

NEPPI Workshop I

3.11.2021

Welcome!

Salu Ylirisku

Agenda

- 09:00-> Coffee available
- 09:15-09:45 Introduction to Project I – The Hex Machine (hybrid)
- 09:45-10:15 Teaming up, getting boxes, and setting up frames
- 10:15-10:30 The first challenge brief (hybrid)
- 10:30-11:15 Networking, partnering, and agreeing
- 11:15-12:00 Introducing tools, the basics of working with foamboard & tape & glue (hybrid)
- Lunch
- 13:00-14:00 Simple button and switch (more coffee!)
- 14:00-15:00 Adding motor and servo(s) to the show
- 15:00-16:00 Design Factory Tour

hexmachine

You are the builders

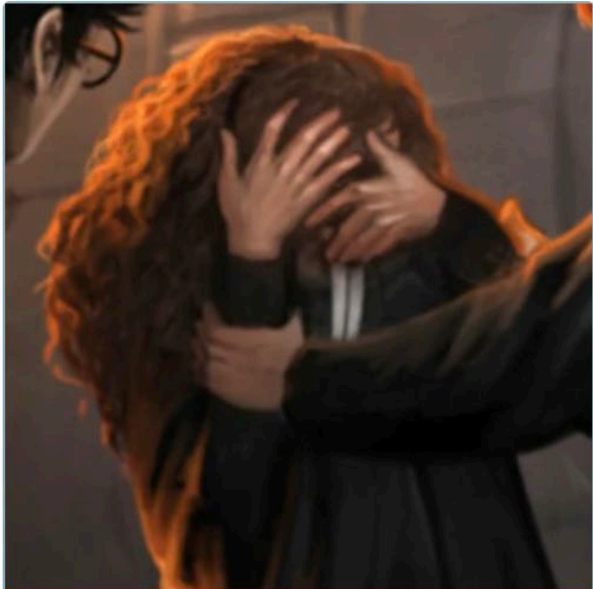
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What the Hex?



<https://harrypotter.fandom.com/wiki/Hex>



Hex	
Incantation	Varies
Type	Dark charm (moderate) ^[1]
Hand movement	Decisive and firm ^[2]
Light	Varies
Effect	Moderate suffering to the victim ^[2]
Creator	Miranda Goshawk, ^[3] Severus Snape, ^[4] Merwyn the Malicious, ^[5] etc.
[Source]	

List of hexes

	Name	Incantation	
B	Bat-Bogey Hex		Caused the target's nose to attack them.
	Bedazzling Hex		Disguises things. ^[18]
C	Confusion Hex		Impaired foes by wounding them, making them more vulnerable to other attacks.
D		<i>Densaugeo</i>	Grotesquely elongated.
	Deterioration Hex		Impaired foes and their equipment.
H	Horn tongue hex		Turned the target's tongue into a horn.
	Hurling Hex		Caused a broomstick to fly out of the target's hands.
I	Illegal growth hex		Caused a target's head to grow.
	Impediment Hex ^[26]	<i>Impedimenta</i> ^[27]	Slowed down the movement of the target.

Hexadecimal

From Wikipedia, the free encyclopedia

"Sexadecimal" redirects here. For base 60, see [Sexagesimal](#).

"Hex digit" redirects here. For binary coded hexadecimals, see [Nibble](#).

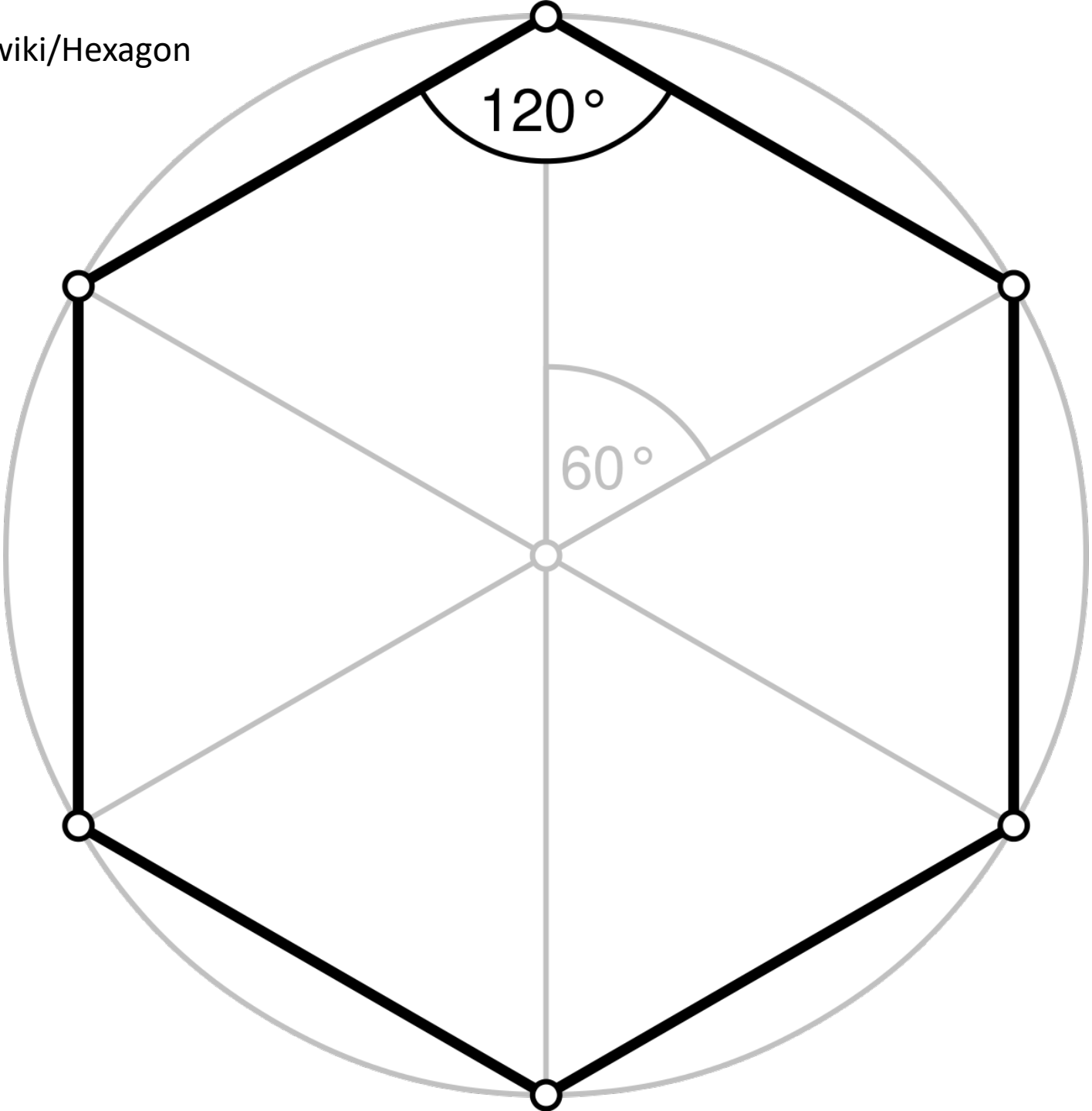
"Hex format" redirects here. For hexadecimal file formats, see [Hex file \(disambiguation\)](#).

In [mathematics](#) and [computing](#), the **hexadecimal** (also **base 16** or **hex**) numeral system is a [positional numeral system](#) common way of representing numbers using 16 distinct symbols, most of which are letters of the alphabet (the letters "a"–"f") to represent values from 10 to 15.

Hexadecimal numerals are widely used by computer system designers and programmers because each hexadecimal digit represents four [bits](#) (binary digits), also known as a [nibble](#) (or nybble), which is 1/2 of a [byte](#). The hexadecimal representation of a byte, which can be conveniently represented as 00 to FF in hexadecimal.

In mathematics, a subscript is typically used to specify the base. For example, the decimal value 255 and 255₁₆ are used to denote hexadecimal numbers, usually involving a prefix or suffix. The prefix `0x` is used to denote hexadecimal numbers in programming.

Hexadecimal is used in the transfer encoding **Base16**, in which each byte of the [plaintext](#) is broken into two hexadecimal digits.

