Talent Mobility Program 2024

Cable Driven Parallel Robots with unknown Anchor Points

Basics

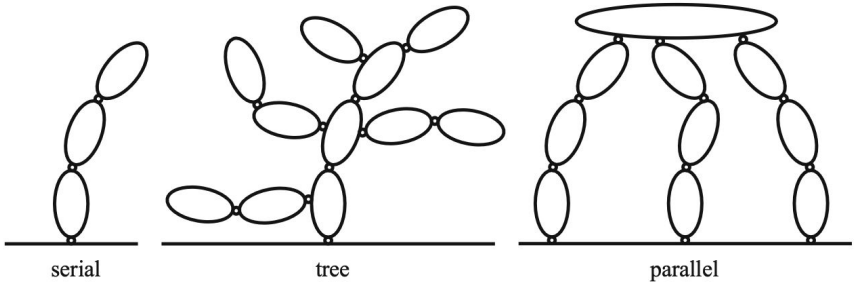


Fig. 1.2 Comparison between the topological structure of serial, tree, and parallel robots

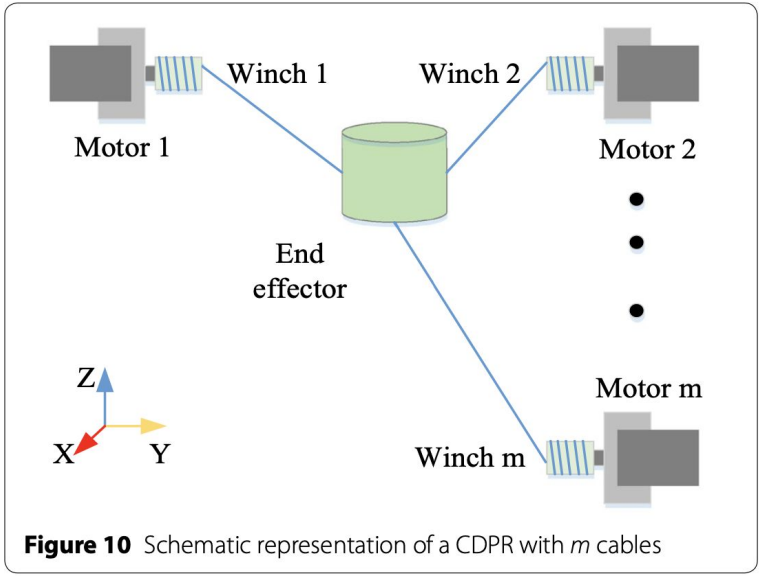
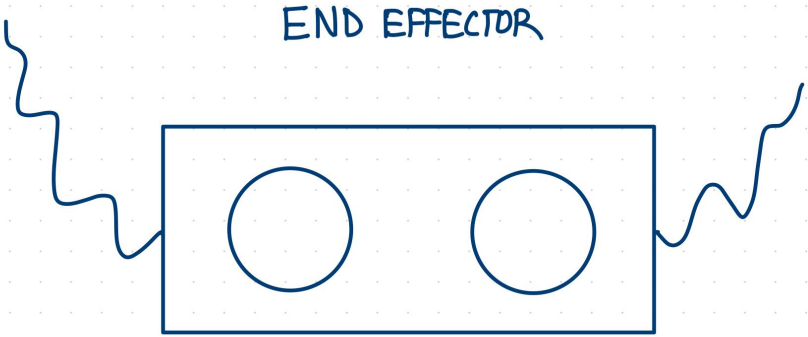
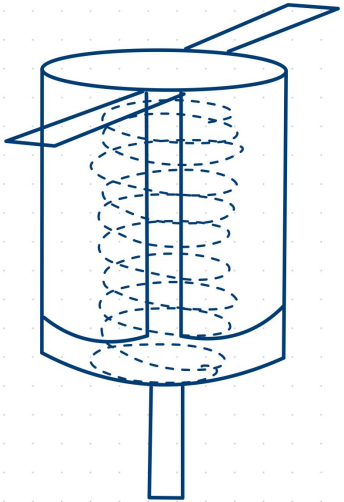


Figure 10 Schematic representation of a CDPR with *m* cables

Scope

- End effector
- Projectile Launcher





End Effector

- Drawings
- Shaft Design : Stress concentration

Mechanical Design

- ROS : Nodes used
- Python : as a programming language

Software and Code

Putting all together

Hardware used

- Dynamixel AX 12 motors
- Raspberry pi 4b
- INA260 power sensor
- TCA9548A I2C multiplexer

Theories

- Motor theory

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End Effector

- Drawings
- Shaft Design : Stress concentration

Mechanical Design

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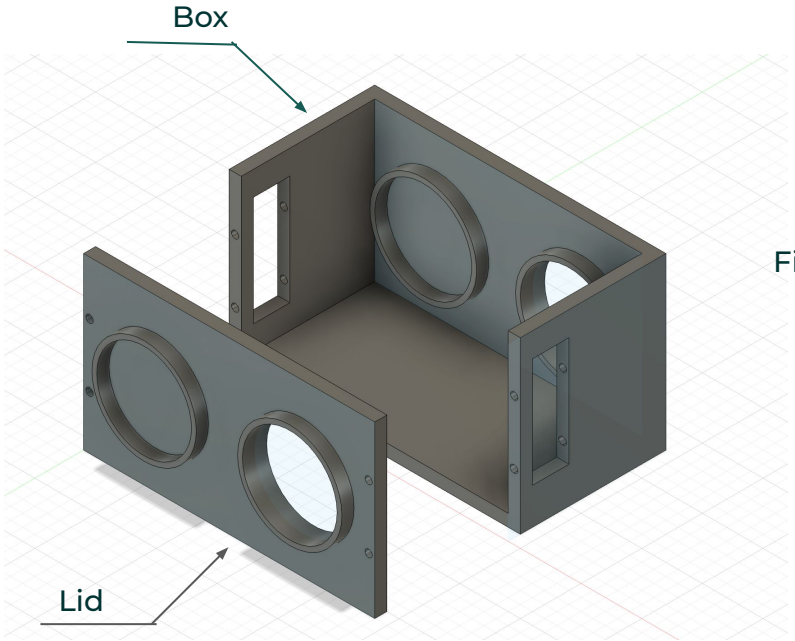
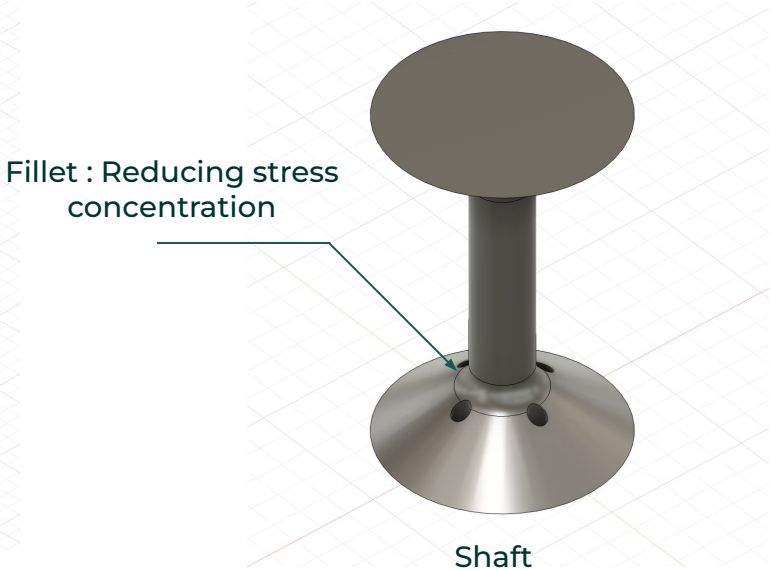
End Effector

