Project Agenda

Project deliverables, video rubrics

Parts	**Date**
Project Idea	4th Nov
Proposal	11th Nov
Code submission	2nd Dec
Real life demo	2nd Dec

Project importance: Time, cost, scope

Requirements:

- Scope(can be added on)
- Time
- Materials
- Cost
- GANTT Template

Smart Conveyor system

- Objective(Both auto and manual operations)
- Material requirements
- Software requirements
- Other requirements
- Cost ($)

Objectives

Automatic:

- The conveyor will run the whole operation by itself

Manual:

- Speed control
- Putting items to the belt

Requirements

- ☐ At least 2 sensors
- ☐ At least 1 actuator
- ☐ HMI
- ☐ Cloud(web based HMI → Ubidots)
- ☐ Automatic
- ☐ Manual

Materials Needed

- 3D Printed parts
- IR sensor x3
- DC motor x1
- Servo motor x2
- Color sensor x1(TCS230/TCS3200)
- LCD Display x1
- H-bridge(L293D)
- Potentiometer
- Arduino
- Resistors (220 Ohm)
- Tape(Duct tape, transparent tape, double sided tape)
- Paper

- Cardboard
- Hot glue gun/epoxy
- Toothpick/skewer sticks
- Wooden board

Software requirements

- Solidworks
- Prusaslicer
- Labview(cloud & HMI)
- Arduino IDE
- EasyPDA
- JLCPCB(for PCB)

Budget

Material	Buying link	Cost(<$50)
IR Sensor x5	https://www.amazon.ca/dp/B07FFM7DYQ?psc=1&smid=A34K5WF5Z9R33P&ref_=chk_typ_imgToDp	10.18
Dc Motor x1	https://www.amazon.ca/dp/B0755CJL2H?psc=1&smid=A2KRDQ1AI5Y5G6&ref_=chk_typ_imgToDp	10.99
Color Sensor	https://www.amazon.ca/dp/B08HH8QYF8?psc=1&smid=A38CU2XC1RY0BO&ref_=chk_typ_imgToDp	9.99
Epoxy glue	Canadian Tire	$14.99

Research Videos

- How To Make A Conveyor Belt System At Home || Conveyor Belt Model || Homem…

- Color object sorting conveyor belt with counting using Arduino
- Color Sensor Product Sorting Conveyor Belt PLC Automation Project
- How to Use a TCS3200 Color Sensor with Arduino (Lesson #38)
- How does work IR SENSOR with Arduino nano | IR SENSOR full tutorial [Codes a…
- VERY EASY Arduino IR Sensor Tutorial for Beginners | IR Sensor Arduino Tutorial …
- DC Motor Control with an H-Bridge and Arduino (Lesson #17)
- How to Control a 12V Motor with Arduino: Easy Wiring & Code Examples

Transferring Arduino code to LABVIEW:
LabVIEW Basics #1 - Blinking an LED and setting up LINX (2019) on an Arduino UNO

Constraints

- There can be only one item at the conveyor belt
- Levers are not able to push metal blocks
- Belt requires some sort of roughness to produce friction

Extension

- More than one block on the conveyor belt → leads to a longer belt??

