

EEG CONTROLLED PROSTHETIC HAND

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Along with the technological developments, robotic systems have positively affected many areas in the field of health

One of these areas is the production of prosthesis

Prosthetic hands that many patients expect today can be produced with much simpler versions

The scope of this project was decided after an intensive research on the institutions and the companies that produce the hand prosthesis

AIM

- To provide a method to make life easier for people who have lost their limbs for different reasons
- Producing prosthetic hands with much simpler methods on the contrary to difficult ways
- To decrease the cost of prosthetic hands by using a 3D printer
- Designing different personalized models especially for children

A large, abstract orange watercolor splash graphic on the left side of the slide, with various shades of orange and red, and some darker spots and splatters extending towards the center.

LITERATURE

When studies on this subject are investigated, it is seen that many similar studies have been carried out on this subject

Some of them are as follows:

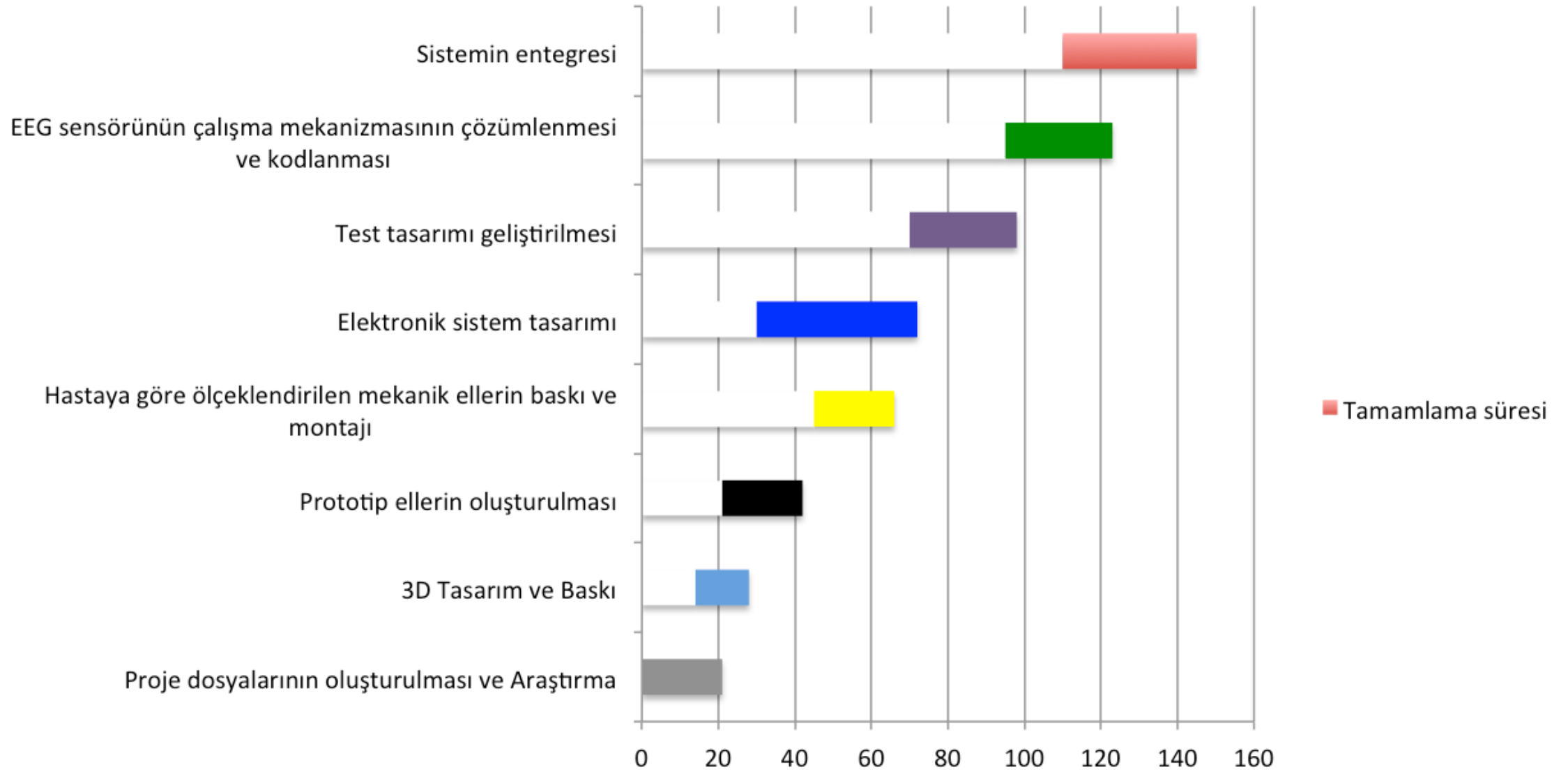
- Robotic hand moving with EEG or EMG
- Emulator robot hand
- Robot hand with touch feeling