Mechanical Design





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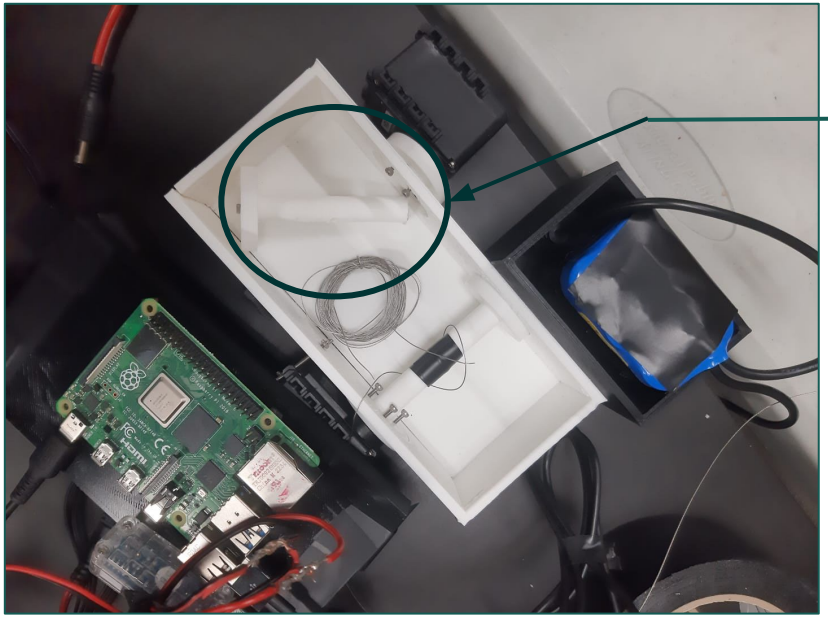
End Effector

Mechanical Design



Breakage due to Stress concentration

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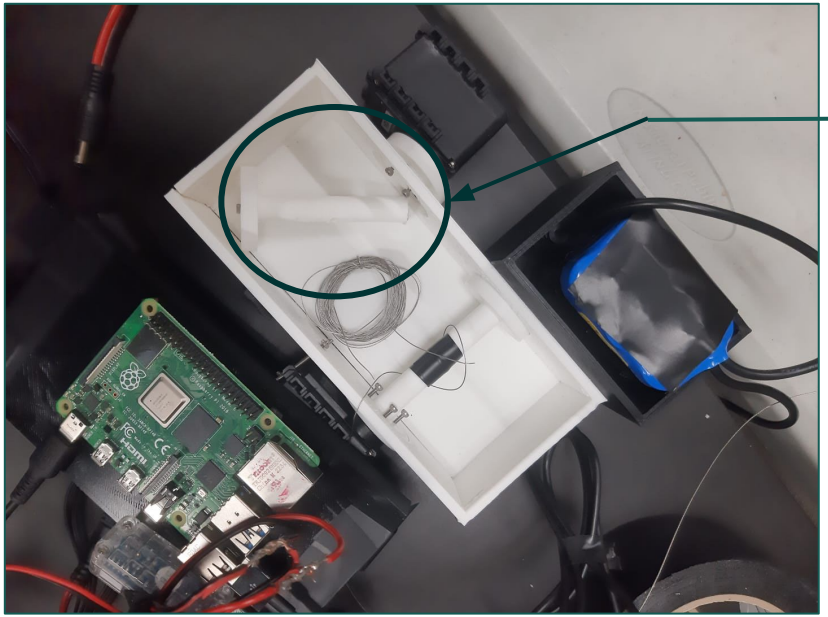
End Effector

Mechanical Design



Breakage due to Stress concentration

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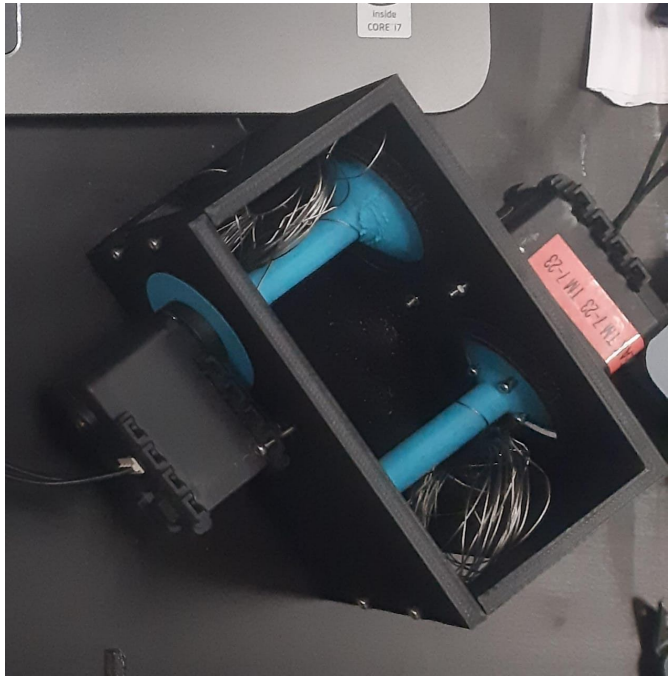
End Effector

Mechanical Design



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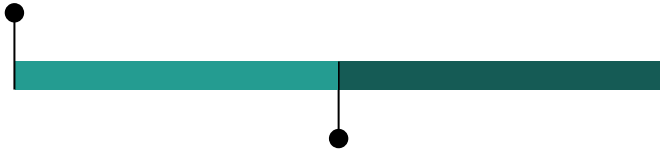
End Effector