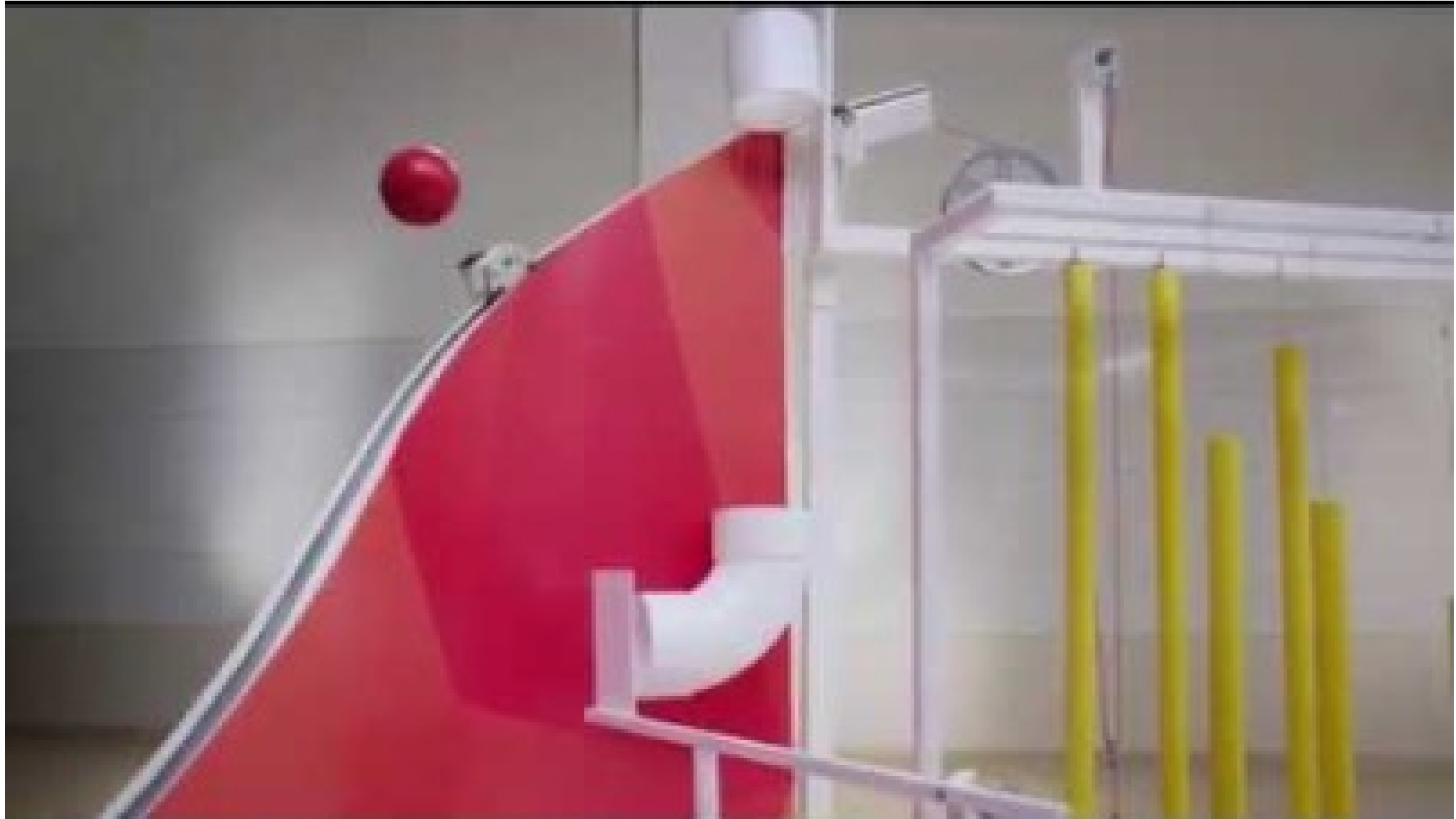




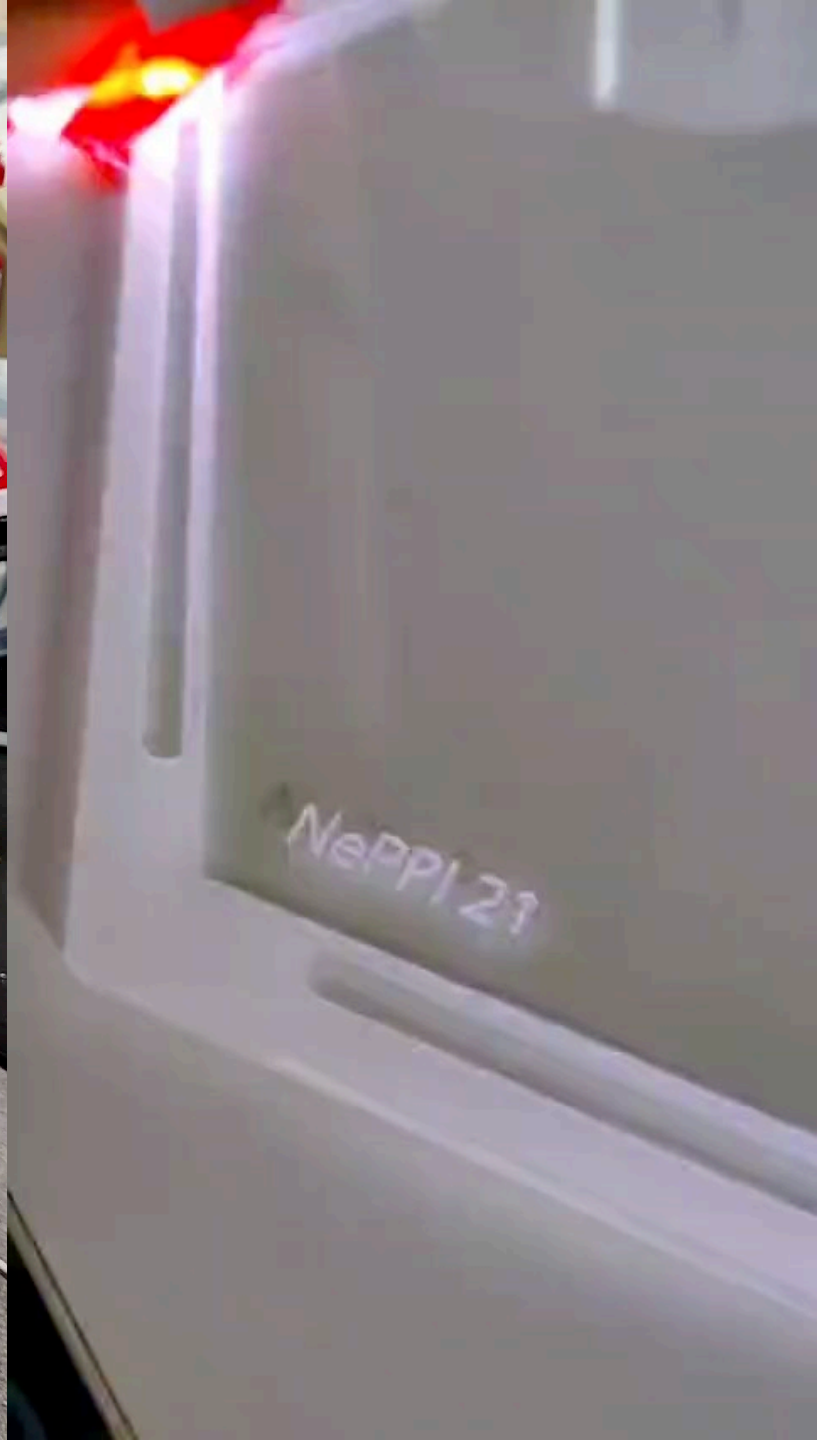
