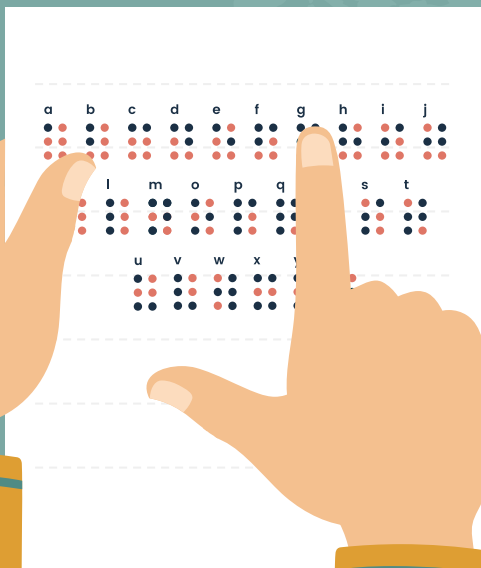


Braille Printer

Hardware Graduation Project 2023



Our Team



**Supervisor
Dr. Samer Arandi**



Momen Odeh



**Noor Aldeen
Abu Shehadeh**

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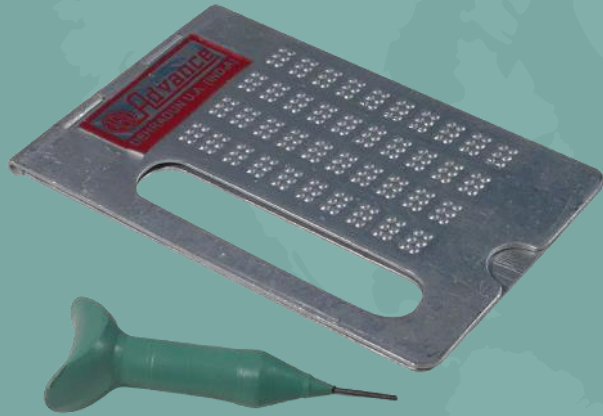


What 's the problem?

People with visual disabilities they face several challenges when need to print text in Braille.

- High cost of Braille printers.
- Limited availability.
- Limited Ease of use.

Evolution of Braille Printers



The Mechanism of converting text to braille

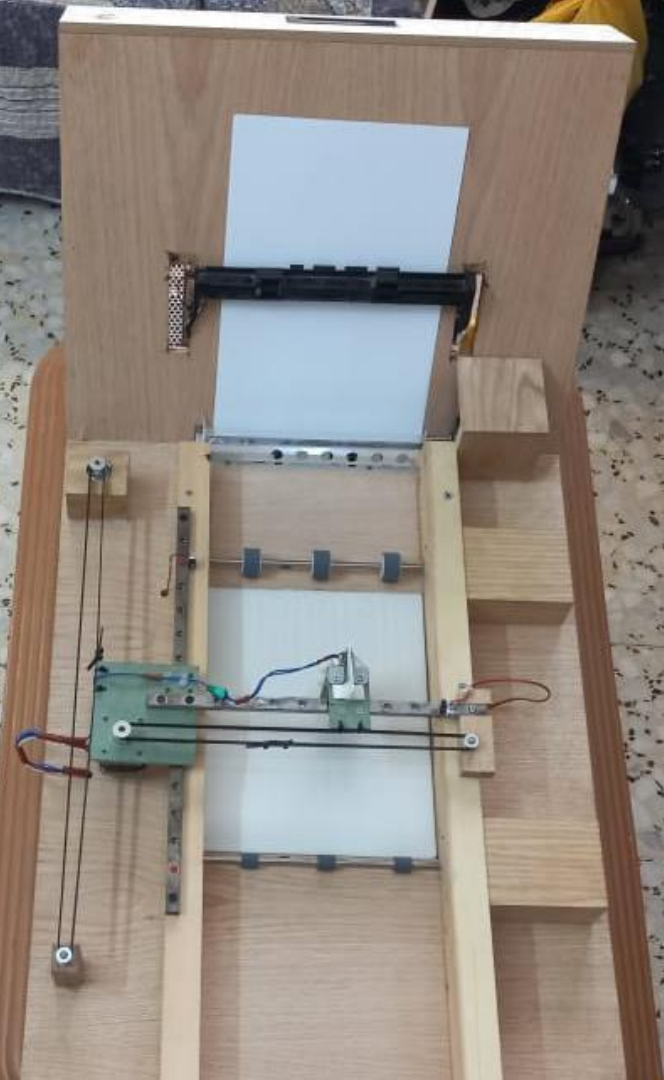
BRaille ALPHABET

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Adobe Stock | #442444534

Braille representation:

It is a tactile code enabling blind and visually impaired people to read and write by touch, with various combinations of raised dots representing the alphabet, words, punctuation and numbers.