- Drawings
- Shaft Design : Stress concentration

Mechanical Design



Hardware used

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- INA260 power sensor
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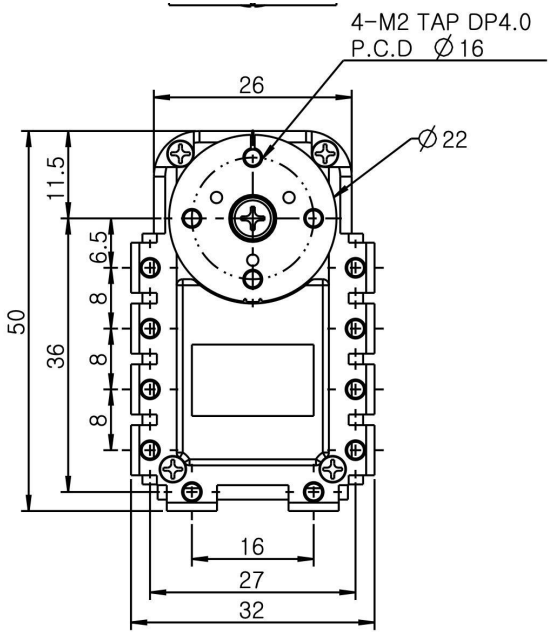
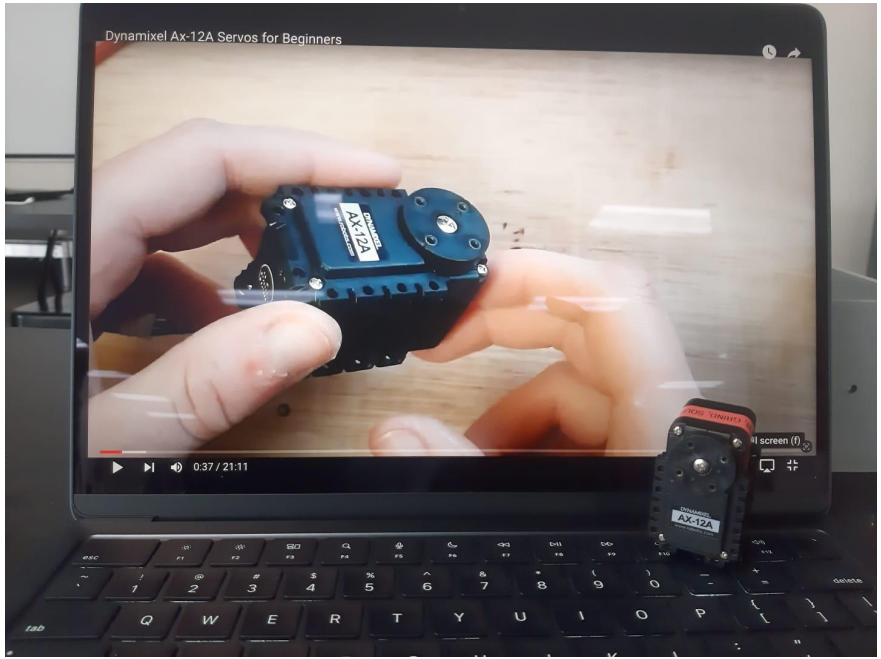
End Effector

Hardware used :





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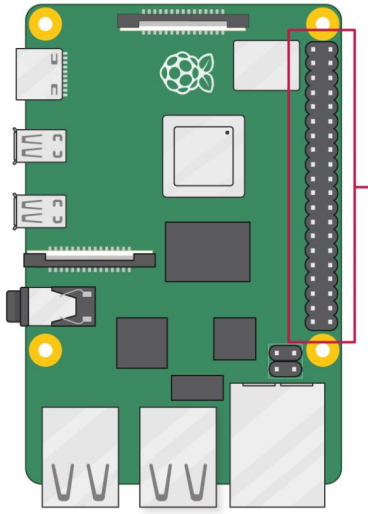
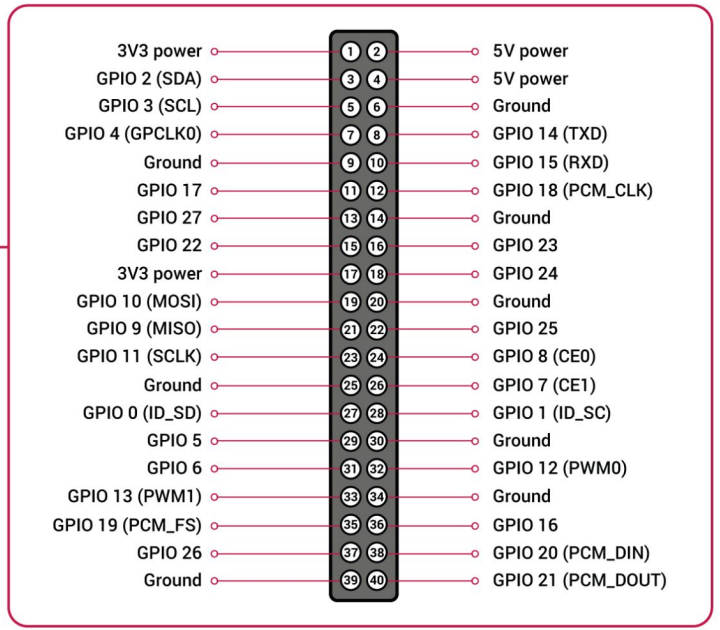
End Effector

Hardware used : *Raspberry pi 4b*





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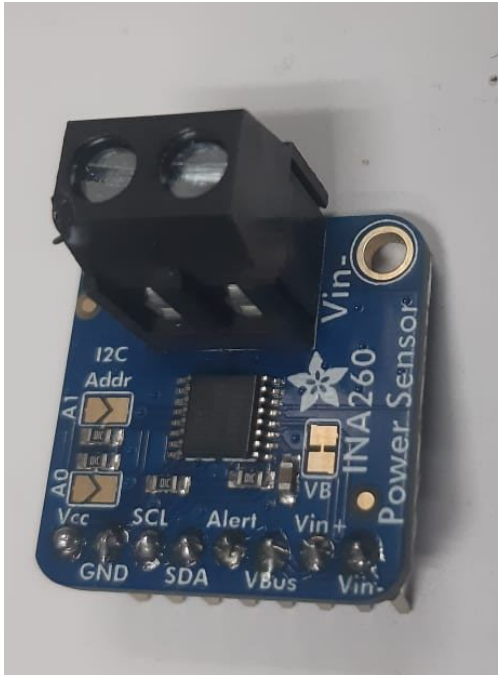
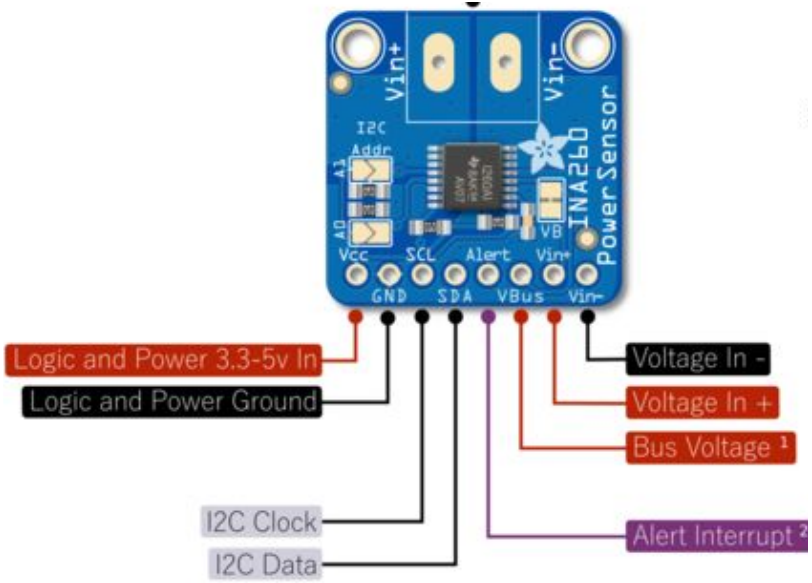
End Effector

