

Neurological Recovery Device

AlonTree

Funding Provided by:



PROBLEM STATEMENT

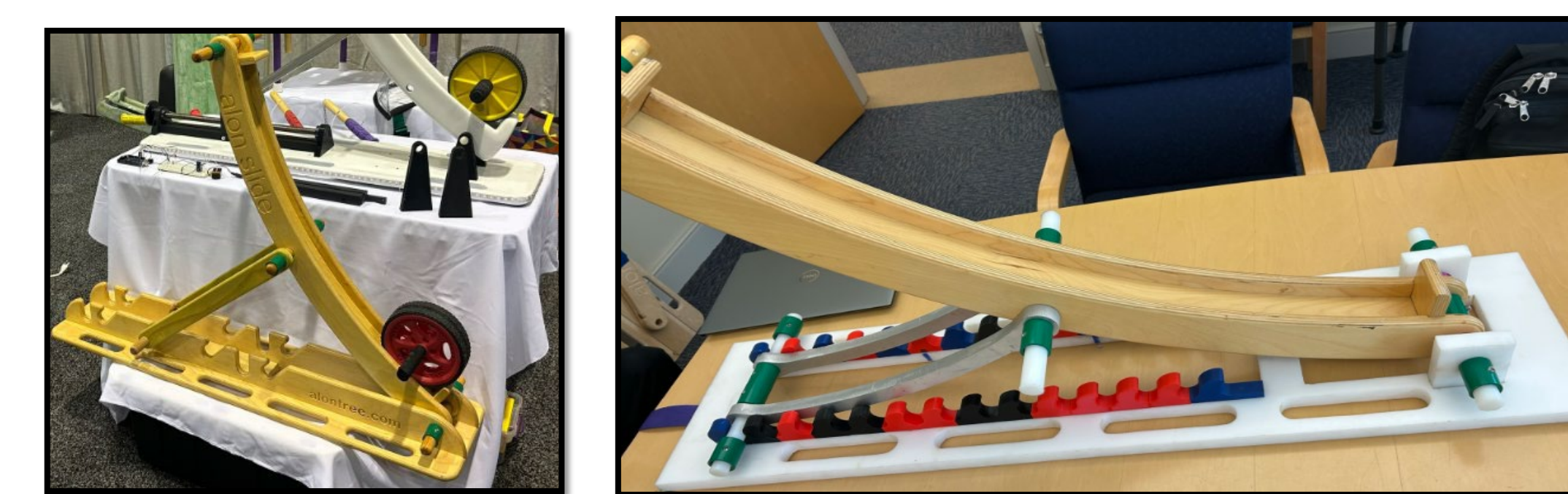
- Stroke survivors usually lose functions in their limbs which results in a need for physical therapy to regain mobility.
- AlonTree is striving to create an engaging physical therapy device to help stroke survivors regenerate strength and mobility.

REQUIREMENTS

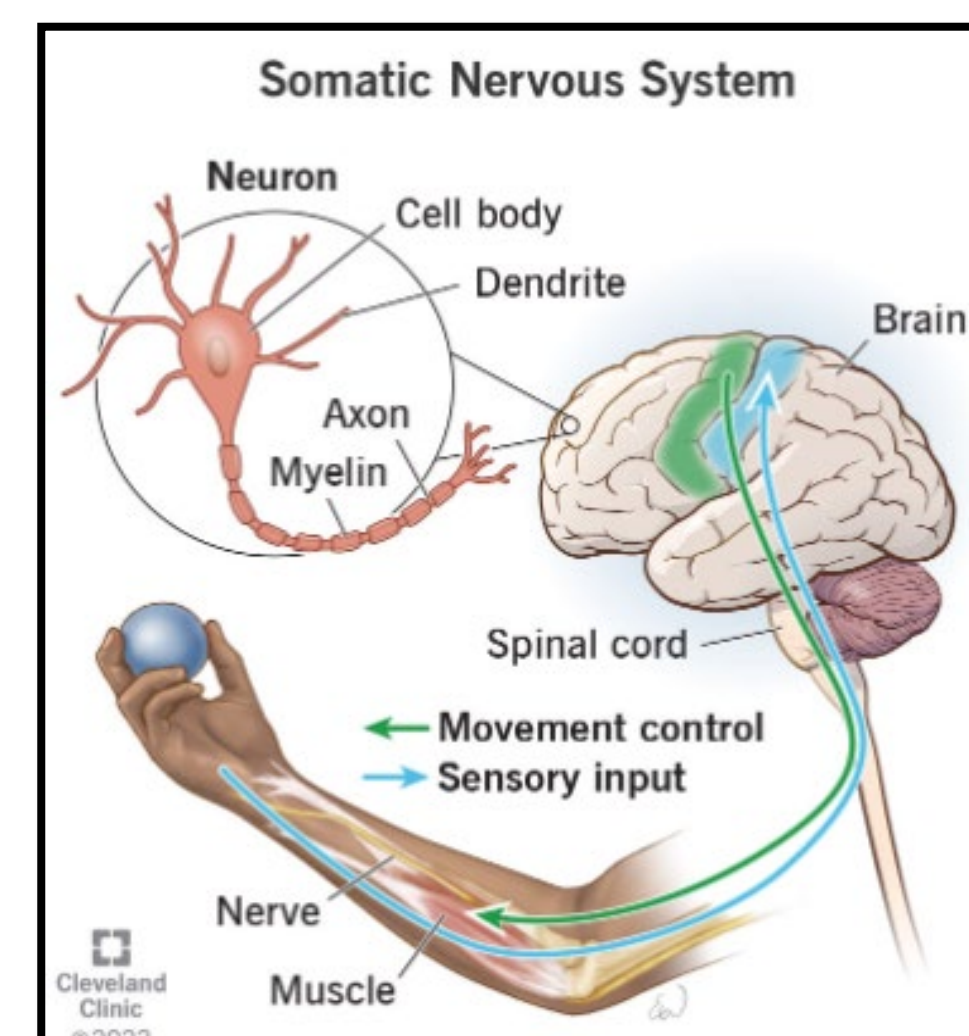
- **Lightweight** – AlonSlide device must be lightweight to carry with one hand and to reduce shipping costs. The goal is to reduce the weight by 20% of last year's prototype.
- **Ease of Use/Safety** – Easier adjustment mechanism that allows for multiple angle changes. Add an enclosure around the adjustment mechanism to provide safety for the user.
- **Gamification** – The device will provide electronic feedback, keeping score like a game, to allow the user to be incentivized in their therapy routines.