Our Solution

We have developed a Braille printer which is:

- affordable .
- easily accessible .
- made with readily available basic parts.

This creative solution enables people with visual impairments to conveniently obtain the resources they need.

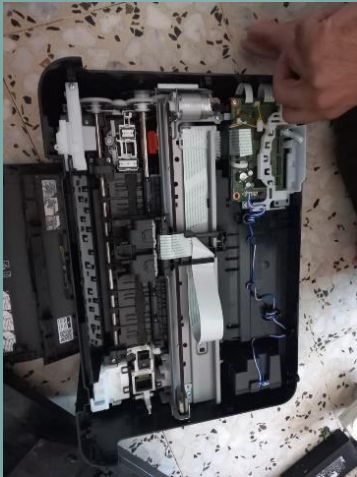




Project Implementation

1. Meet the stake holders

Visit Mr. Samer Aqrouq
Director of the Unit for
Students with
Disabilities



2. Design paper feeding mechanism

Plan the
printer's structure



3. Build XY system movement

Design wood work to
implement support for
XY system

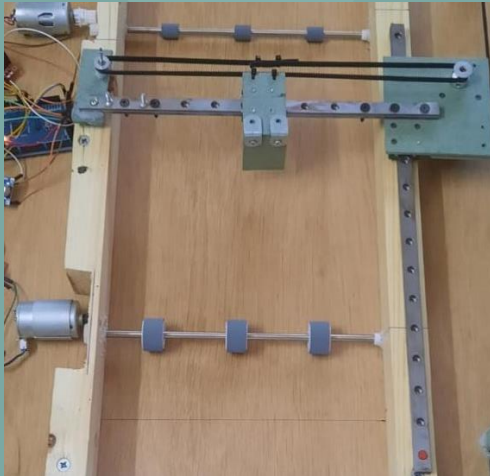




Project Implementation

4. Attach the paper rollers

Attach paper rollers at the start and at the end of printing area



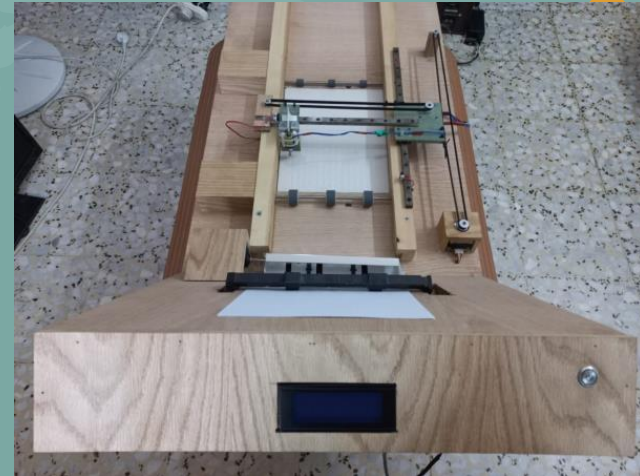
5. Move to the production stage

Revised the old design to increase stability & accuracy.



