

DEMO #3 CAMERA & LID LOCK

CECS 490B SENIOR DESIGN
SPRING 2023



TEAM MEMBERS



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Anand Jasti



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EXECUTIVE SUMMARY

- NAME: "R3-COOLER"
- FEATURES:
 - COOLING TO KEEP THE DRINK COLD
 - AVOIDS OBSTACLES
 - REMOTE-CONTROLLED MOTORS
 - MONITOR BEVERAGE CONSUMPTION (QR SCANNER)
 - REFILL ALERT
 - LCD SCREEN
- EXTRA FEATURES IF TIME PERMITS:
 - BUILT-IN SPEAKER
 - GPS TRACKING



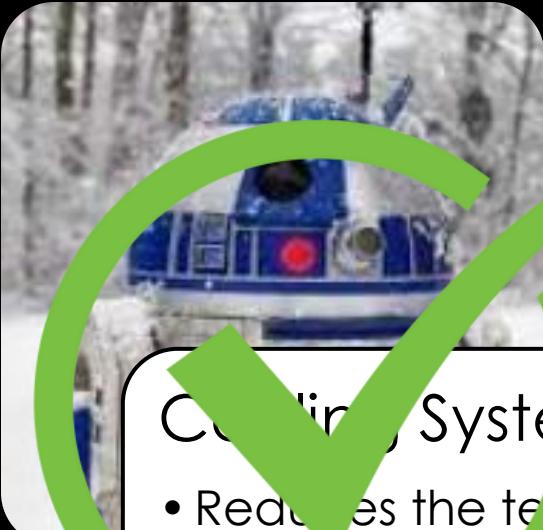
THIS PROJECT WILL ELIMINATE THE PROBLEM OF GUESTS RUMMAGING THROUGH YOUR FRIDGE TO FIND A DRINK AND IT WILL PAVE NEW WAYS TO ENTERTAIN/SHOW OFF TO YOUR GUESTS. WE ARE ALL LOOKING FORWARD TO PLANNING AND CREATING THIS PROJECT TO THE BEST OF OUR ABILITIES.

DEMO TIMELINE



Weight Sensing

- Measures the weight of Cans inside the cooler
- Determines the amount of 12oz and 16oz cans in the cooler



Cooling System

- Reads the temp within the cooler
- Monitors temp and automatically turns off when the desired temp is reached or vice versa.