Hardware used : *INA260 power sensor*





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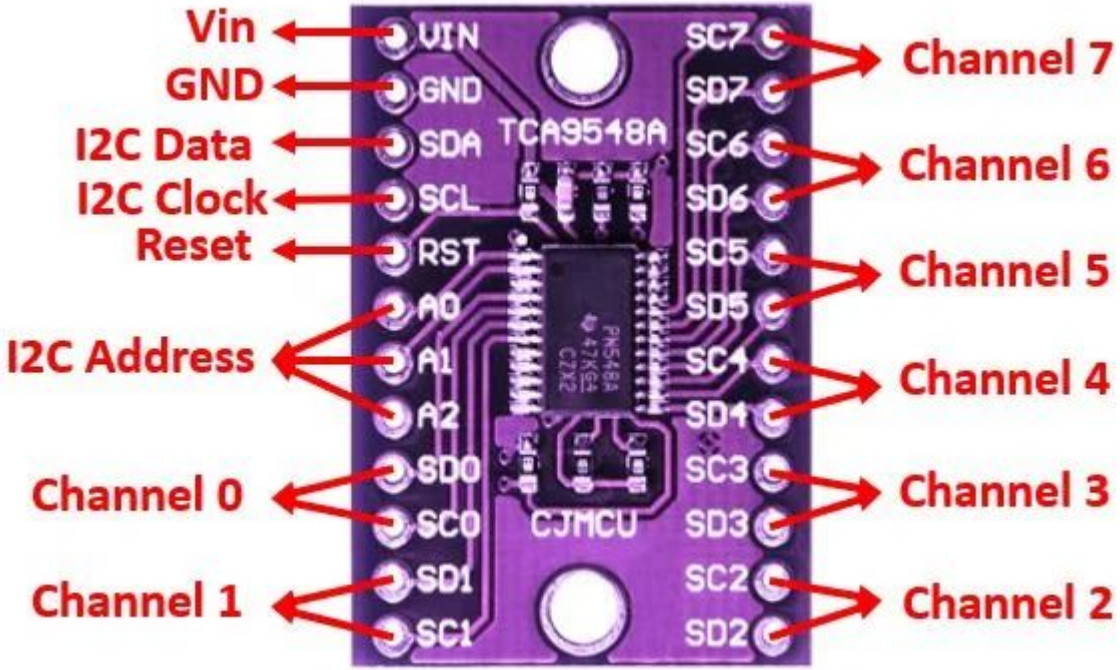
End Effector

Hardware used : *multiplexer*



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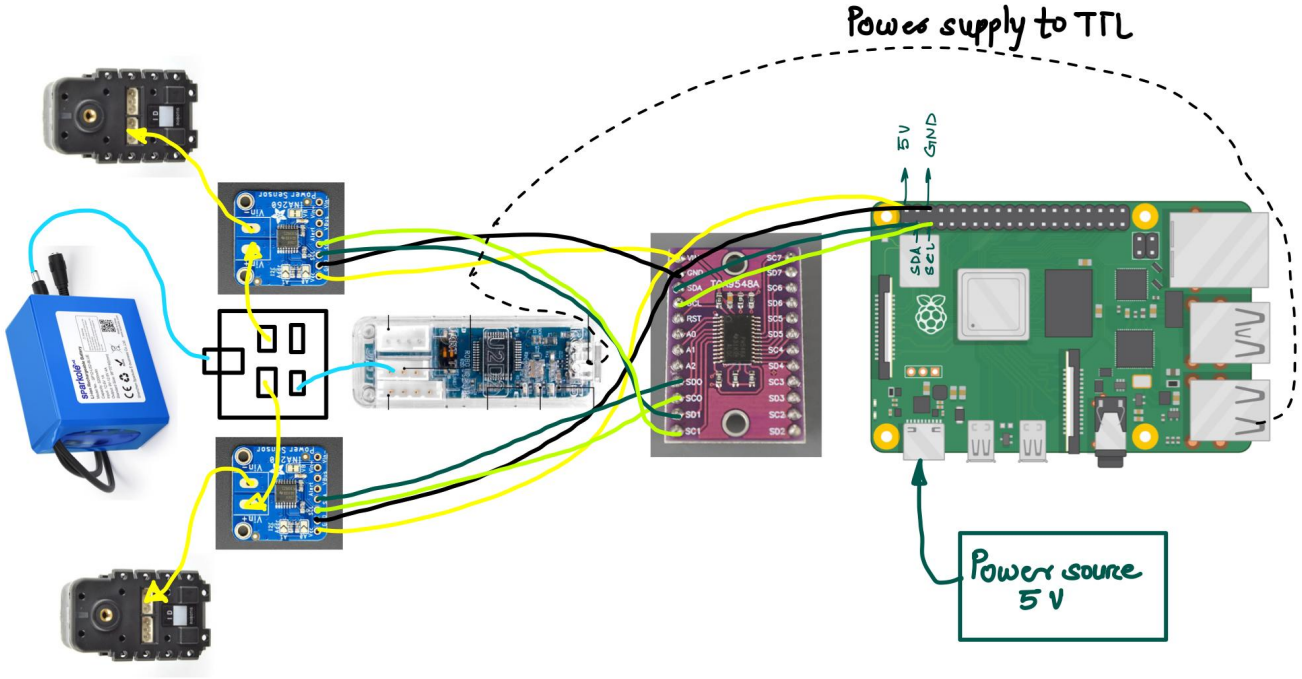
End Effector

Hardware used



End Effector

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Mechanical Design

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Software and Code

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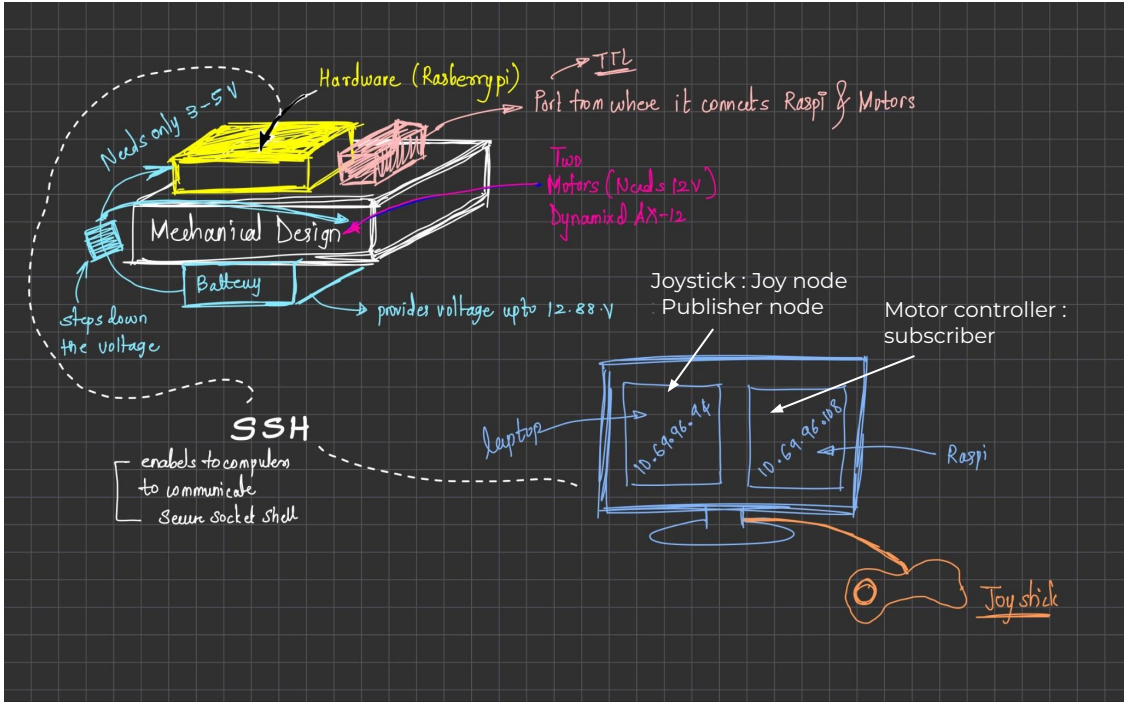
End Effector