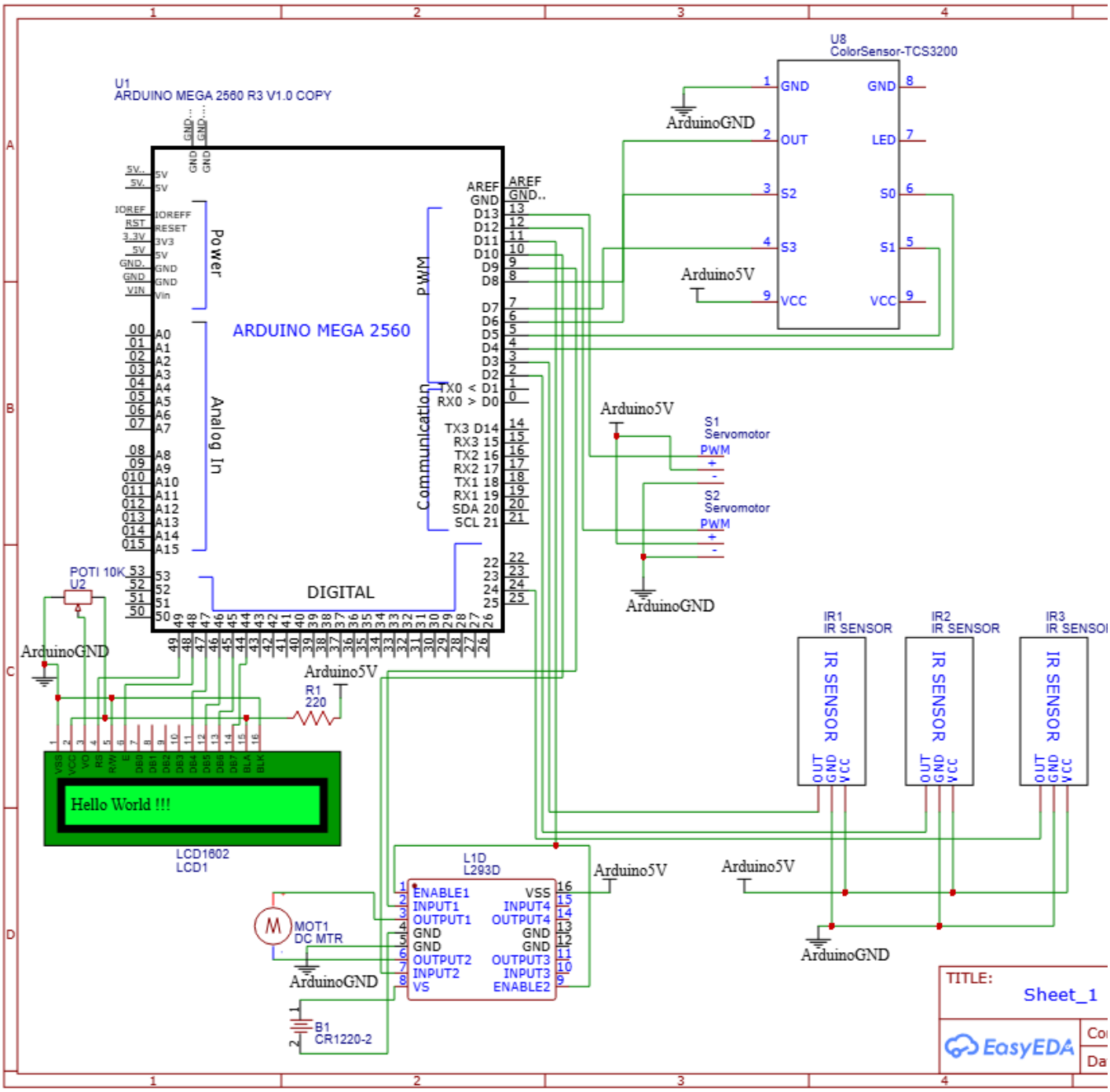
School resources

- 3D printing space:
  - The Thode Library Makerspace(Self printing → book a week ahead)
  - Lyons 3D printing(4th floor Mills Library) → 3D printing service
- Design softwares(solidworks 3D):
  - ETB B-Tech Lab
  - Personal subscriptions?

Timeline

Time	Milestones	Description
Week 1(4th)	Milestone 1	Research: ● Find out existing projects ● Draw a rough design of your project ● Find out about unknown electric components ● Find out the scales of the 3D printing parts
	Milestone 2	Gathering materials: ● Gather electric components(order if needed) ● Create a circuit diagram of your system(TinkerCAD) ● Implement code for system operation
Week 2(11th)	Milestone 1	Start designing 3D printed parts
	Milestone 2	Start printing parts
	Milestone 3	Start refining on codes, circuits and create the HMI of the project
	Milestone 4	Design a prototype?
Week 3(18th)	Milestone 1	Start Assembling the system
	Milestone 2	Start wiring the circuit
	Milestone 3	Run a few tests, gather feedback
Finishing up(25th)	Milestone 1	Troubleshoot
	Milestone 2	Changes if needed(code, redesign)
	Milestone 3	
Demo(2nd)		Final run during 1st 2hrs of the lab time

Schematic


U1
ARDUINO MEGA 2560 R3 V1.0 COPY
ARDUINO MEGA 2560
Power
Analog In
DIGITAL
PWM
Communication
U8
ColorSensor-TCS3200
GND
OUT
S2
S3
LED
S0
S1
VCC
ArduinoGND
Arduino5V
S1
Servomotor
PWM
S2
Servomotor
PWM
POTI 10K
U2
R1
220
Hello World !!!
LCD1602
LCD1
IR1
IR2
IR3
IR SENSOR
L1D
L293D
ENABLE1
INPUT1
OUTPUT1
OUTPUT2
INPUT2
VS
VSS
INPUT4
OUTPUT4
OUTPUT3
INPUT3
ENABLE2
MOT1
DC MTR
B1
CR1220-2
TITLE:
Sheet_1
EasyEDA