6. Integration

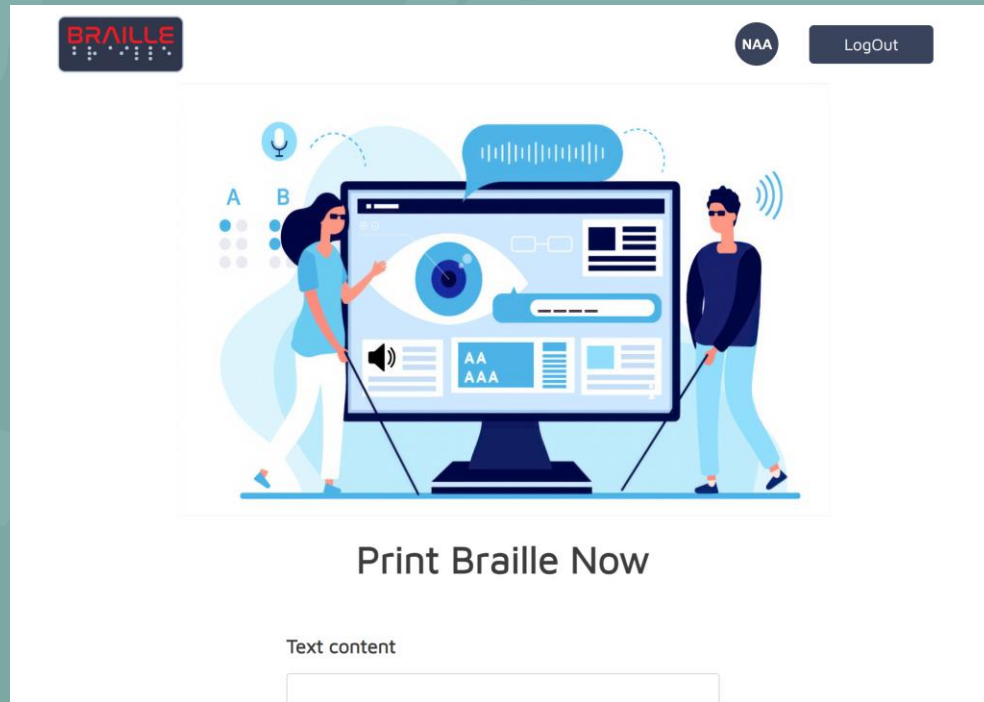
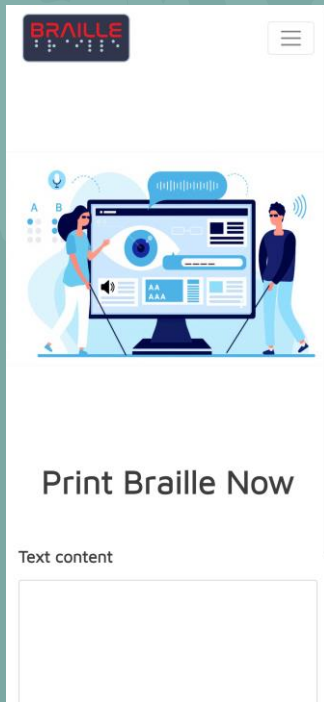
Integrate all components with each other.





