from customization
- ❖ Improve the GUI

SPRINT 6

- ❖ Bug fixes
- ❖ Polishing

Lessons Learned

- ❖ Start work earlier
- ❖ Distribute more comprehensive tasks
- ❖ Communicate more
- ❖ Be more cautious when merging



THANK YOU!

Any questions?