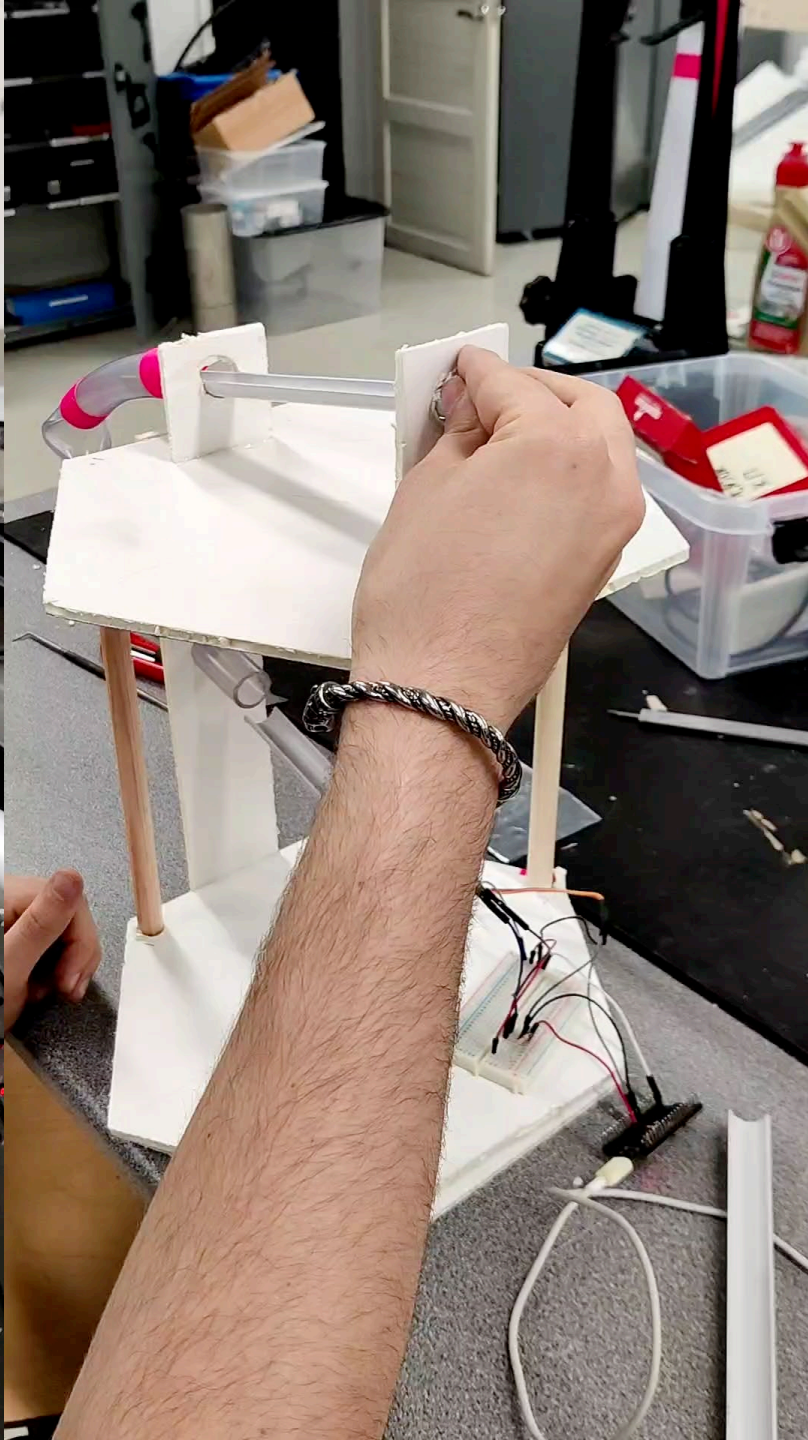
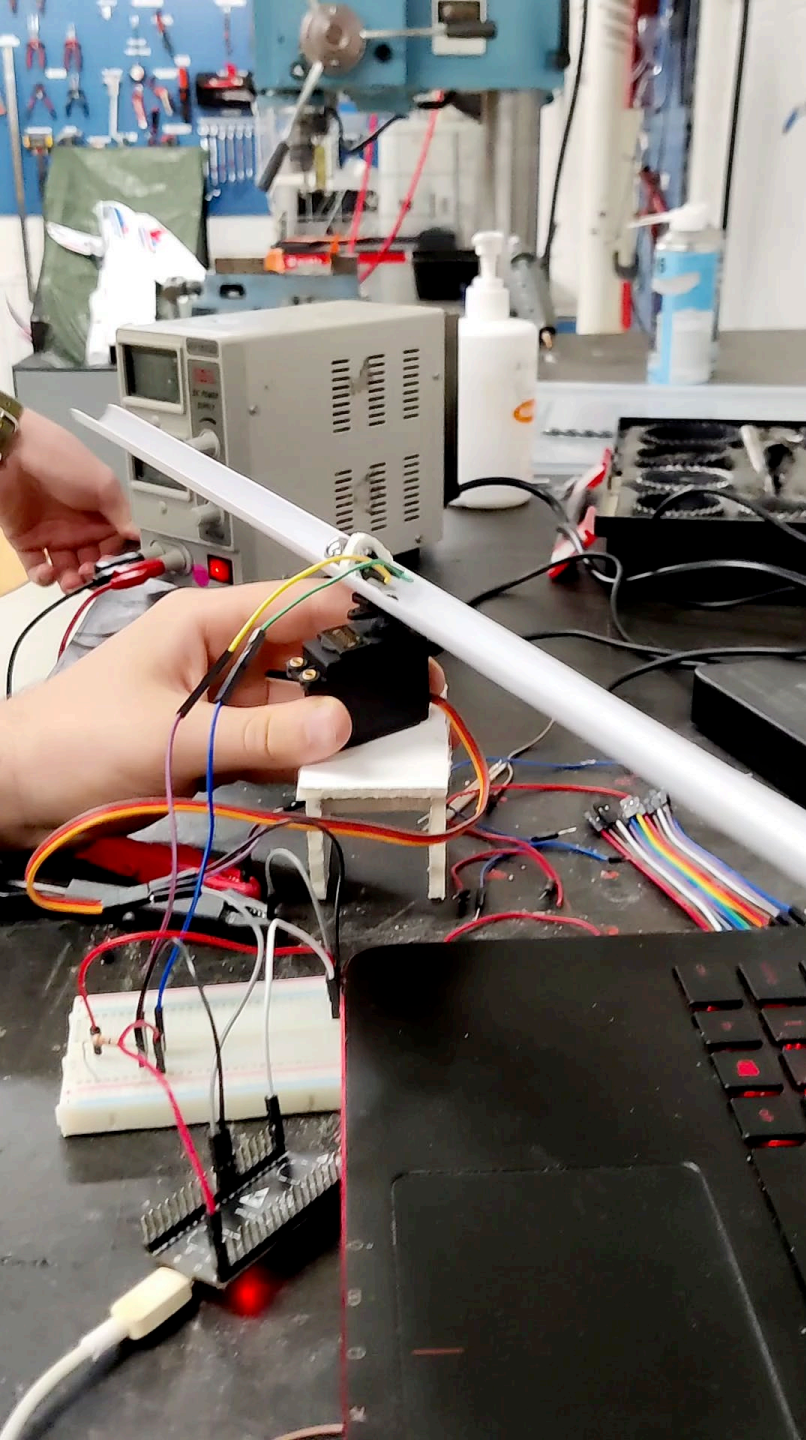
Long Summer