Project Implementation

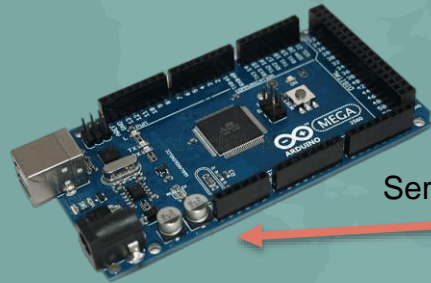
7. Build Web application using React JS





Project Implementation

8. Connect printer with WiFi



Arduino Mega

Serial connection



ESP8266
D1 Mini

WiFi
connection



Firebase

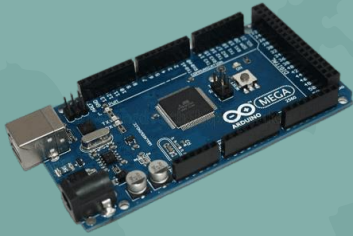


Web Application



Project Components

Hardware components



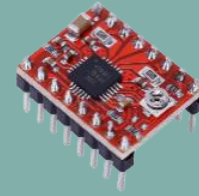
Arduino Mega



ESP8266
D1 Mini



Stepper motor



Stepper motor
driver



Inverter IC



Limit switch



Solenoid



Buzzer



2 channel Relay



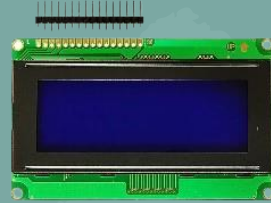
Project Components



Optical sensor



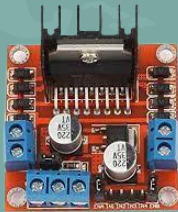
Servo motor



LCD 20*4



DC motor



H bridge



Buck converter



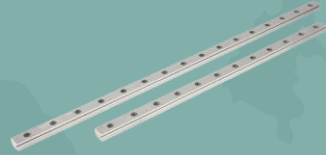
Power supply



Push button

Project Components

Mechanical component



MGN



GT2 Timing



GT2



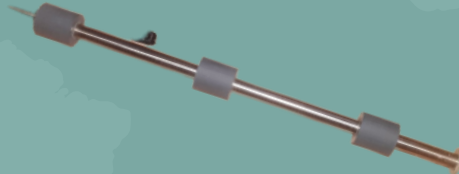
MGN12C



Timing Belt



Big roller



Small roller



Feeder






Braille Pen



A yellow lightbulb with a black base and three lines representing filaments, with three small yellow lines above it indicating light. A dashed white line starts from the bottom of the lightbulb and curves downwards and to the left.

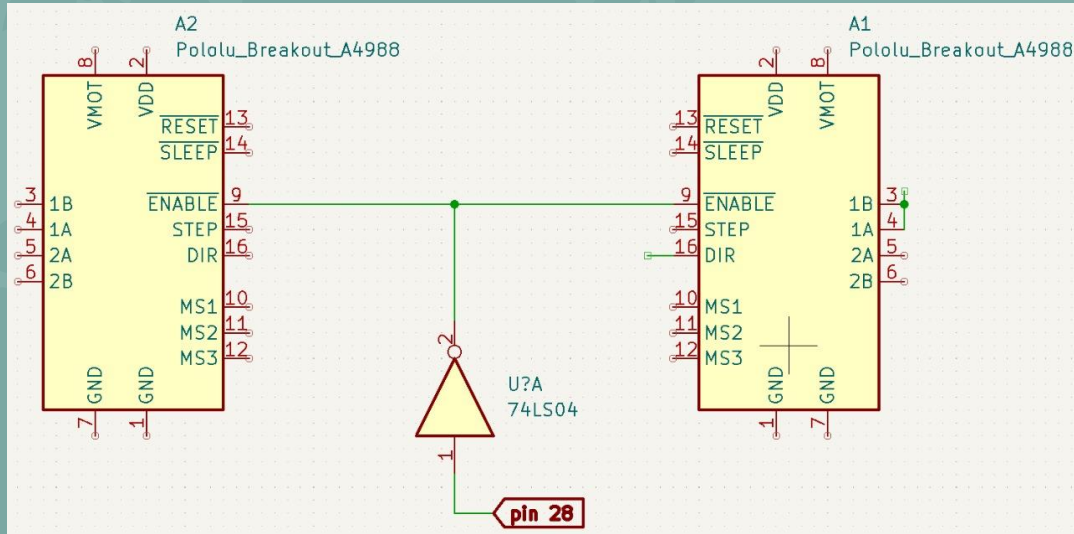
○ Challenges and Constrains

1. Finding a practical & suitable design.
 2. Handling printing papers correctly.
 3. Printing accuracy.
 4. Surface of printing area.
- 
- A solid orange circle.
- 
- A solid orange circle.
- 
- A light blue circle.



Challenges and Constrains

5. Unintended stepper motor rotation when powering the system.

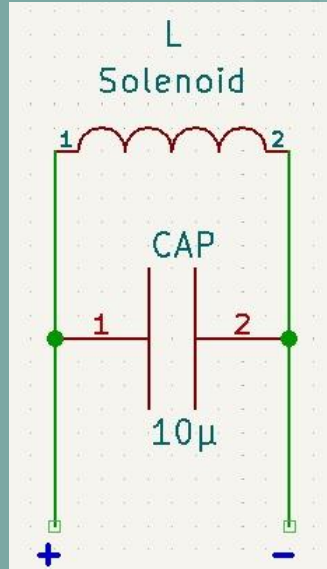


Solution



Challenges and Constrains

6. Disrupting LCD character display when solenoids start knocking.




Solution





Future Work

1. Make the Web application accept formats such as .pdf, .docx, ...etc. Handling paper.
 2. Make the printer accept different sizes of papers such as A5, A3.
 3. Add a scanner that scans the text from papers then send it to printer to print in in Braille.
- 



Thank You