GOALS AND PLAN

The project consists of two parts:

The social part is the voluntarily printing of a mechanical robot-hand for a child patient

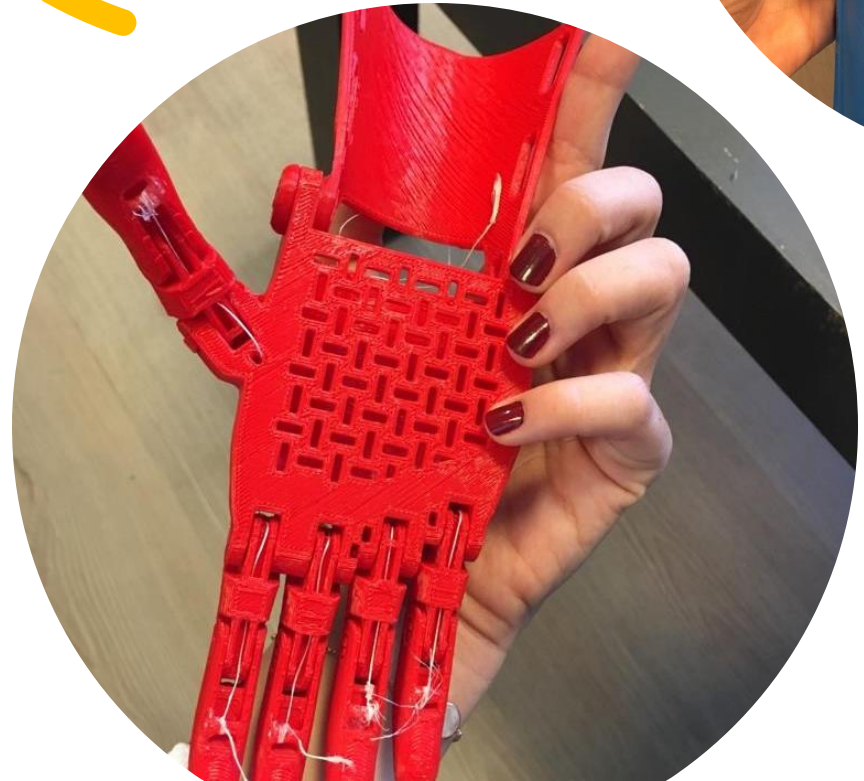
The electronic part is to design a robot hand that is controlled by the brain waves with the help of EEG



'ROBOTEL' ASSOCIATION

- The ROBOTEL Association is a foundation that voluntarily prints 'robot-hands' by using 3D printers for people without hand and arms

ROBOTEL *Türkiye*



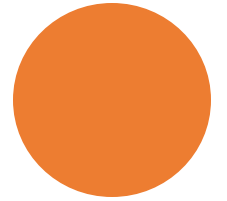


- Meeting was arranged with ROBOTEL Association in Istanbul to get information



PROTOTYPE ROBOT HAND PRODUCTION STAGE

- A company in Ankara University Technocity, that made 3D printing helped to print the prototype hand was printed in this way using 3D printer
- Main material PLA



