

Arduino Vending Machine

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Design Problem

- Current vending machines are
 - Bulky
 - Expensive
 - Built for commercial use
- Not accessible for everyday purchase
- Not for use in a casual setting
- Target consumers are
 - Office spaces
 - Hotel chains
 - For personal use in homes/dorms

Design Solution

- We built a small platform, inexpensive vending machine
 - Fits on tables, counters, and other small elevated spaces
- Dispenses small amenities at a low cost
- Intuitive user interface

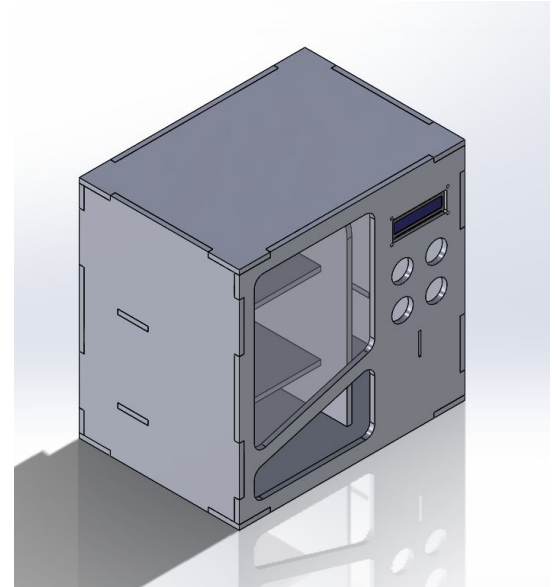
Design Specifications

- \$125
- 30cm x 30 cm x 20 cm
- Materials:
 - Electromechanical Components
 - Arduino
 - LCD
 - Pushbuttons
 - Infrared Break Beam Sensor
 - Servo motors
 - 1/4" plywood
 - Galvanized steel wire coils
 - 1/8" acrylic



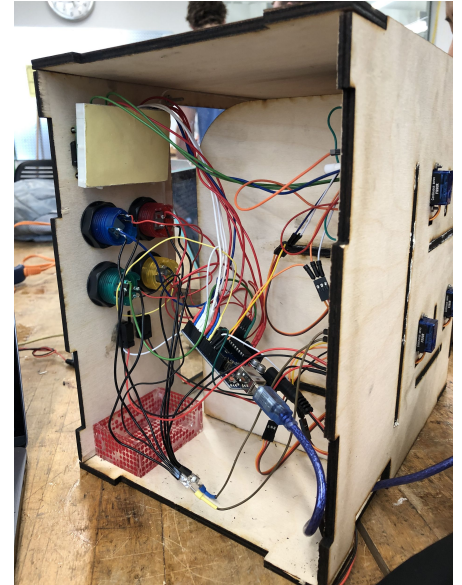
Design Process: Mechanical Design

- Structure design for easy assembly
 - Laser cut panels that fit together
- Housing for items
- Dispensing system (actuator and coils)
- Aesthetics
- Easy accessibility to all parts of the machine
- Coin collection box



Design Process: Hardware/Electronics

- Two breadboards
 - Two were used in order to accomodate for the placement of the LCD
- 9V Power source
- Infrared break beam sensor for coin detection
- Servos used as actuators
- LCD to display information to the user



Design Process: Code/Logic

- Code:
 - Top Down design for easy readability
 - Robust design so more features can be added (i.e different price ranges)
 - Minimizes power usage from 9V battery (LED's and motors are rarely on)

```
void runMotor()
{
    int e=10; // error

    motor.attach(pin);

    motor.write(300);
    delay(1000);
    motor.detach();
    motorOn=0;
    sayThankYou();
}
```

```
void loop()
{
    if (motorOn== 1 && moneyInserted>=cost )
    {
        runMotor();
        moneyInserted=0;
    }
    checkButtonPressed();
}
```



Conclusion

- Future changes
 - Better coin detection
 - Wall adapter for constant power
 - On/off switch for power conservation
 - Could scale to fit more items
 - Utilize Arduino Mega for more interrupt pins
- New skills we learned
 - Crimping and soldering when we don't have wires long enough