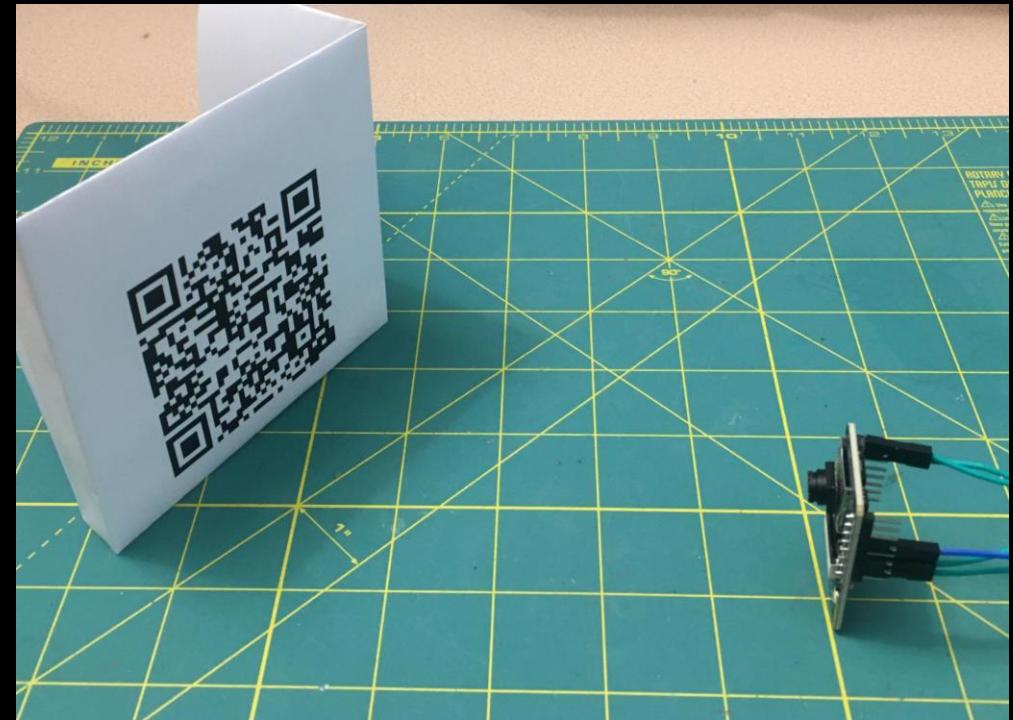


Camera

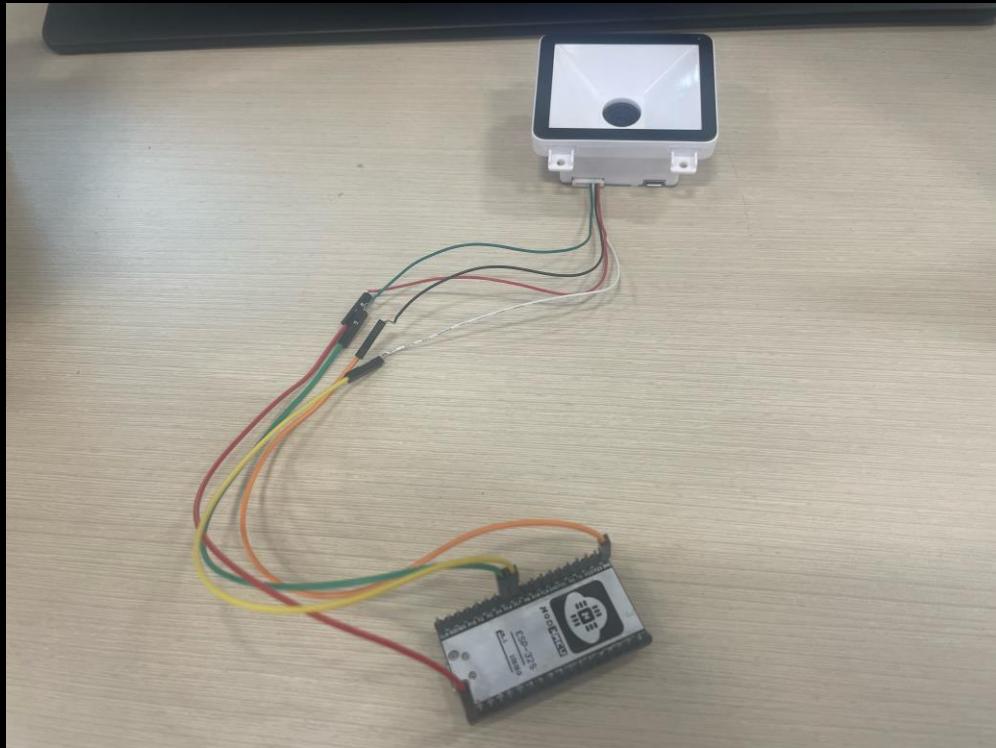
- Scans QR-codes
- Validates the QR-code
- Sends a message to the serial monitor if it's a valid QR-code

DEMO #3 - CAMERA

- WHAT WILL BE TESTED?
 - CAMERA
- HOW WILL IT BE TESTED?
 - CASE #1: ABLE TO GENERATE QR CODE FROM THE APP
 - CASE #2: ABLE TO SUCCESSFULLY SCAN THE QR CODE
 - CASE #3: DETERMINES THE VALIDITY OF THE QR CODE
 - CASE #4: SEND A MESSAGE TO THE SERIAL MONITOR IF VALID
 - CASE #5: ABLE TO UNLOCK THE LID DOOR
- HOW WILL WE KNOW IT WORKED?
 - ALL CASES PASSED



MAIKRT CAMERA



MAIKRT CONNECTED TO THE
ESP32



MAIKRT

CAMERA CODE

```
-- 53
54 if (mySerial.available()) // Check if there is Incoming Data in the Serial Buffer.
55 {
56     while (mySerial.available()) // Keep reading Byte by Byte from the Buffer till the Buffer is empty
57     {
58         char input = mySerial.read(); // Read 1 Byte of data and store it in a character variable
59         Serial.print(input); // Print the Byte
60         delay(5); // A small delay
61     }
62     Serial.println();
63     VAL = "1";
64     delay(1000);
65 }
66 else
67 {
68     VAL = "0";
69 }
70 delay(1000);
71 }
```

THIS CODE READS THE QR CODE AND
SETS THE VARIABLE THAT OPENS OR
CLOSES THE LOCK

```
Serial.print("Setting AP (Access Point)...");  
WiFi.softAP(ssid, password);  
  
IPAddress IP = WiFi.softAPIP();  
Serial.print("AP IP address: ");  
Serial.println(IP);  
server.on("/QR_DATA", HTTP_GET, [] (AsyncWebServerRequest *request){  
    request->send_P(200, "text/plain", VAL);  
});  
server.begin();
```