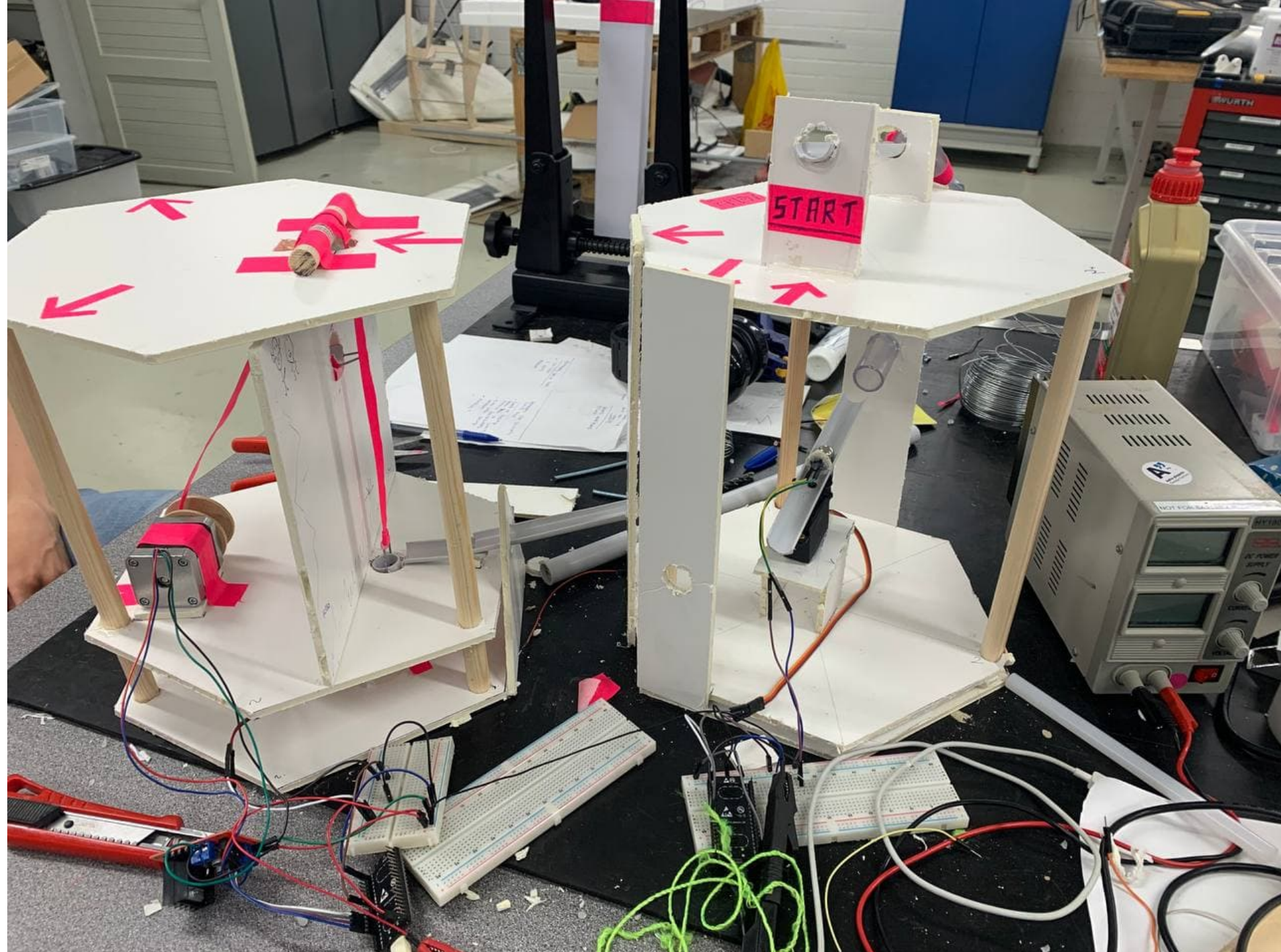
Inspiration

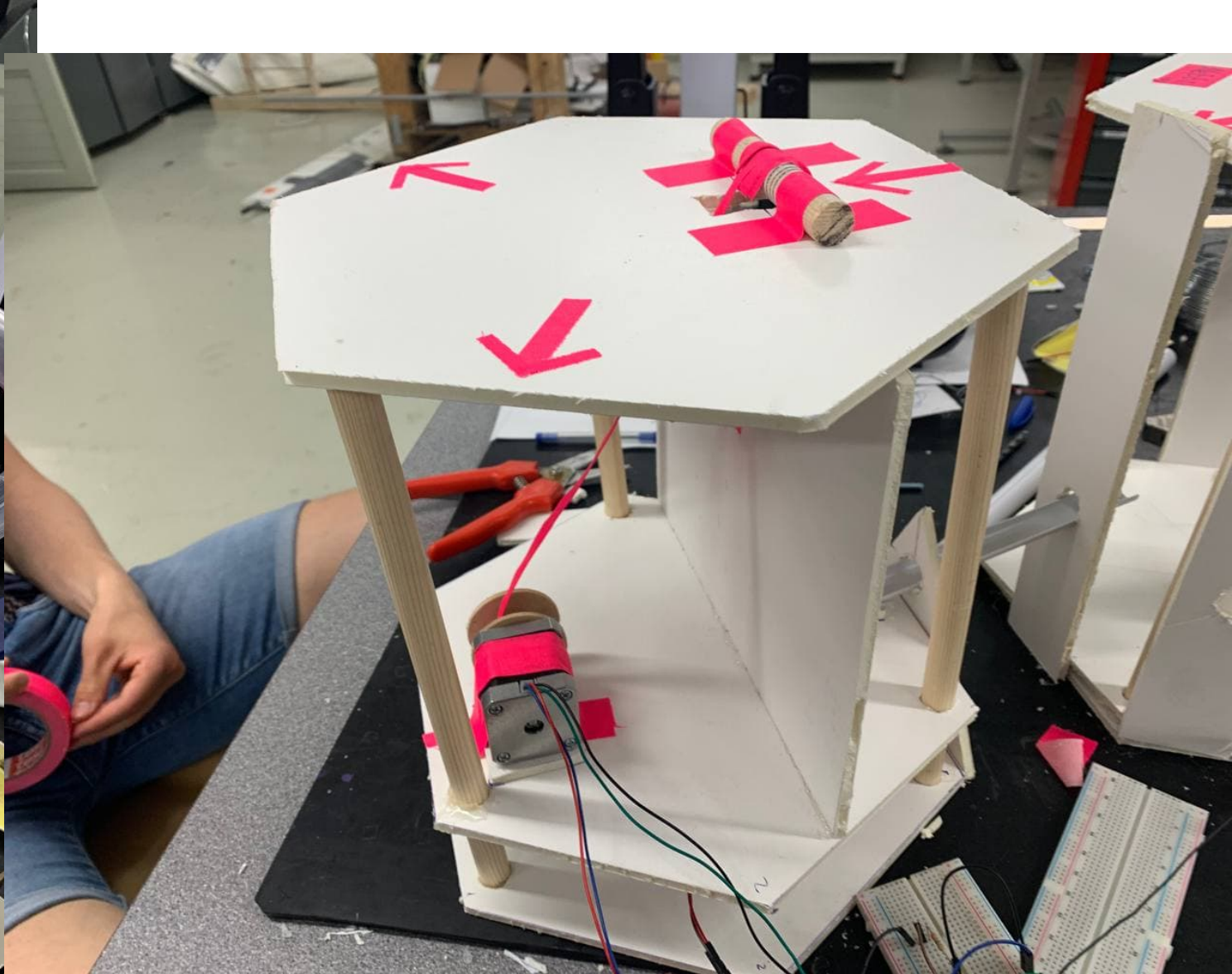
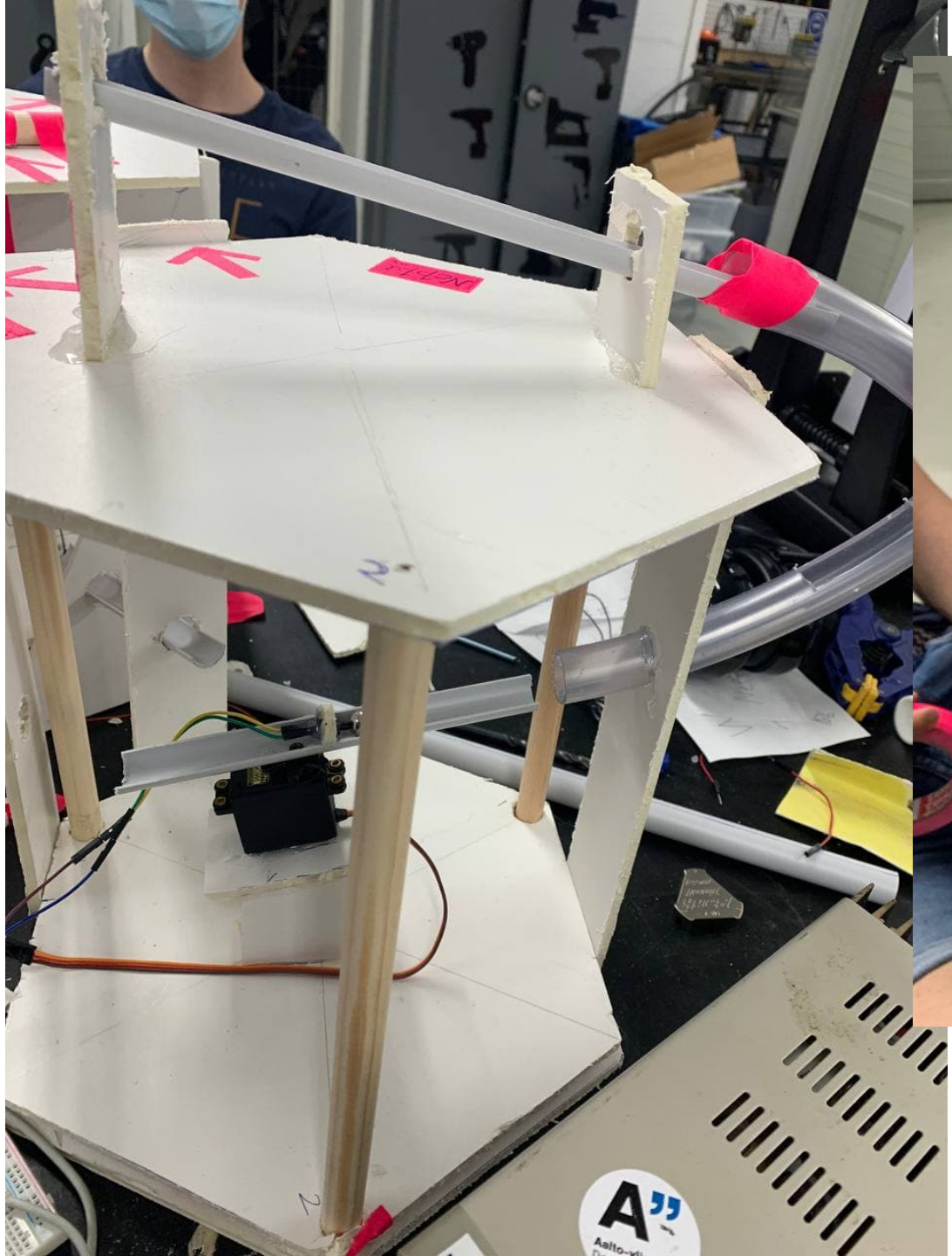
Rube-Goldberg machine