Software : code used : *Communication*



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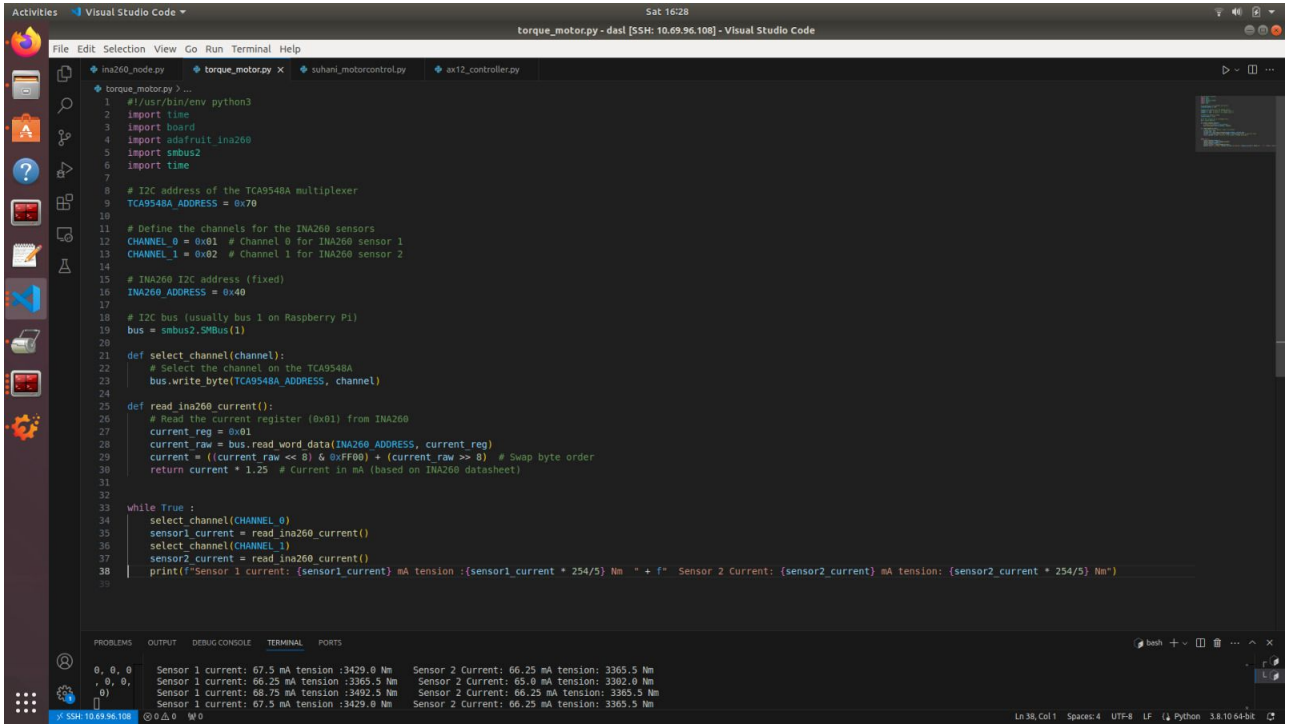
End Effector

Software : code used : *Current sensors*



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Theories

- Motor theory

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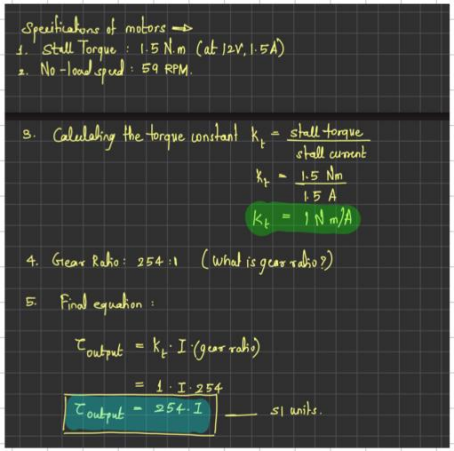
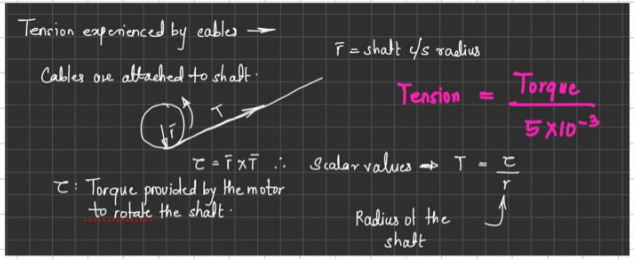
End Effector

Motor theory

Current → Torque → Tension





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Theories

- Motor theory

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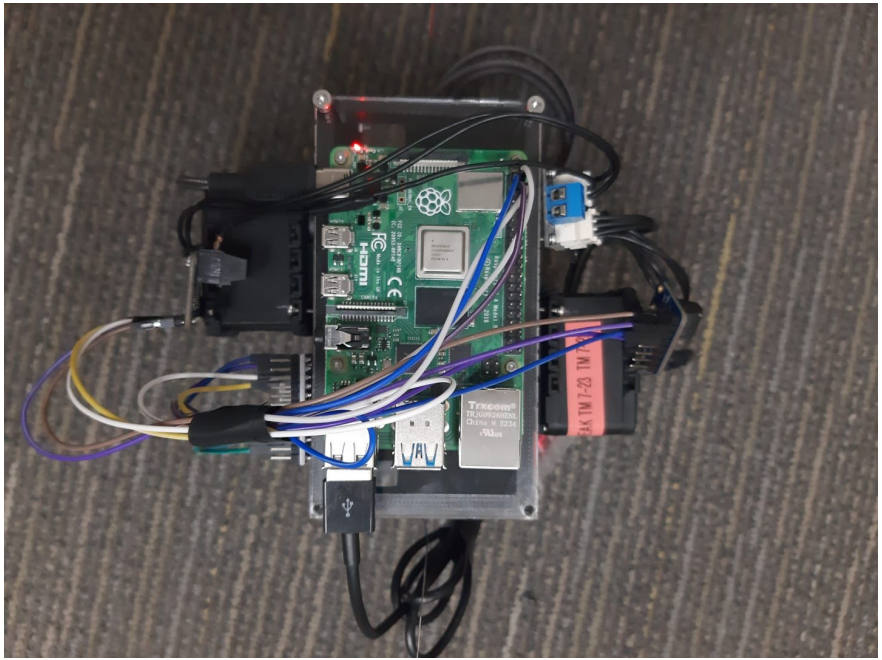
End Effector