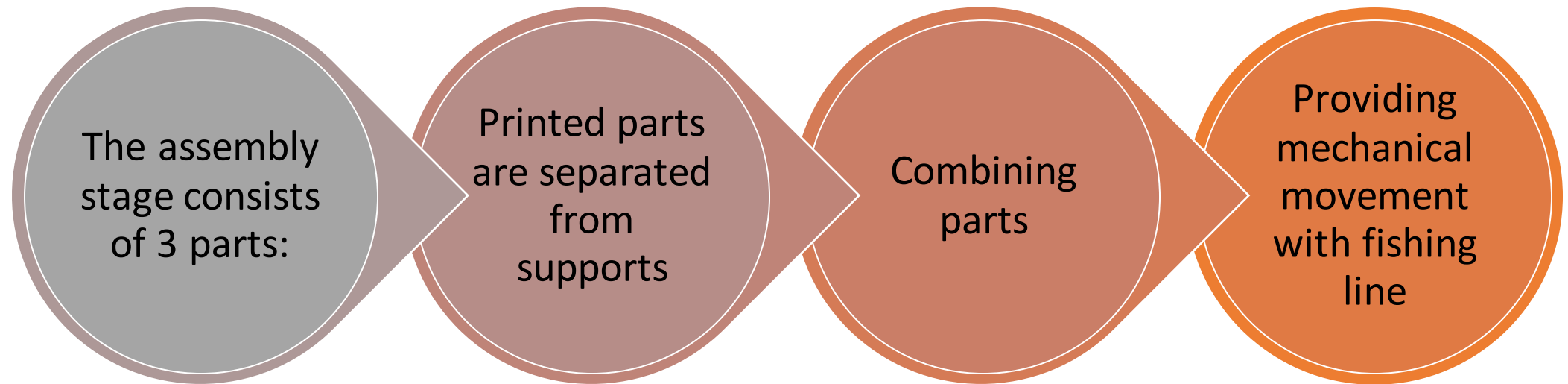


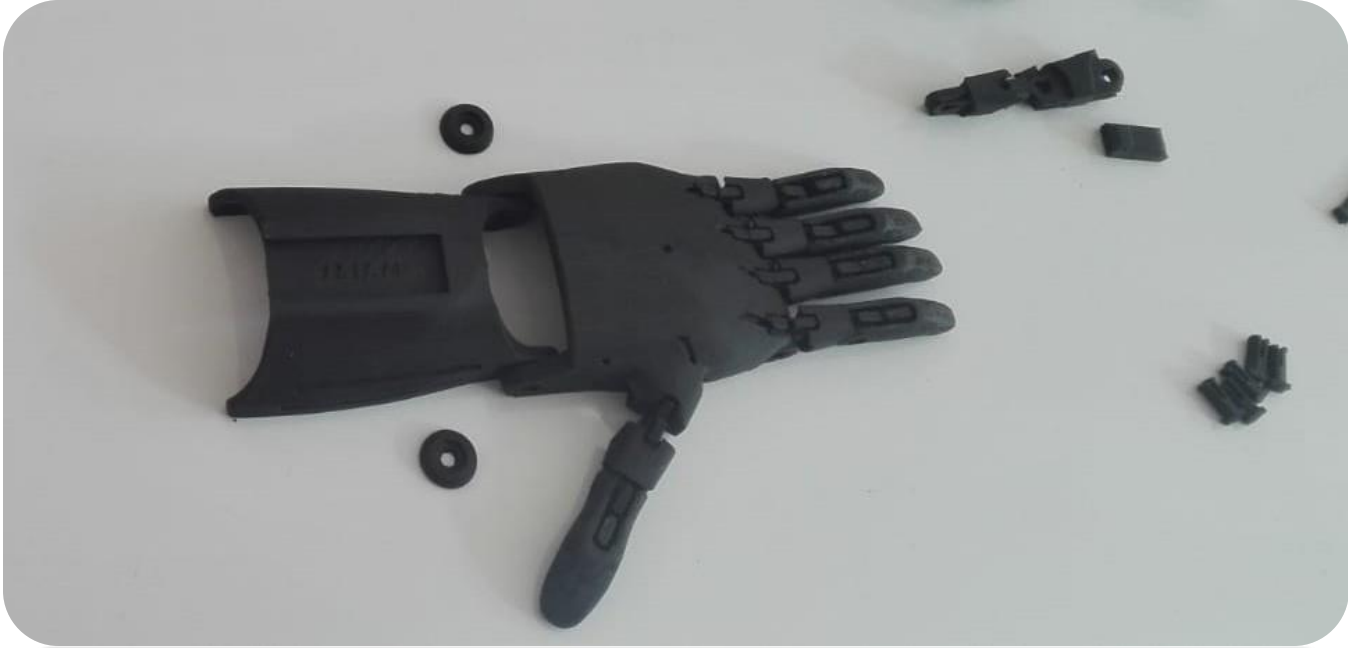
MATERIALS

- Dental bands
- Turnscrew
- Knitting fishing line
- Tensioner screws (optional)