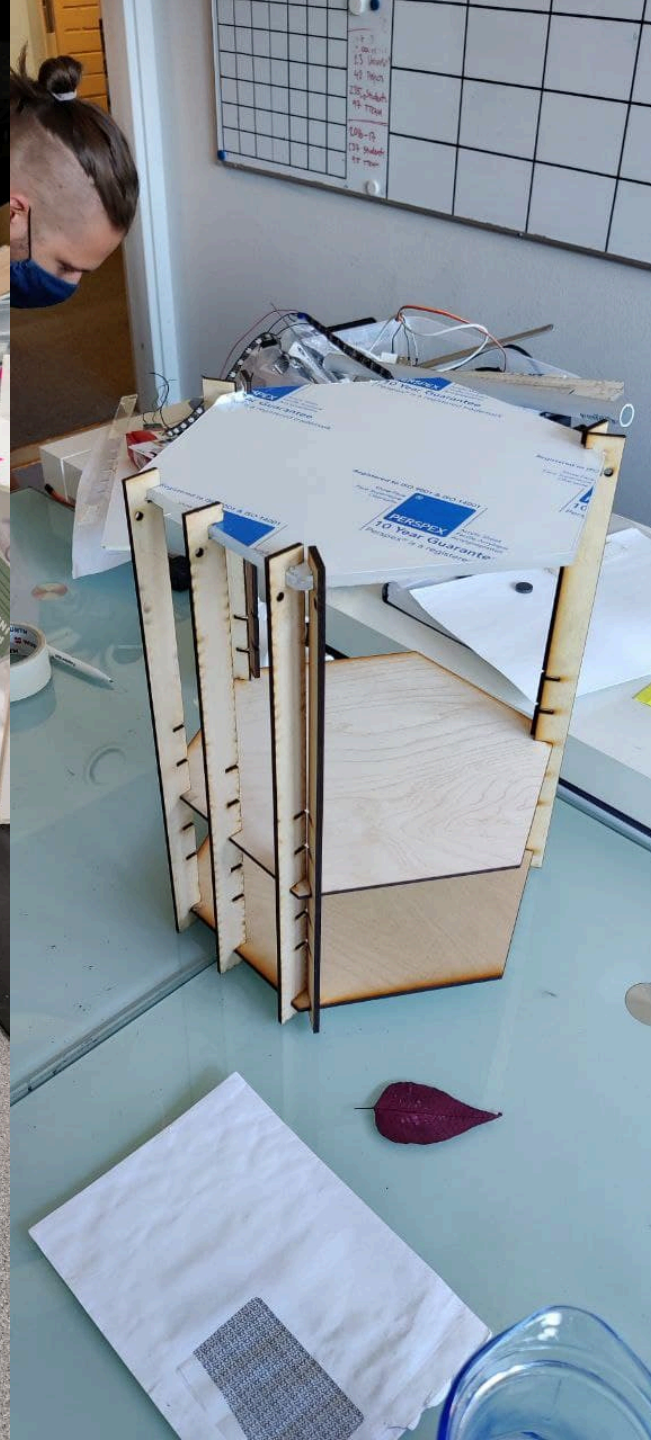


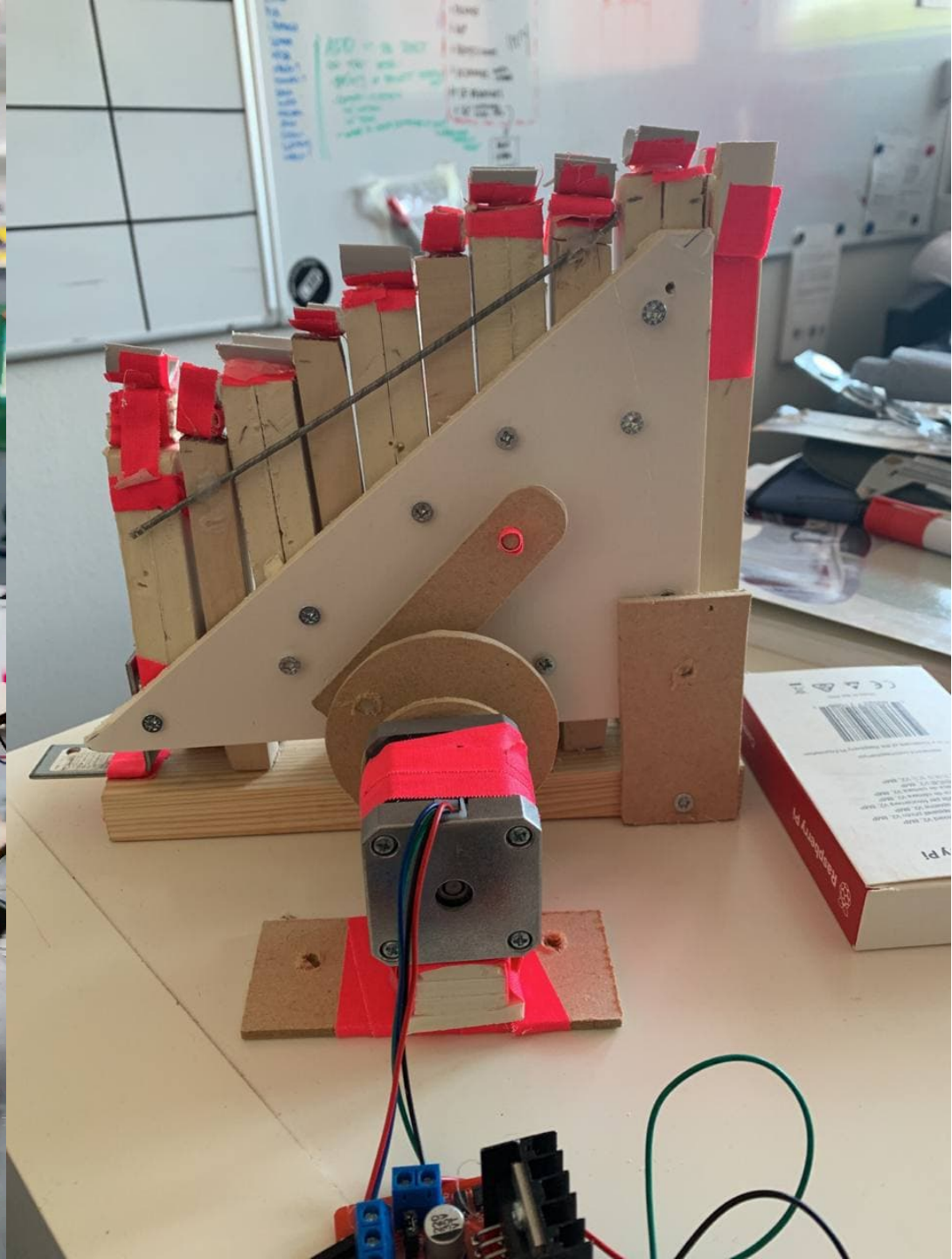
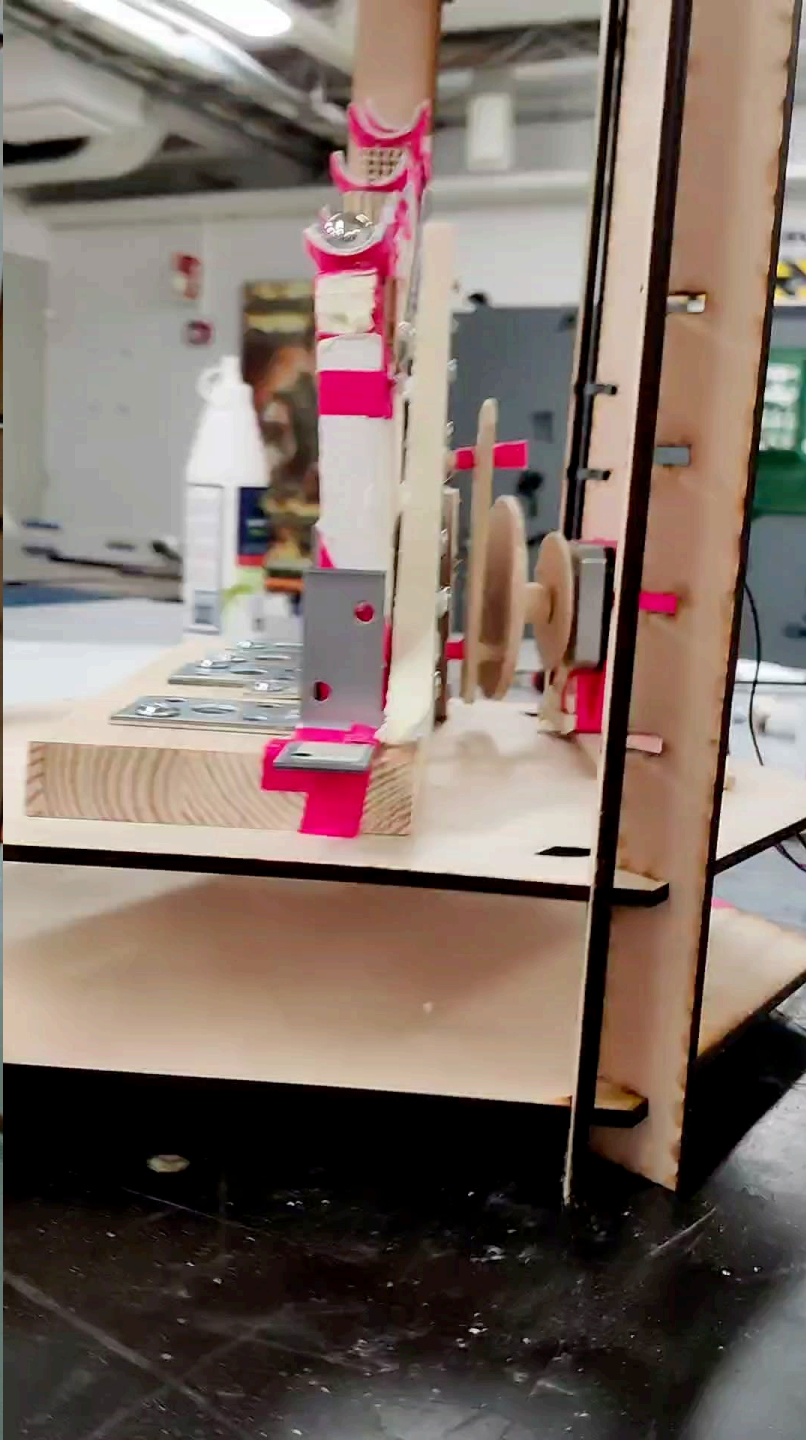
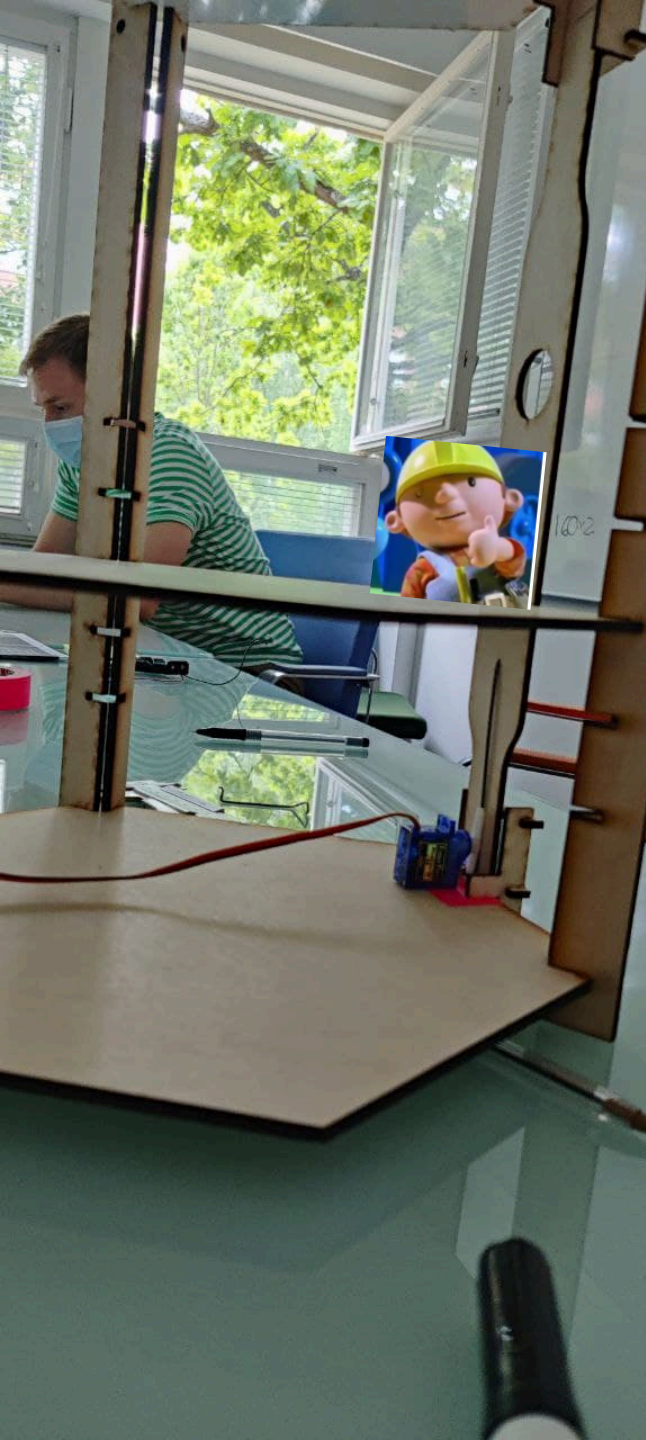
Useless machine

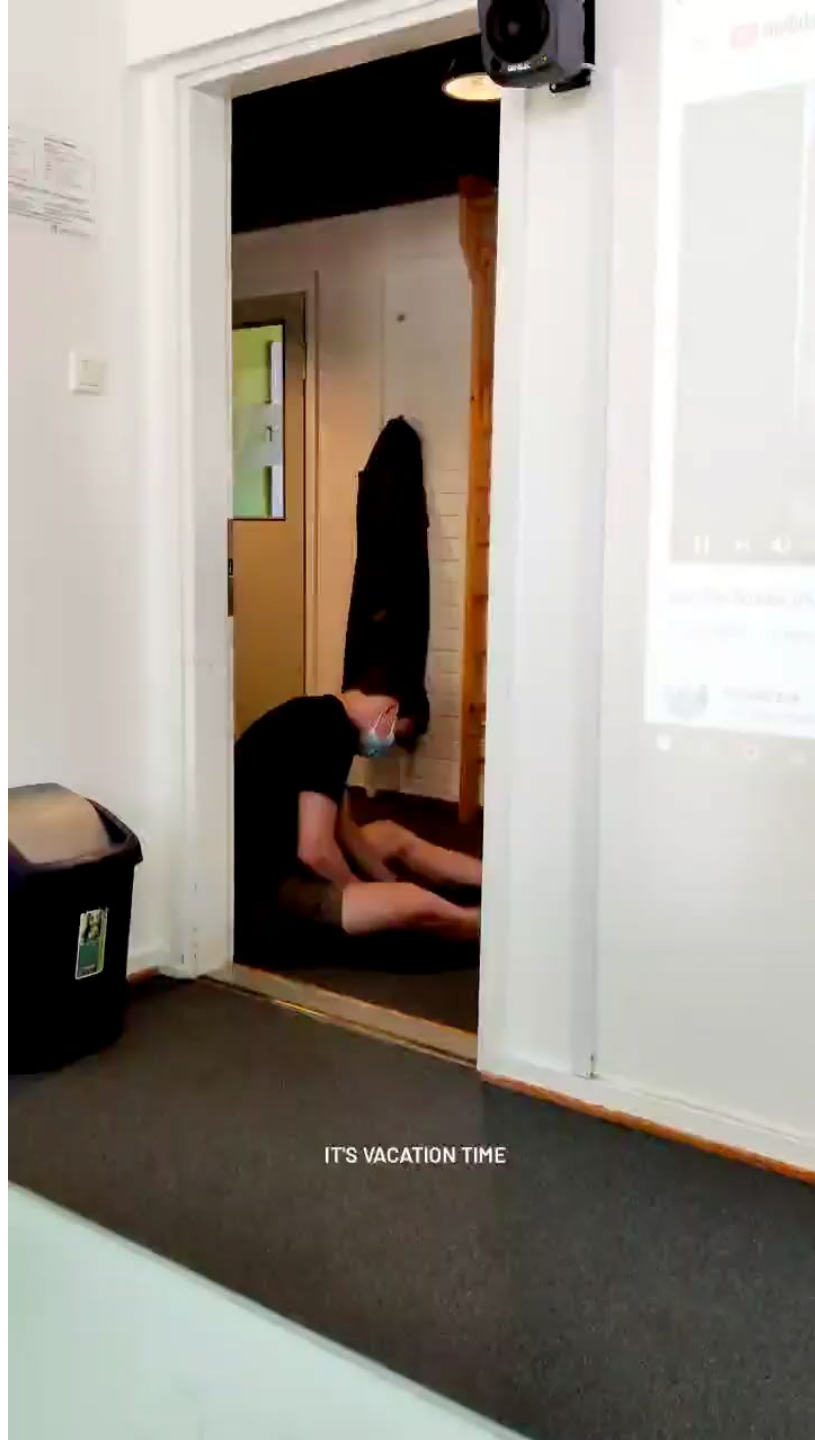
















A white cloud shape with a thin white outline, containing the text 'IoT' in white. The cloud is positioned in the upper center of the image, overlapping a blue background with a hexagonal pattern.