Putting everything together



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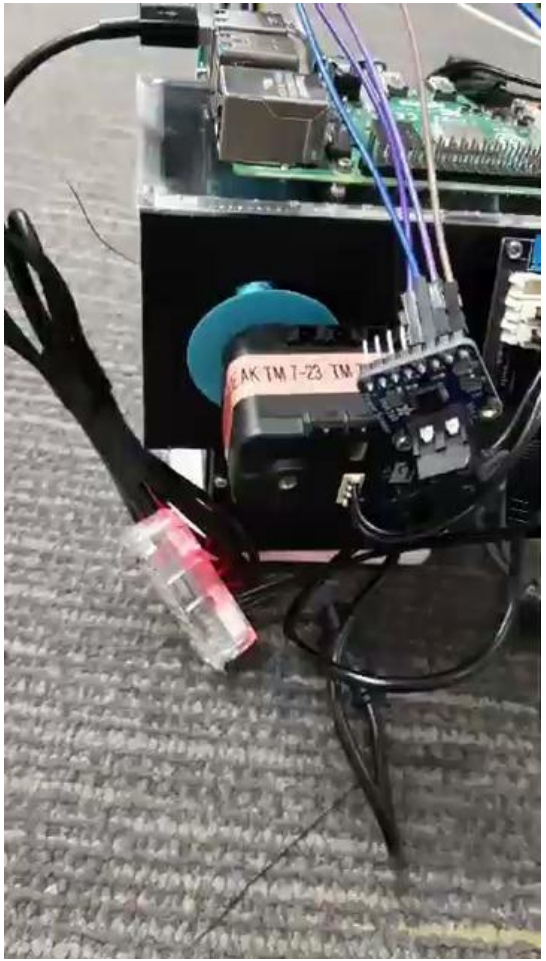
Putting everything together



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End Effector

Putting everything together

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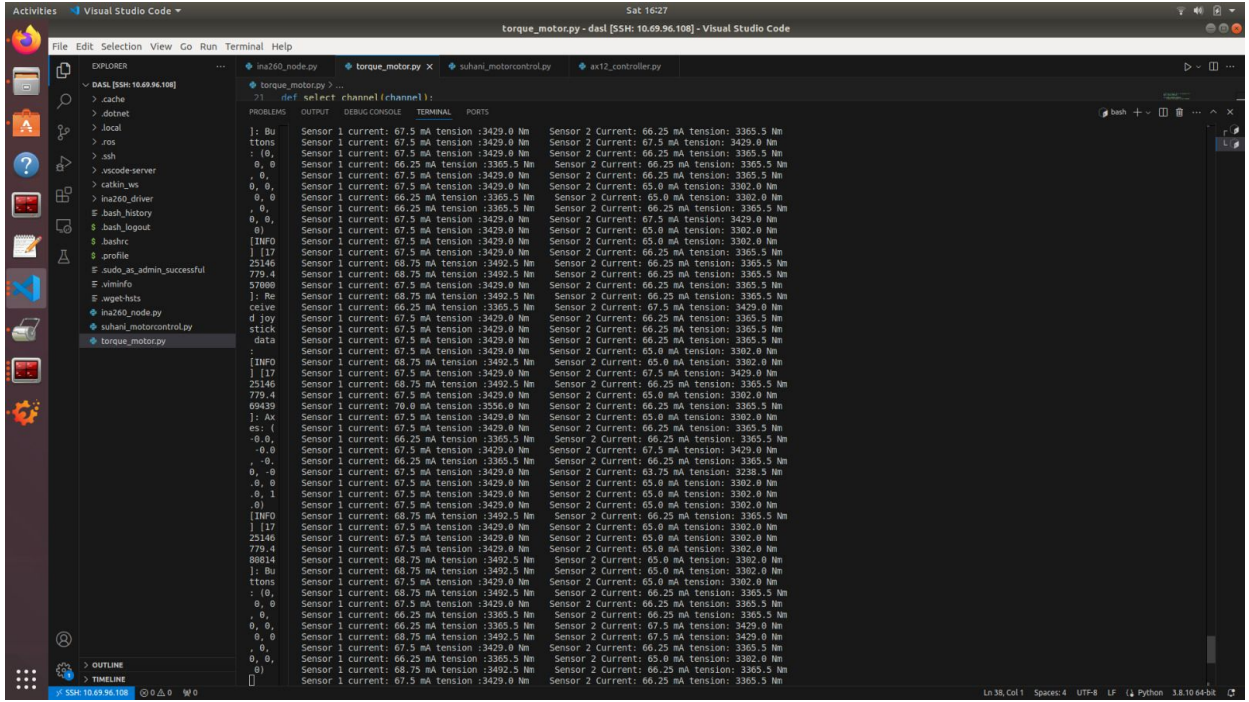

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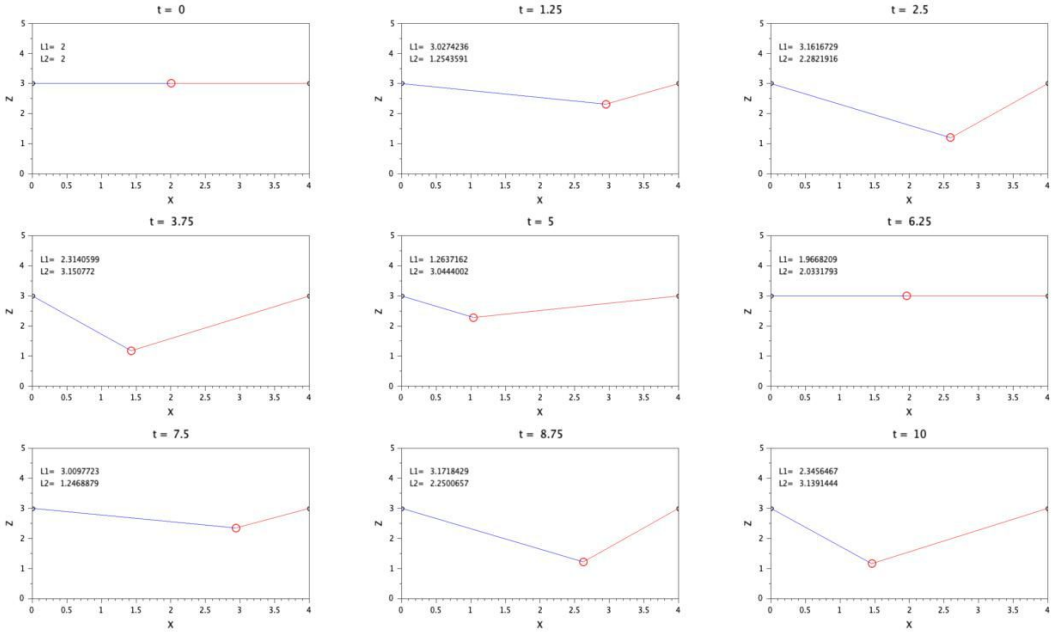
Putting everything together