SENDS THE VARIABLE THROUGH THE ESP
THROUGH THE HTML "QR_DATA"

APP LAYOUT

9:45 9:45 9:46 9:46 9:47

Home QRCodeGeneration QRCodeGeneration QRCodeGeneration 714

Update Menu Create QR Code

42°F 12 99%

Temprature Drinks Left Battery

Enter Name

Abhishek

ENTER

ENTER

ENTER

Share

Share

Share

QR Code

Nearby Edit

(714)
395-7593

Print Gmail Messages Photos
Upload to P...

Wednesday, Mar 29 • 12:30 AM

Texting with 714 (SMS/MMS)

Add text

MMS

The image displays five screenshots of a mobile application interface, illustrating its layout and functionality across different screens.

- Home Screen:** Shows a dark background with a large R2-D2 illustration. At the top, there are three blue rounded rectangular cards displaying "42°F", "12", and "99%". Below these are two white buttons: "Update Menu" and "Create QR Code". At the bottom, there are three navigation icons: "Home", "Cooler Control", and "Brevage Consumption".
- QRCodeGeneration Screen 1:** Shows a white input field labeled "Enter Name" containing "Abhishek". Below it is a QR code. A "Share" button is located at the bottom.
- QRCodeGeneration Screen 2:** Shows a white input field labeled "Enter Name" containing "Abhishek". Below it is a QR code. A "Share" button is located at the bottom.
- QRCodeGeneration Screen 3:** Shows a white input field labeled "Enter Name" containing "Abhishek". Below it is a QR code. A "Share" button is located at the bottom.
- Messaging Screen:** Shows a messaging interface with a recipient "714". It includes a contact card with a profile picture, phone number "(714) 395-7593", and sharing options for Print, Gmail, Messages, and Photos. The status bar shows the date and time: "Wednesday, Mar 29 • 12:30 AM" and "Texting with 714 (SMS/MMS)". The bottom of the screen features a message input field with a QR code icon and "Add text" button, along with standard messaging controls for attachments and MMS.

APP CODE

```
0 references
private void OnGenerateClicked(object sender, EventArgs e)
{
    //password = await service.GetStringAsync(new Uri("http://172.20.10.2/ledOn"));
    password = "R3Cooler";
    QRCodeGenerator qrGenerator = new QRCodeGenerator();
    QRCodeData qrCodeData = qrGenerator.CreateQrCode(InputText.Text+"."+password, QRCodeGenerator.ECCLevel.L);
    PngByteQRCode qRCode = new PngByteQRCode(qrCodeData);
    byte[] qrCodeBytes = qRCode.GetGraphic(20);

    var ims = ImageSource.FromStream(() => new MemoryStream(qrCodeBytes));

    filePath = Path.Combine(FileSystem.CacheDirectory, InputText.Text+".png");
    File.WriteAllBytes(filePath, qrCodeBytes);

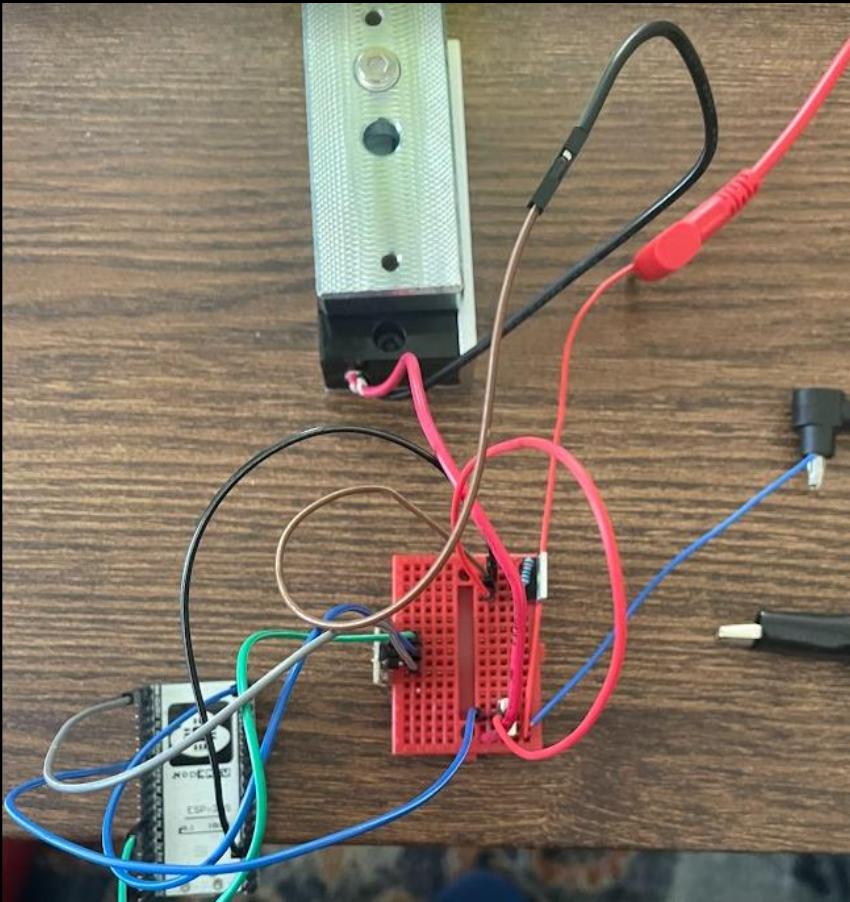
    QrCodeImage.Source = ims;
}
```