ASSEMBLY STAGES





TRT

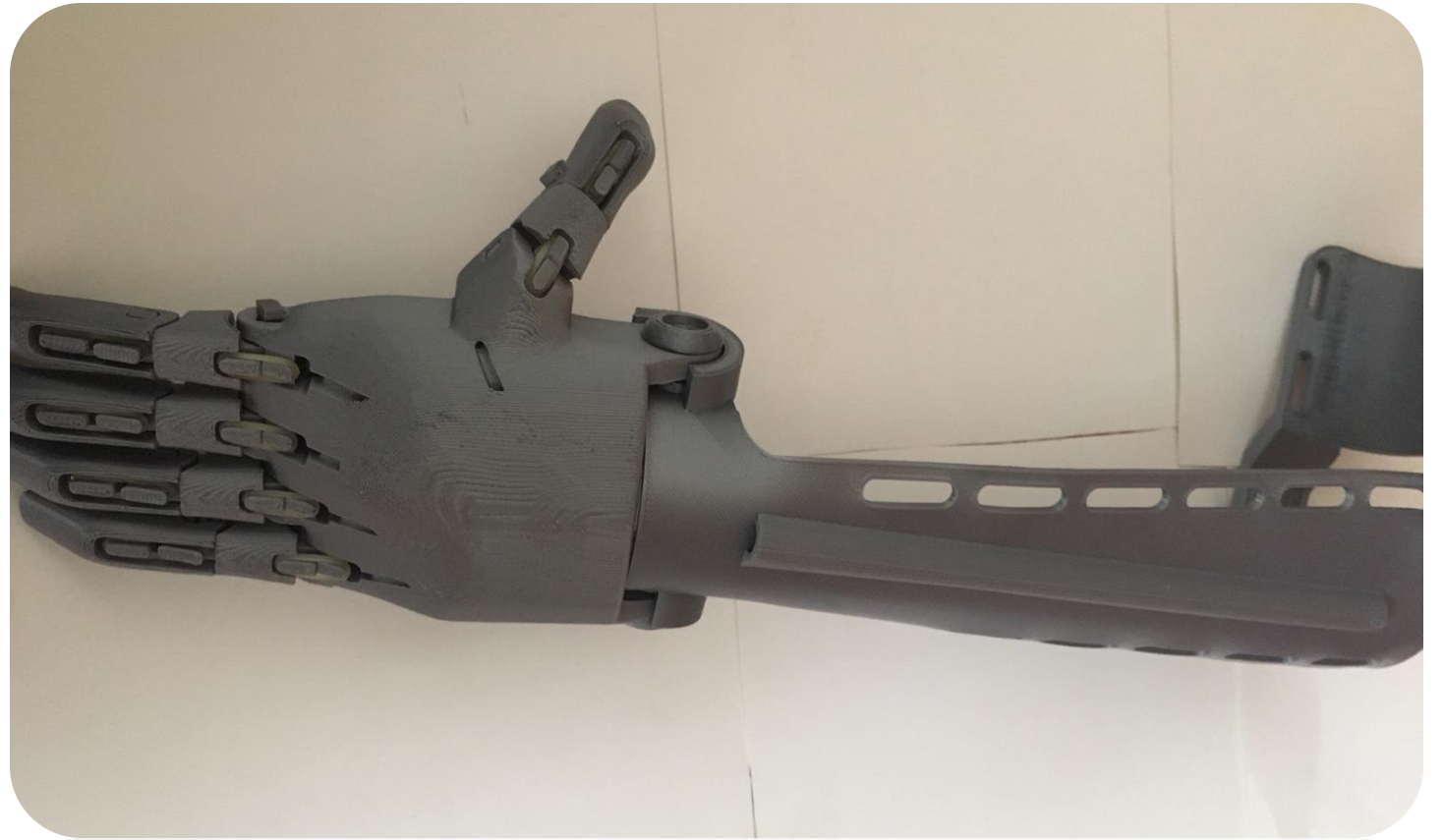


- While continuing project studies with the help of Ankara University Technocity, we had the opportunity to explain our project at TRT

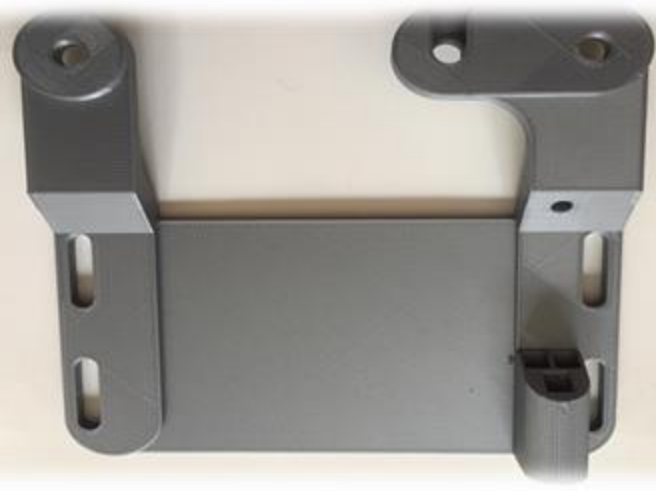


FOR A CHILD...

- A meeting was held with the representative of the 'Robotel' Association Ankara to show the prototype hand
- Result, we had the chance to make a robot hand for a child patient voluntarily