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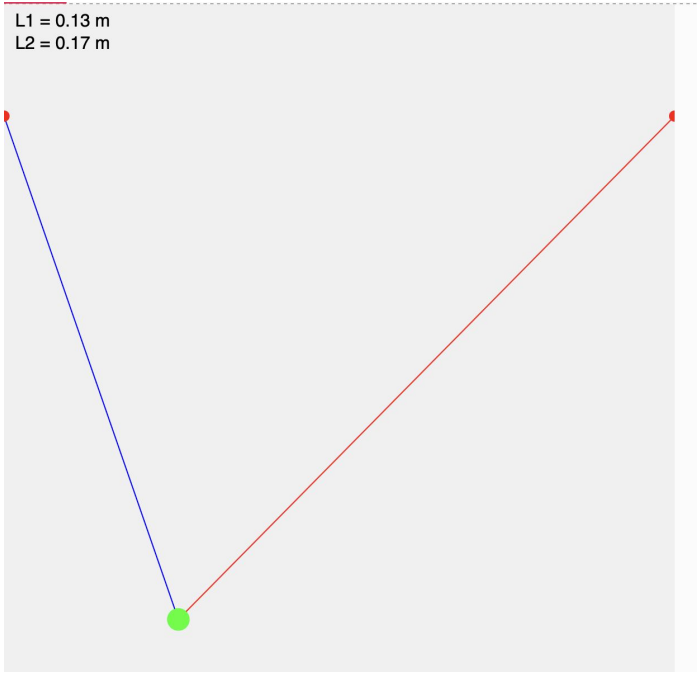
Putting everything together



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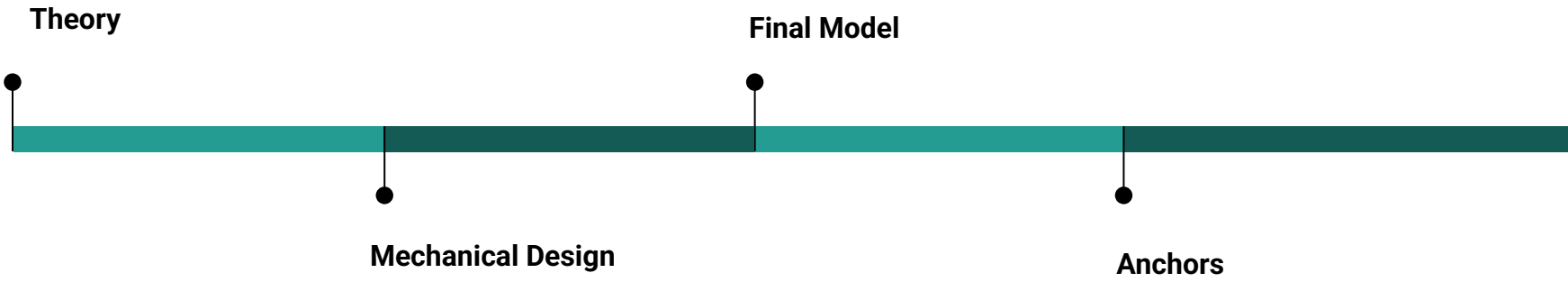
Projectile launcher

- Spring constant calculation



Projectile launcher

- **Spring constant calculation**

Theory

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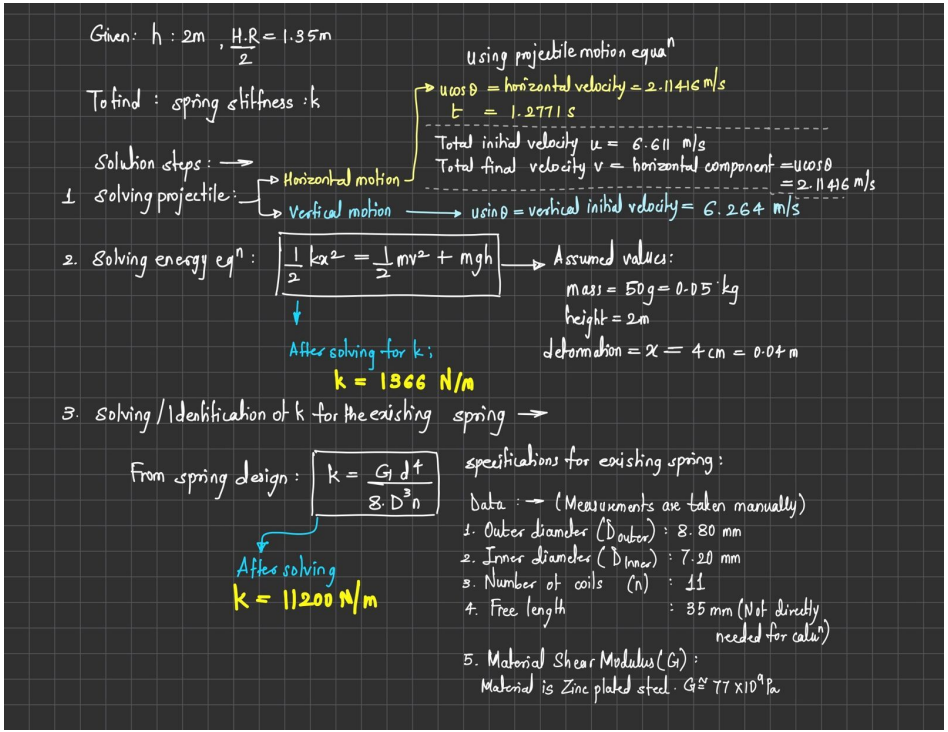
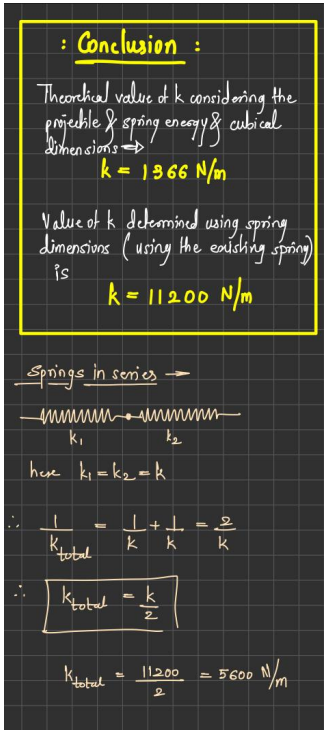
Projectile launcher