- **ALLOWS US TO CREATE OUR OWN QR CODE WITH A SECRET PASSWORD.**
- **DISPLAYS THE CREATED QR CODE ON THE SCREEN**
- **SAVES THE QR CODE INTO APP'S CACHE DIRECTORY AS PNG.**

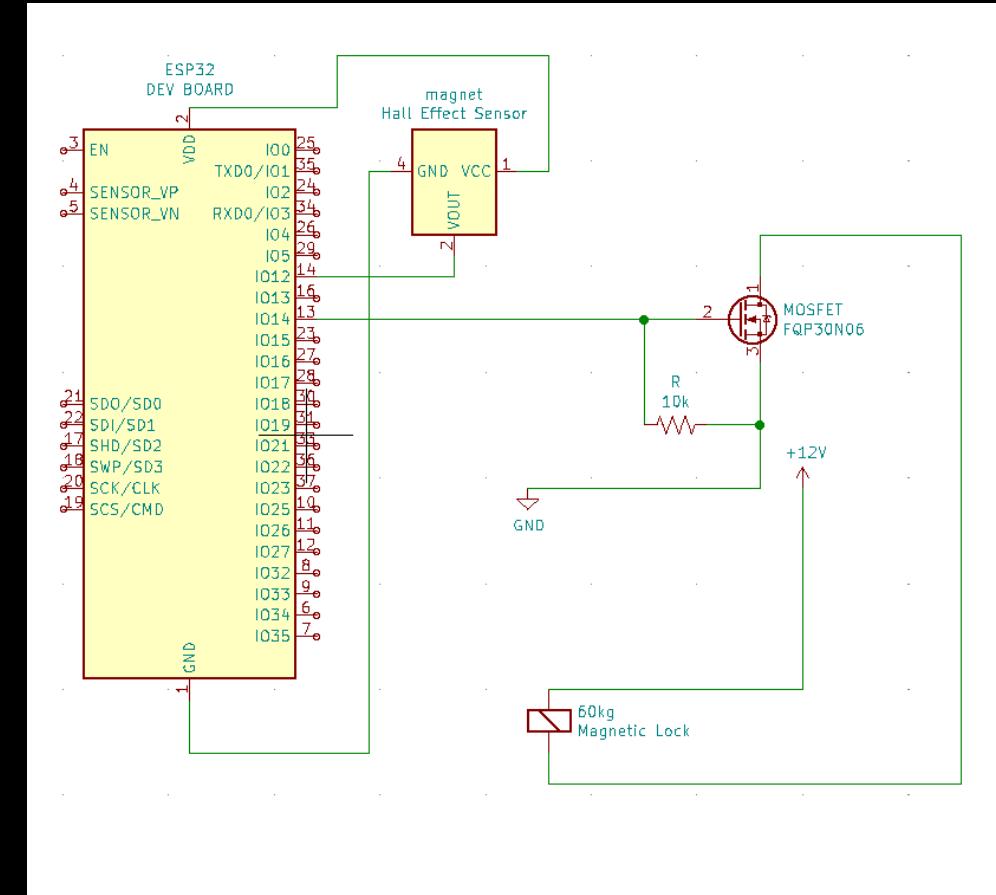
- **RETRIEVES THE SAVED QR CODE PICTURE.**
- **QR CODE IS SHARED USING THE DEFAULT SHARE OPTIONS, DEPENDING ON THE DEVICE.**

```
0 references
private async void ShareBtn_Clicked(object sender, EventArgs e)
{
    if (File.Exists(filePath))
    {
        await Share.Default.RequestAsync(new ShareFileRequest
        {
            Title = "Share QR Code",
            File = new ShareFile(filePath)
        });
    }
}
```