IoT

hexmachine

You are the builders

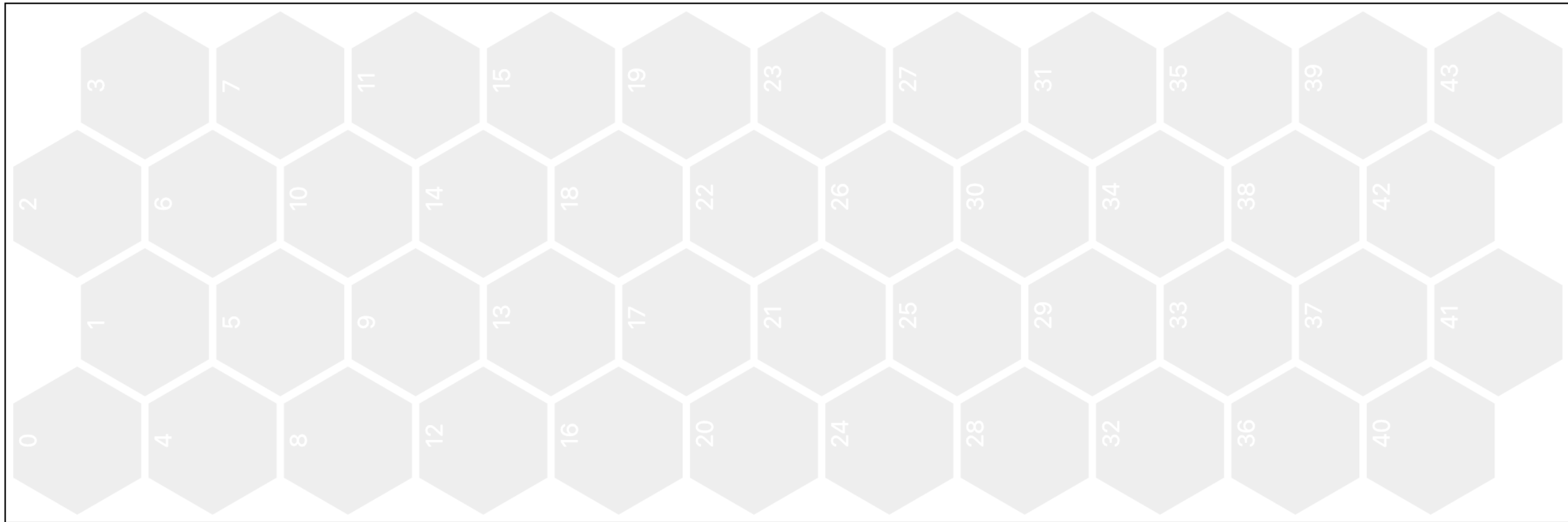
Learning goals

- Hands-on experience with **low-fidelity prototyping** materials and electronic components.
- Hands-on experience of **iteratively** building an IoT device that functions physically in a local setting while interacting with an online service.
- Concrete experience of how IoT devices are built of physical and interactive **components** of different kinds.
- Know that IoT devices always network through **specific interfaces**.
- Know that IoT services are typically built on **specific platforms**.
- Know that there are **many ways** of achieving the same result in order to satisfy requirements.

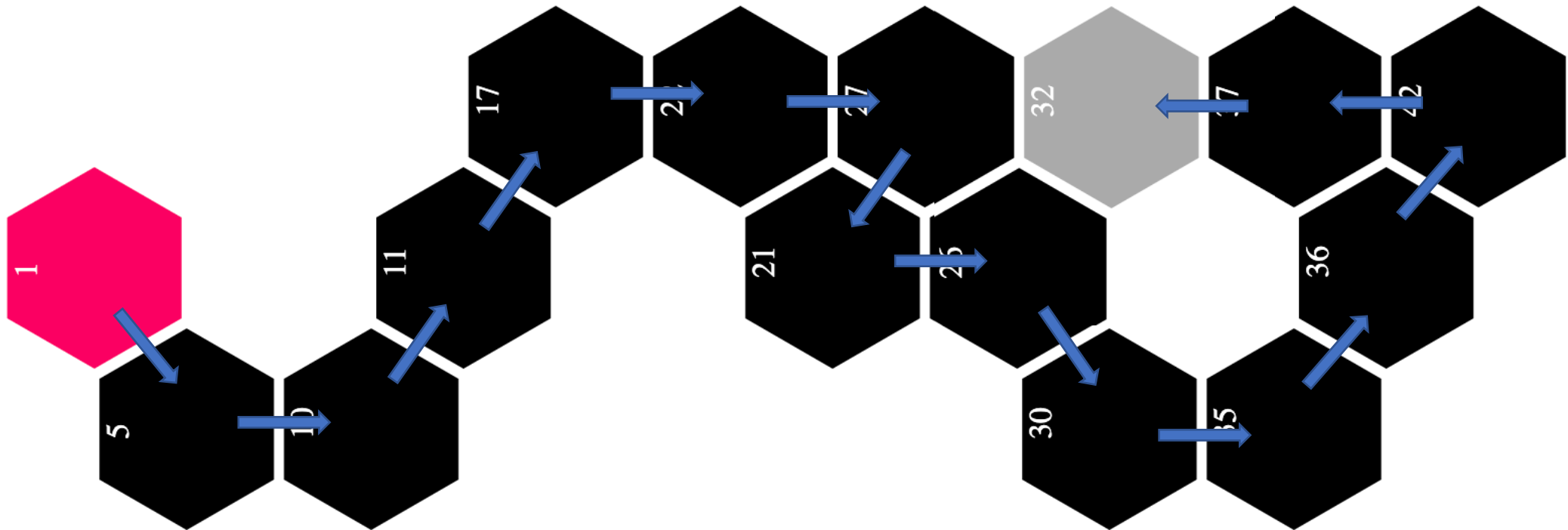
Hex Machine - Rules

- Two rounds
 - The long path = Challenge I
 - The dynamic path = Challenge II

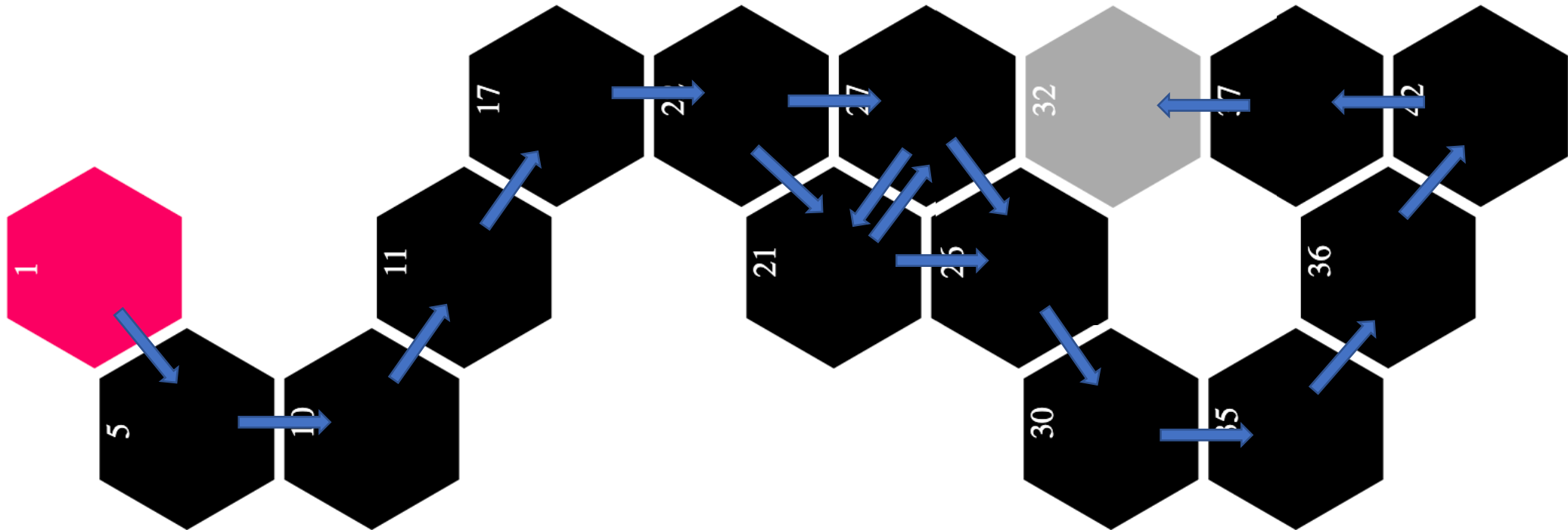
The hex table



Challenge one – Long path



Challenge II – Dynamic path



Schedule – Two parts

Part I:

