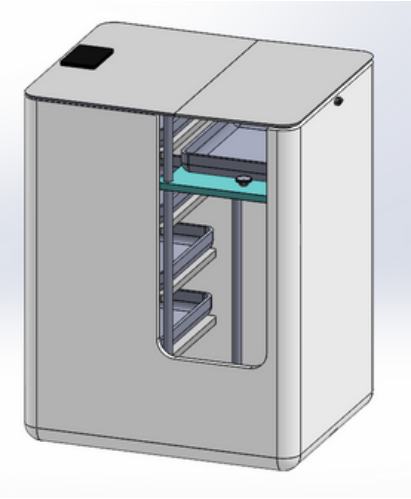
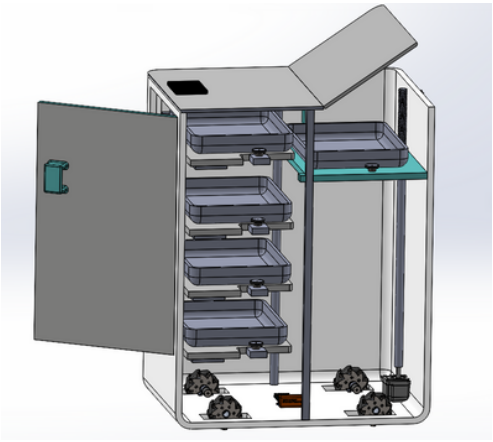
BENJAMIN LEE

MECHANICAL ENGINEERING AT THE UNIVERSITY OF BRITISH COLUMBIA

BenL25846@gmail.com
linkedin.com/in/benjamlee
(778) 233 - 2326

RESTAURANT ROBOT SERVER





What?

- Designed a restaurant robot that automatically delivers food to customers
- Relies on sensors and motors to transport food from the kitchen to the customers

How?

- Use **SolidWorks** to CAD and perform part analysis (**FEA**)
- Sourced electronics components necessary to function robot (Microcontroller, motors, actuators)

Results

- Formally presented concept to a group of judges and received design feedback
- Strengthened skills in electromechanical design, FEA, and part modelling

POSTURE-INO: ELECTRONIC POSTURE CORRECTOR

Postureino_Code

```
  Serial.begin(9600);       // sets the serial port to 960
}

void loop()
{
  x = analogRead(0);        // read analog input pin 0
  y = analogRead(1);        // read analog input pin 1
  z = analogRead(2);        // read analog input pin 1
  /*Serial.print("accelerations are x, y, z: ");
  Serial.print(x, DEC);     // print the acceleration in t
  Serial.print(" ");        // prints a space between the
  Serial.print(y, DEC);     // print the acceleration in t
  Serial.print(" ");        // prints a space between the
  Serial.println(z, DEC);   // print the acceleration in t
  delay(100);               // wait 100ms for next reading
  int yDEC = (y, DEC);
      Serial.print("Your sitting angle is " );
      Serial.print(abs(390 - y));
      Serial.print(" from vertical");
      Serial.println();
  //detect slouching
  if (y < 375){
    tone(buzzer, 1000);
    Serial.println("SIT UP STRAIGHT! YOU'RE SLOUCHING");
  }
  else {
```

What?

- Electronic posture corrector that alerts of poor sitting posture and tracks sitting data
- Made with minimum waste and recycled materials

How?

- Constructed from electronic components and **Arduino** hardware
- Software programmed in **C++**
- Prepared accelerometer with **iron and solder**

Results

- Posture-ino recorded data and alerted 14 students of their poor sitting posture
- Gained knowledge of engineering sustainability

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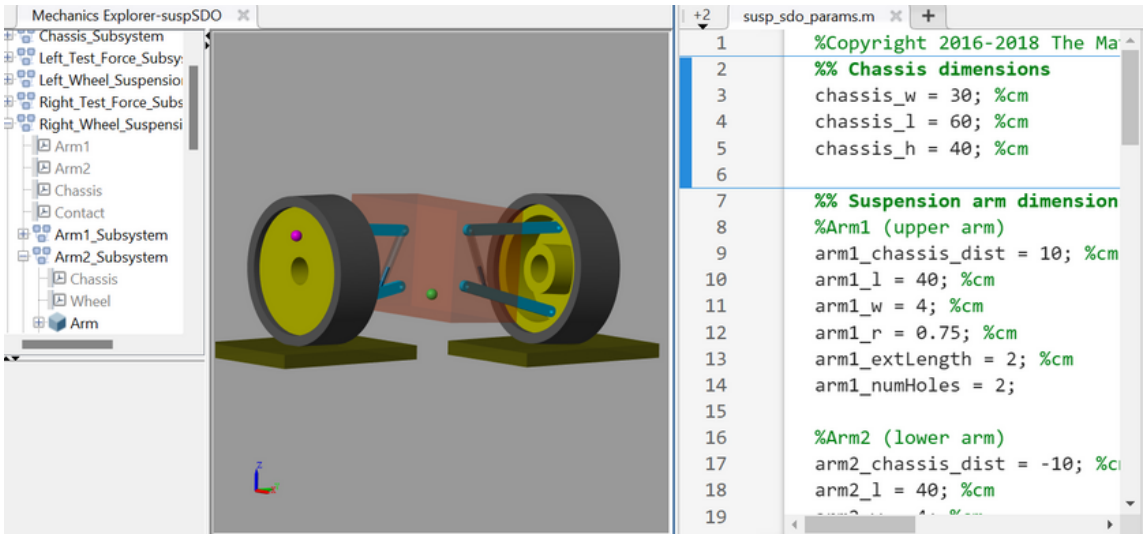
VEHICLE SUSPENSION MODELLING



What?

- **MATLAB Simscape/Simulink** model of car suspension
- Simple CAD models are used in this version, but more detailed geometry can be used for later versions

How?

- Produced **3D CAD** models for assembly using **Solidworks**
- Created **Block Diagrams** to create a simple model that shows suspension characteristics such as Roll Center and ICZV

Results

- Gained experience in **SolidWorks, MATLAB programming,** and **Block diagram modelling**
- Model can be used to simulate suspension pressure, mass flow rate, displacement