MAGNETIC LOCK



LOCK CONNECTED TO ESP32



SCHEMATIC

MAGNETIC LOCK CODE

```
void loop() {  
  
    // read the value of the hall effect sensor pin  
    int hallValue = digitalRead(HALL_SENSOR_PIN);  
  
    bool code = true; // QR-Code not detected  
  
    if (hallValue == 0 && code) {  
        if(!lidLocked){  
            digitalWrite(MOSFET_PIN, HIGH); // Lock the Magnetic Lid Lock  
            lidLocked = true;  
        }  
    } else{  
        if(lidLocked){  
            digitalWrite(MOSFET_PIN, LOW); // Unlock the Magnetic Lid Lock  
            lidLocked = false;  
        }  
    }  
}
```

```
// define the pin number for the MOSFET gate  
#define MOSFET_PIN 13  
  
// define the pin number for the hall effect sensor  
#define HALL_SENSOR_PIN 4  
  
bool lidLocked = false;  
  
void setup() {  
  
    // initialize the serial port  
    Serial.begin(115200);  
  
    // initialize the MOSFET pin as an output  
    pinMode(MOSFET_PIN, OUTPUT);  
  
    // initialize the hall effect sensor pin as an input  
    pinMode(HALL_SENSOR_PIN, INPUT);  
}
```

**ESP32 BOARD CONNECTED TO THE MAGNETIC
LOCK RECEIVES DATA THROUGH WI-FI FROM
THE ESP32 BOARD CONNECTED TO THE CAMERA**

LIVE DEMO

CHECKLIST



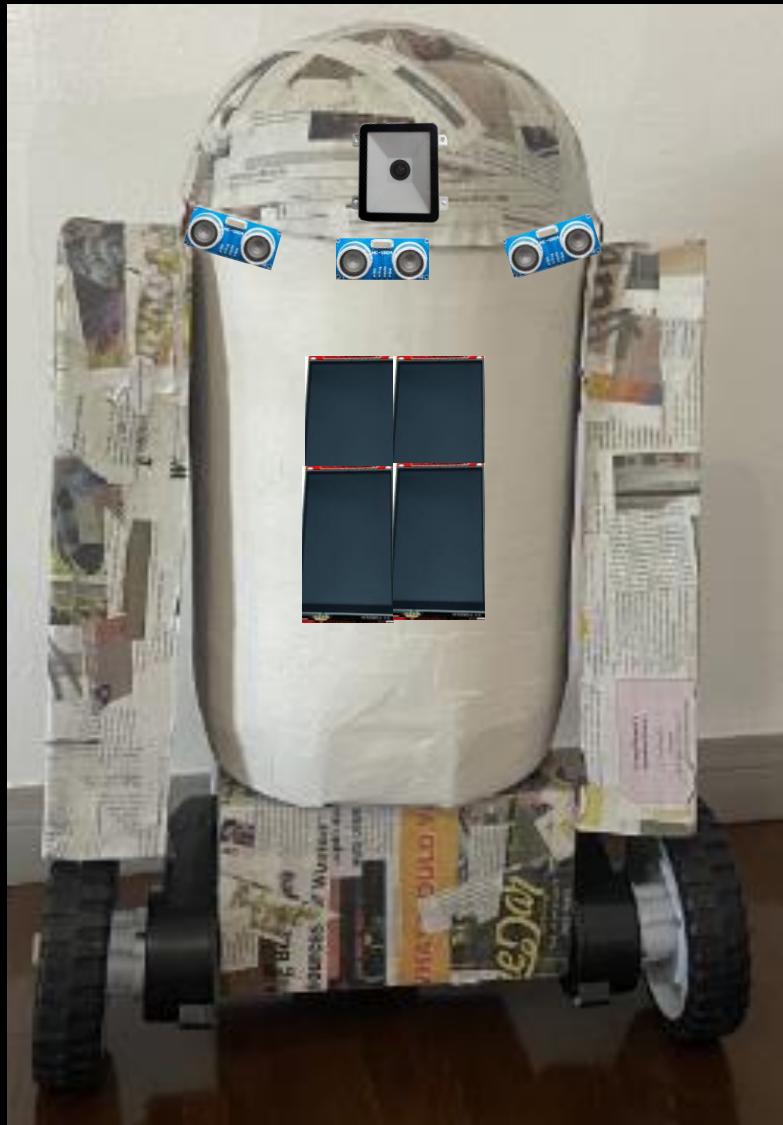
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CHALLENGES ENCOUNTERED