- Building a complex IoT machine with given design requirements
- Event: Show on 12th of November in Väre (13:00-13:30)

The IoT machine project grading

- Active participation, 50 %
- Functional result, 40 %
- Wow effect, 10 %

The absences are taken into account – and in doubtful cases, I will be kind 😊

Teaming up!

The teams

1. BIZ: Milo Sillanpää, Emmi Laine, Huong Tran
2. CHEM: Mats Silen, Veera Kallio, Hazal Ustabas
3. BIZ: Vilma Torkkeli, Klara Norri, Felix Gugler
4. BIZ: Maria Uusitalo, (Oskar Sasse), (Ia Ahl)
5. BIZ: Assi Kivistö, Jasmin Elkordy, Ulrika Ura
6. ARTS: Matias Rinne, Thao Dang, (((Pauliina Alanen)))
7. ARTS: Matias Seppälä, Sofia Nissilä, Arla Aalto
8. ENG: (Antti-Mikael Kaljunen), ((Titta Kanerva)), ((Utshav Bhattarai))
9. CHEM: Cedric Ehrnroot, Balder Eklöf Eira, Emilia Tognetty
10. ARTS: Yen Hoang, Milla Rusanen, Samvidh Ramanathan
11. BIZ: Marius Augustin, (Sofia Wasastjerna), (Laura Suomalainen)
12. ARTS: Nikolas Kirstovic, Stanislav Malevich, Nicole Hussmann
13. SCI: Oula Airiola, Yujie Shen, (Hleu Le)
14. SCI: Joel Oksanen, Lara Render, (Lucas Wasama)
15. ELEC: Hechukwudere Okoroego, Antti-Juho Nieminen, (Aaro Vasama)

The boxes

- The frame
- Some components (servos / stepper motors)
- Continuing @10:40

The first challenge

- Build one long path as a class, electronics optional
- The path will be tested on Friday at 12:00

Networking and partnering – making an agreement

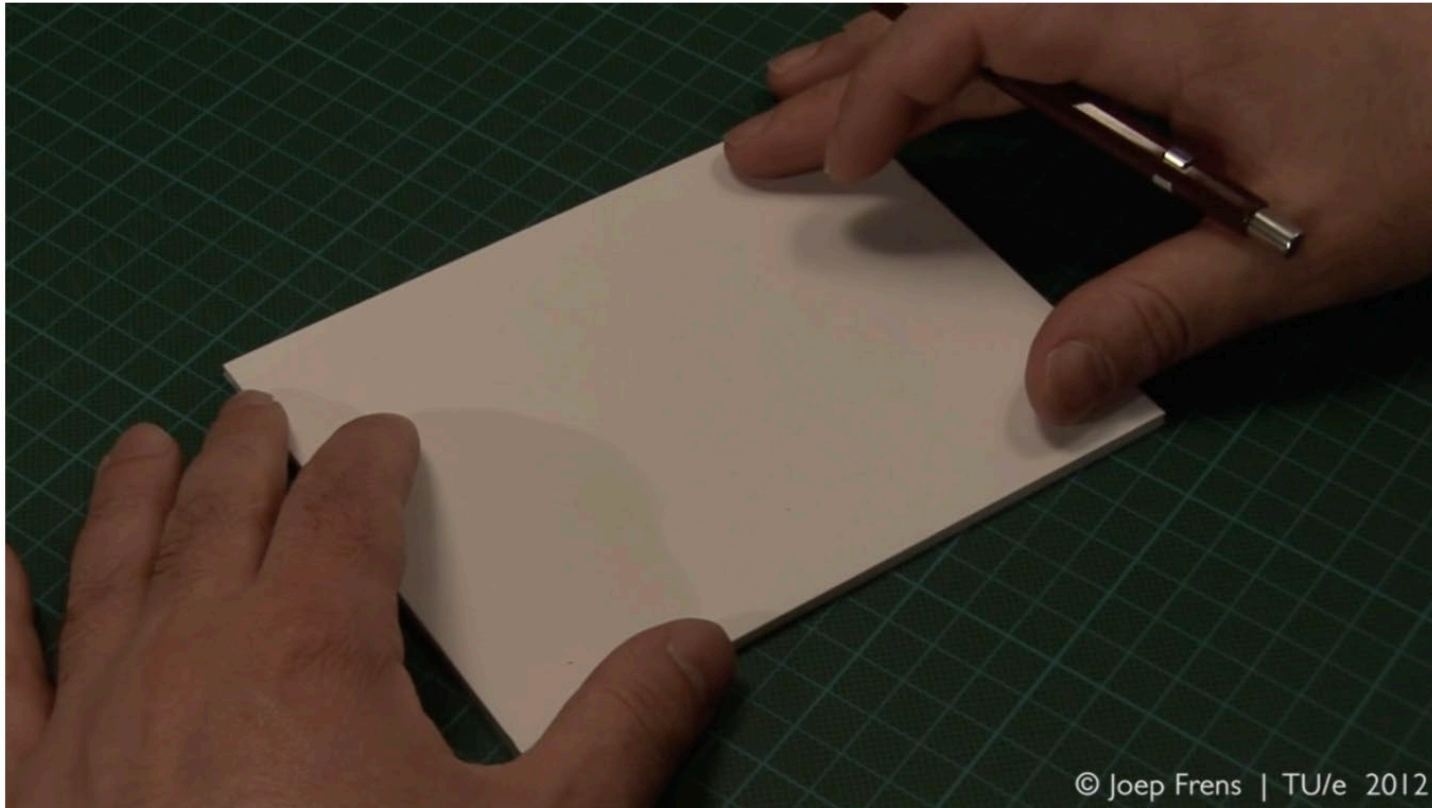
- Which hexagon modules are going to be your neighbors?
- How are you going to interface with them, i.e., which holes are used as inputs and outputs – and how the ball is expected to move?
- Be ambitious but kind to yourself – more partners = more complexity

The tools – foamboard etc.

<https://mycourses.aalto.fi/course/view.php?id=32946§ion=1>

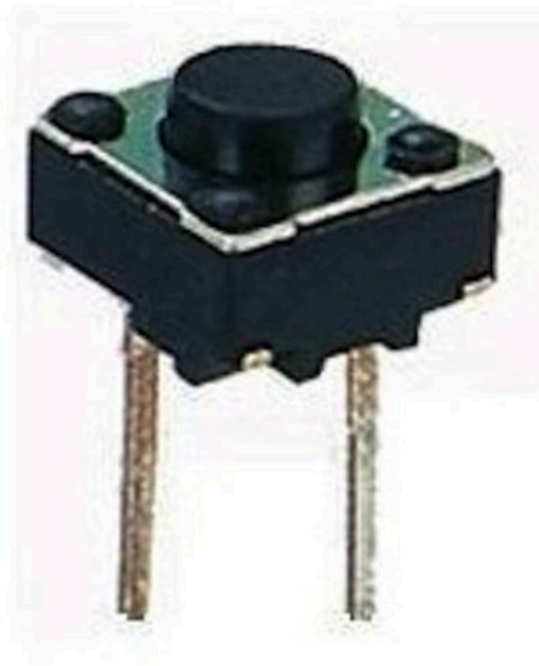
The basics

Working with scalpel and foam board



Lunch 12-13

Simple button / switch



Motor and servos



Servos have a limited range, i.e., cannot turn very long into one direction before stopping.

Steppers can run continuously, so, you can, e.g., use them to drive continuous wheels.