- The robot hand, which will be produced for Ecrin, was printed with another company and the assembly of the robot hand was completed





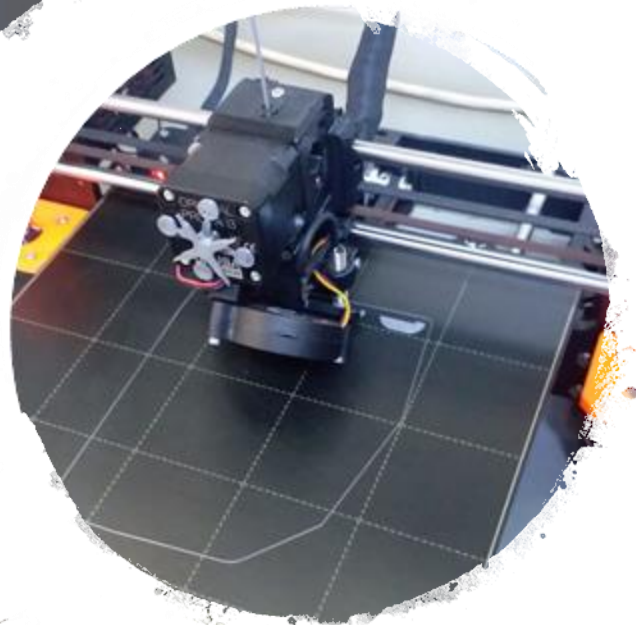
TUBITAK

- Necessary financial support has been gained from TUBITAK 2209-A University Students Research Projects Support Program
- This support will be spent on the EEG device and the necessary electronic equipment



ROBOTIC HAND CONTROLLED WITH EEG

- The robot-hand was printed , which will work with the EEG device, at the company
- Prusa i3 3D Printer