- ESP-32 CAM DID NOT WORK CONSISTENTLY, REQUIRING A SWITCH TO THE MAIKRT QR SCANNER
- CONNECTION AND INTEGRATION BETWEEN THE CAMERA, LID LOCK AND APP
- GENERATION OF QR CODES AND PASSWORD FROM THE APP



R3 OUTER SHELL



FRONT



BACK

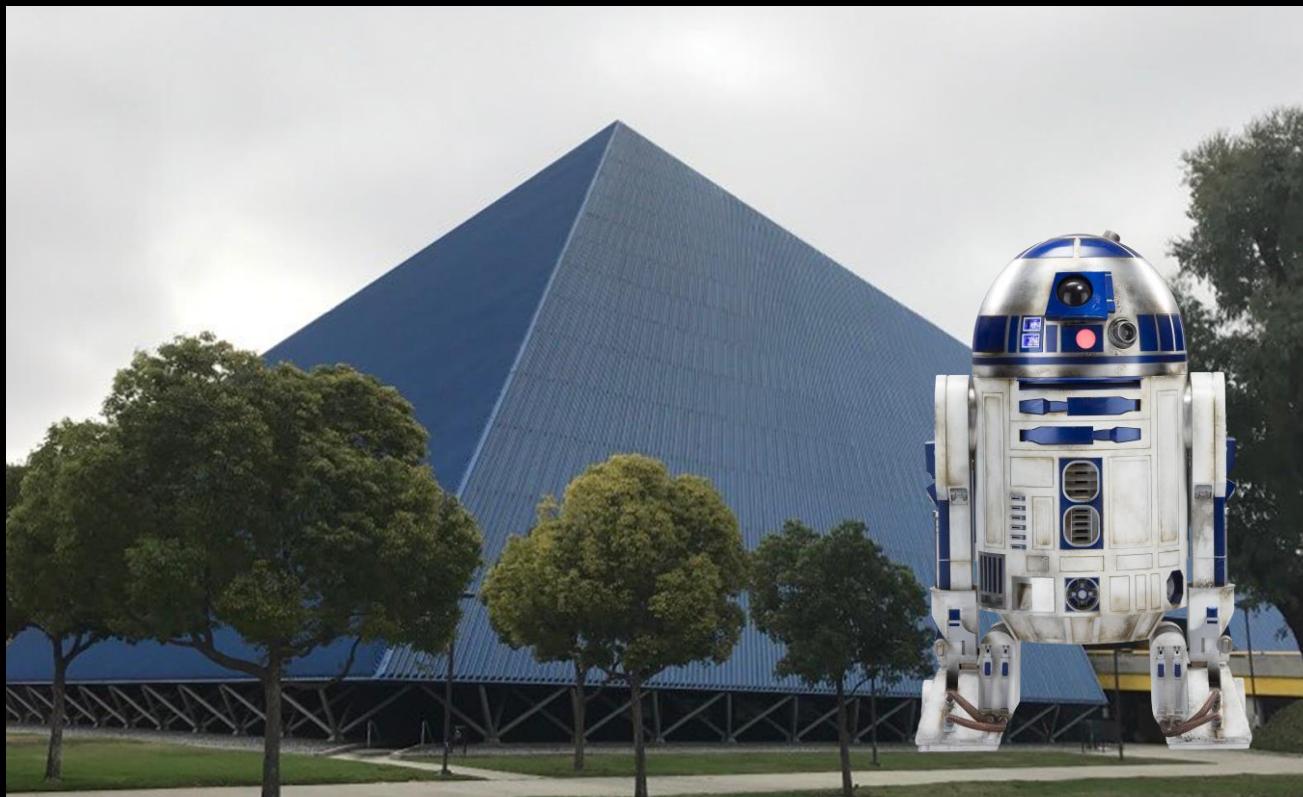


COOLERS

FINAL PROJECT - SENIOR EXPO

- **WHAT'S NEXT?**

- **PREPARE R3 FOR SENIOR EXPO**
 - POWER SYSTEM
 - CONNECTION OF DEMOS
 - FINAL DESIGNING/TOUCH-UPS



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