Working on spring constant





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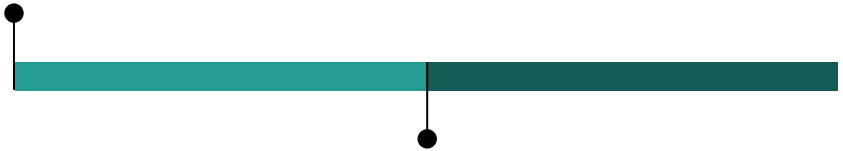
Projectile launcher

- Spring constant calculation

Theory



Mechanical Design

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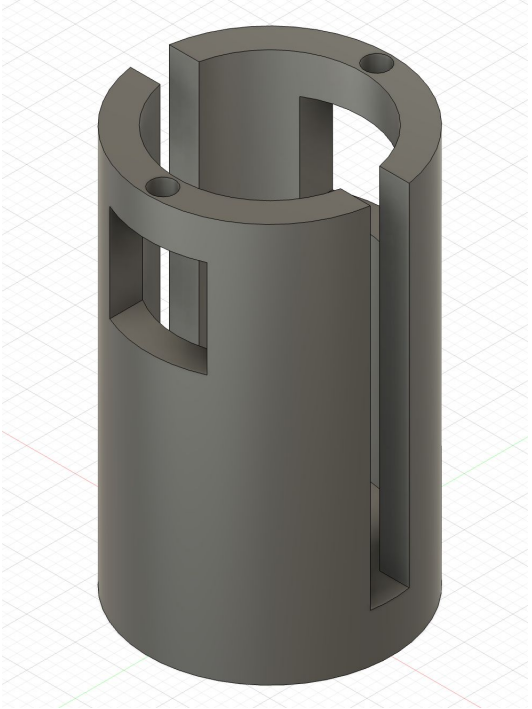
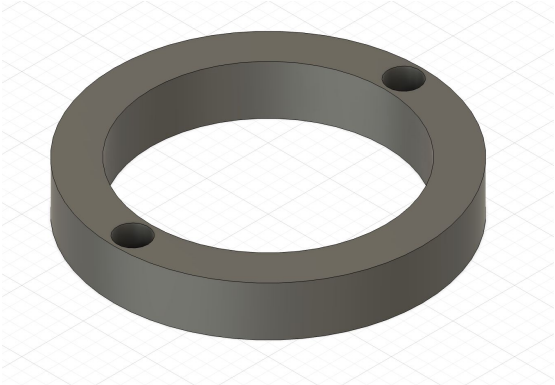
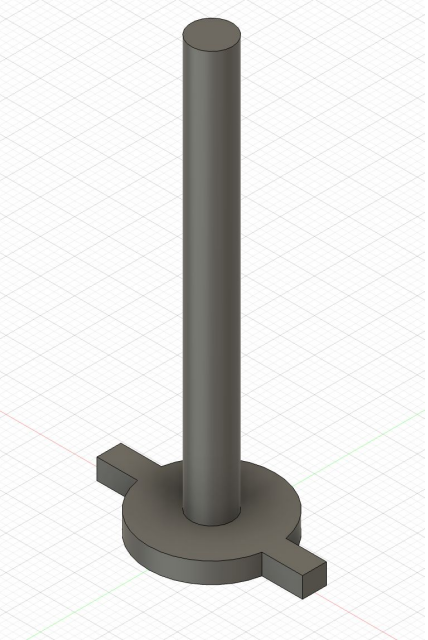
Projectile launcher

Design







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Projectile launcher

- Spring constant calculation

Projectile launcher

Final model

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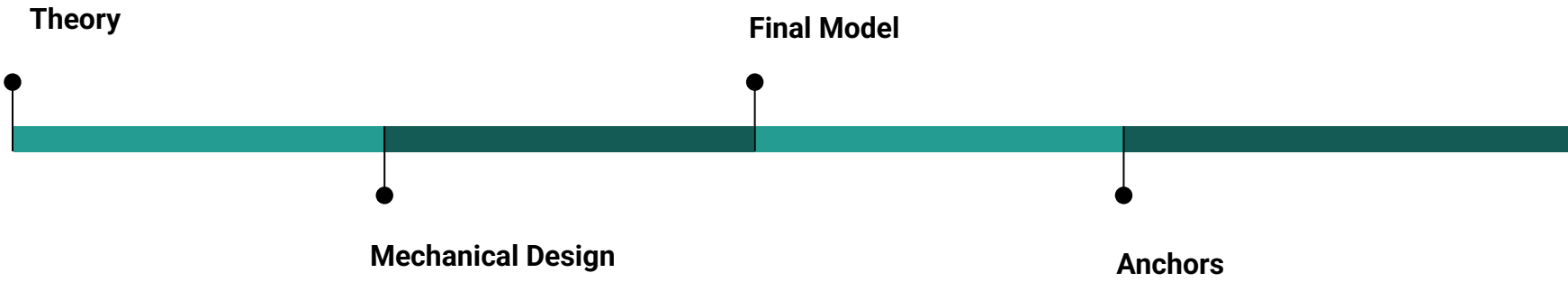
Projectile launcher

- Spring constant calculation



Projectile launcher

Anchors

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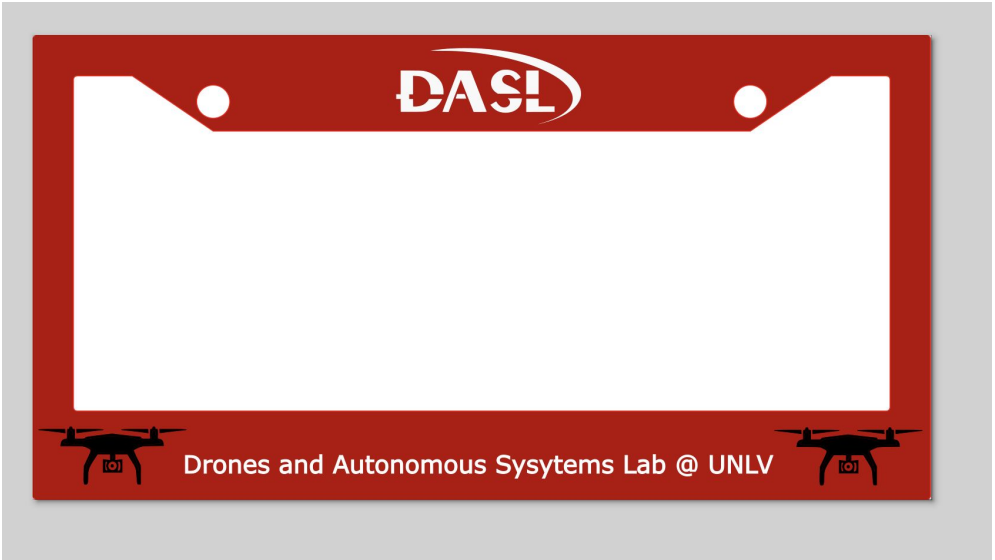
Unwinding


they're ready to
meet your parents.


DASL
Drones and Autonomous Sysytems Lab @ UNLV

Unwinding

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Thank You