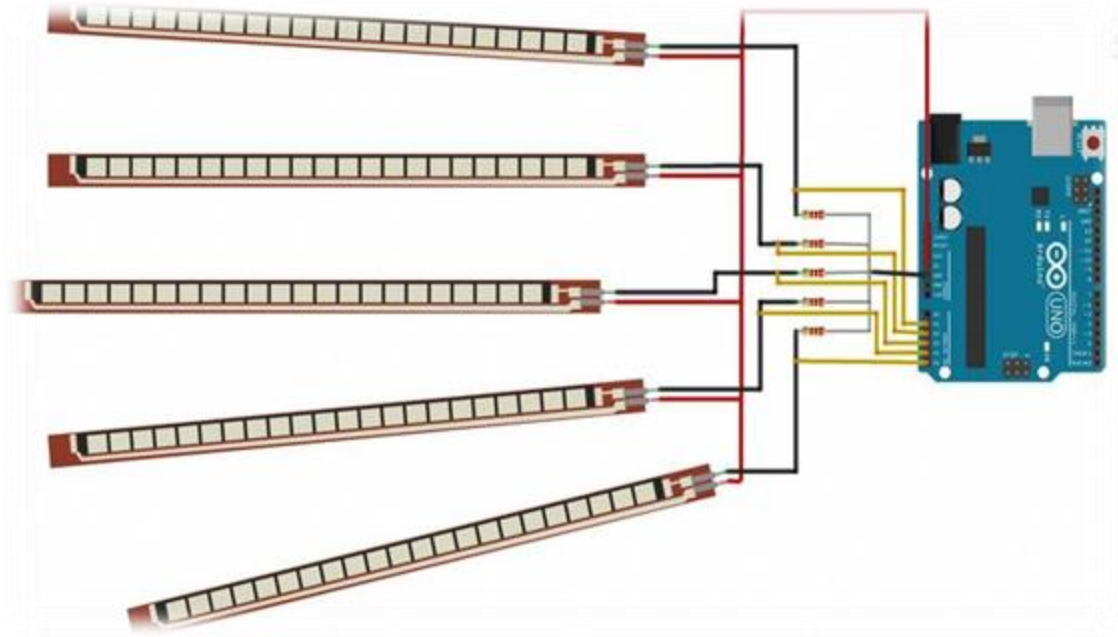




- The main filament used in the 3D printer is PLA
- PLA has a hard structure and is resistant to impacts
- But it is fragile and less flexible than TPU
- TPU, which is a flexible filament, is used in the joints

ELECTRONIC COMPONENTS AND DESIGN

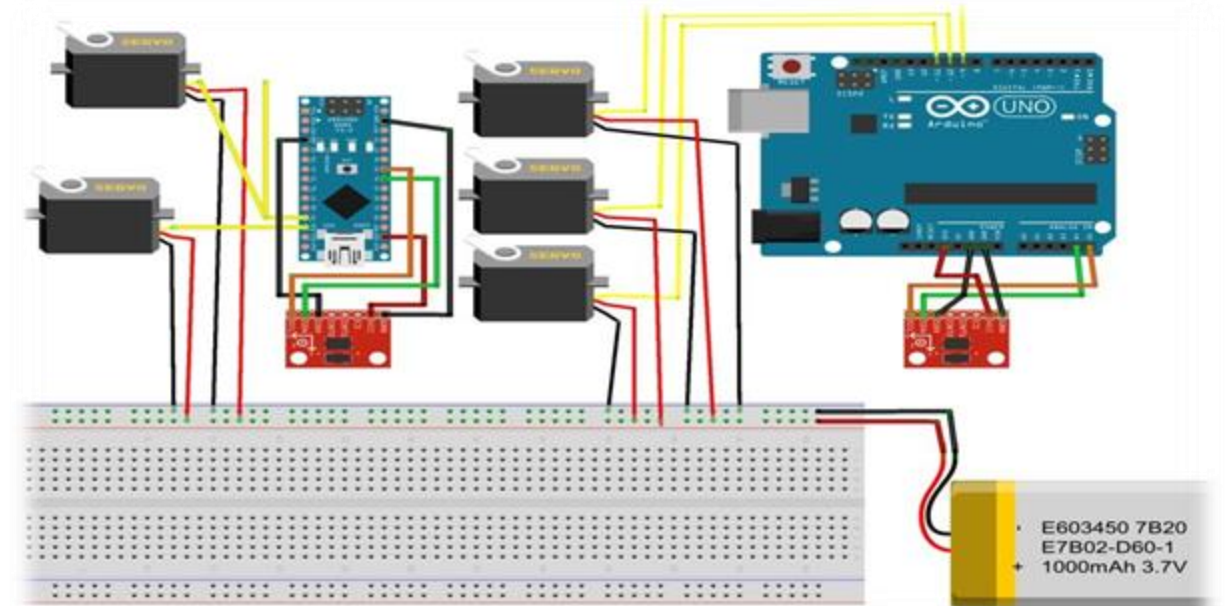
- Flex Sensor x 5
- 2.2 Kohm resistance x 5
- Servo motor x 5
- Arduinio Mega
- Arduinio Pro Mini(optional)
- Emotive Insight



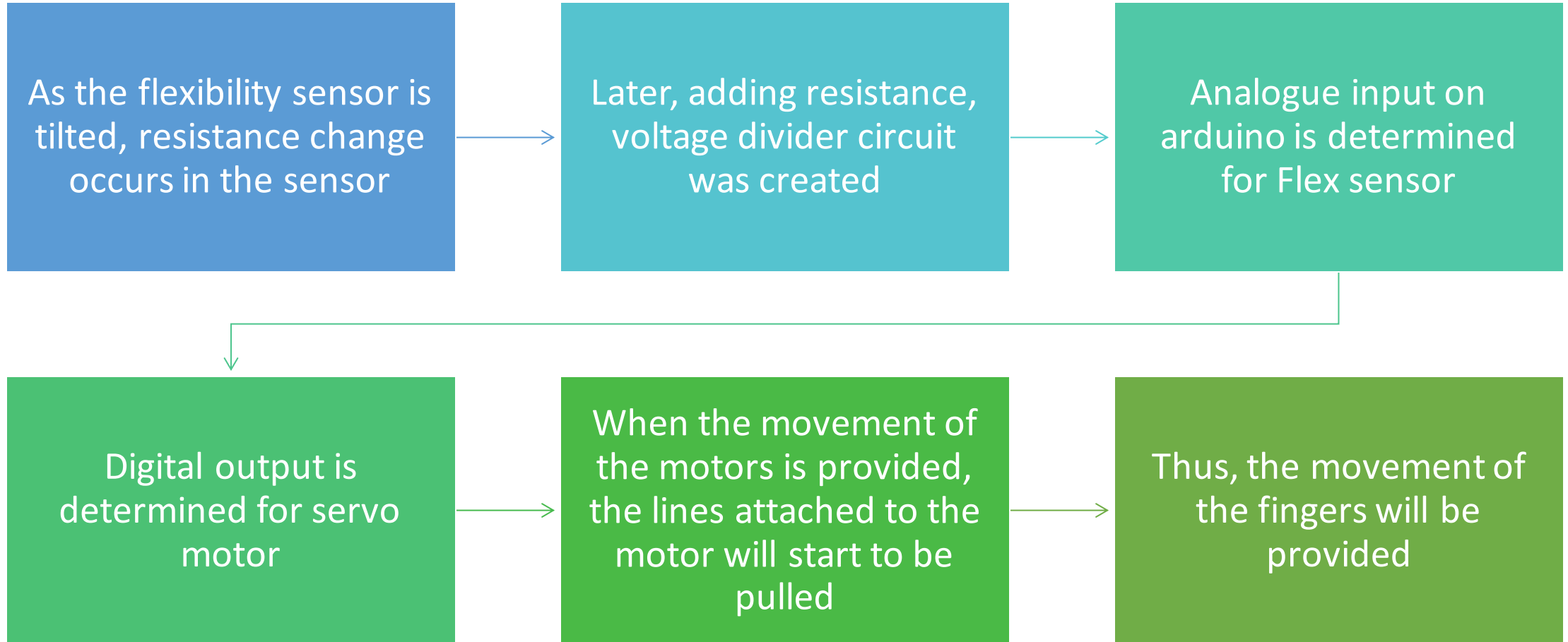
Test Hand Electronic Schema

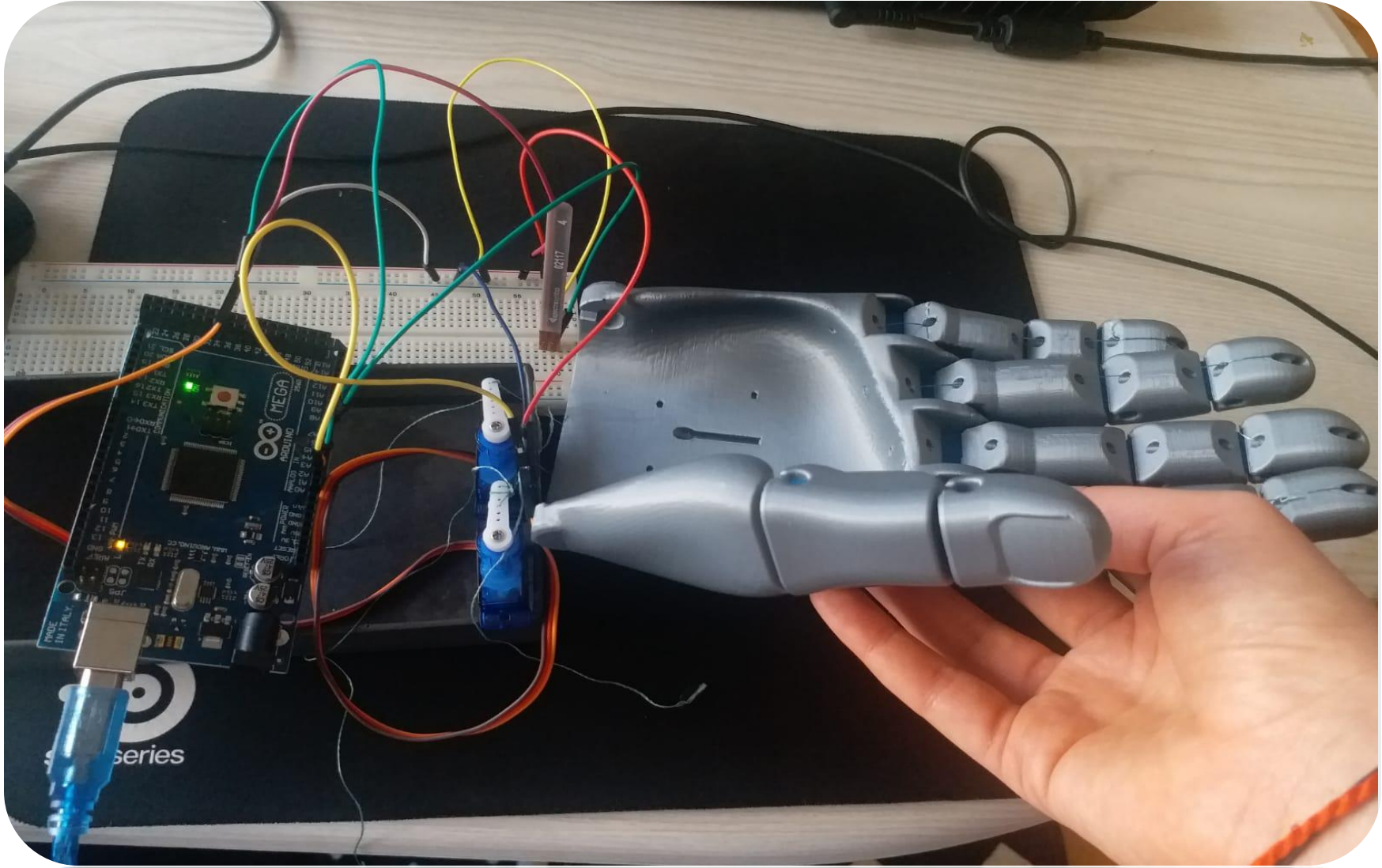
In order to check the movement capacity of the fingers

Electronic Schema of the Circuit



WORKING MECHANISM





EEG (Electroencephalography)



Emotive Insight

- In order to get EEG, the research was conducted with companies about the price and software of the device
- 5 channel wireless EEG Headset



THANK YOU