CONCEPTS

- The team was provided CAD models of the arm and base from last year's capstone project.
- The current design for the AlonSlide includes the wooden slide with two aluminum support braces, and PLA 3D printed teeth on an acetal base.

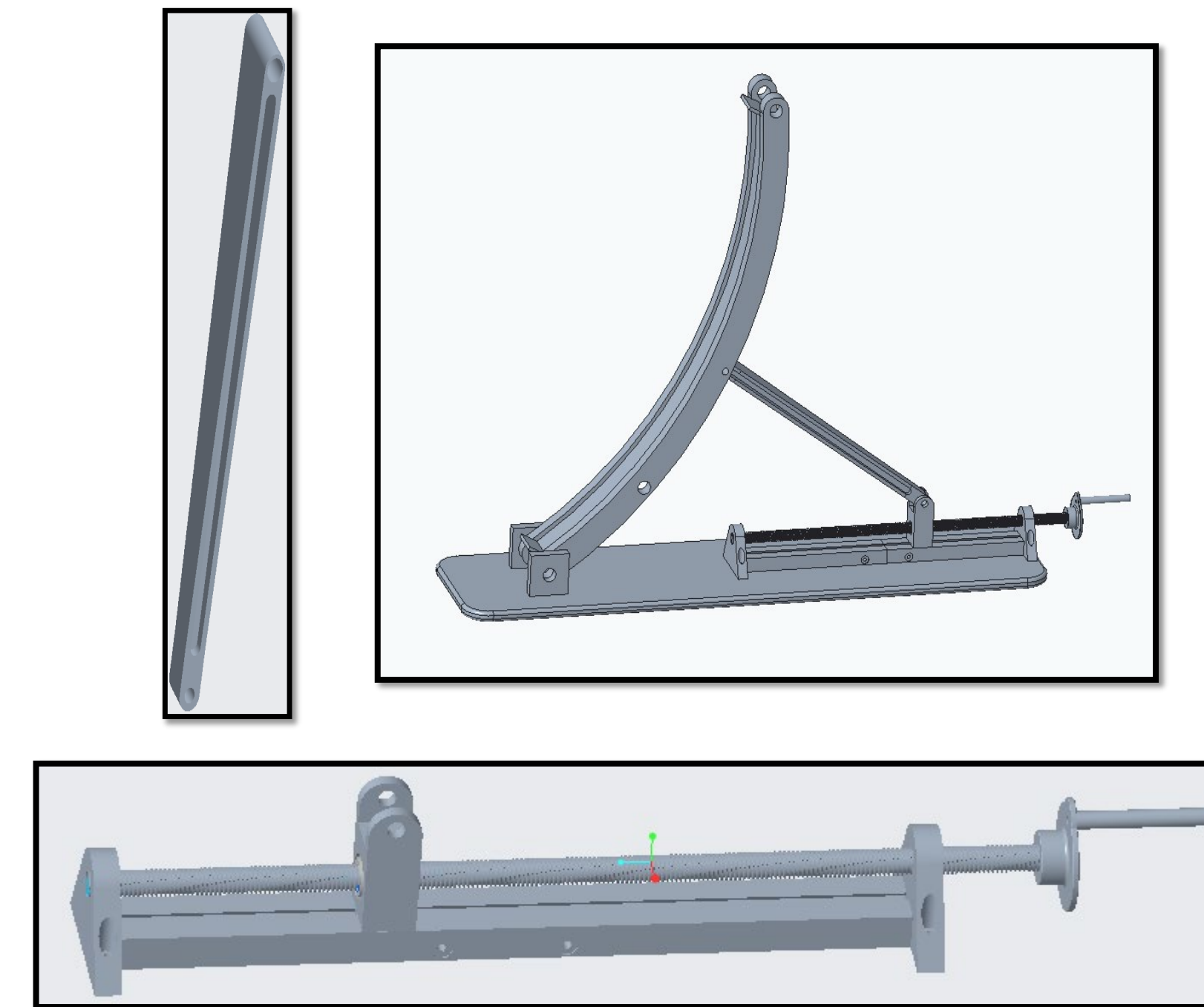


- The ab roller is used by the patient to roll up and down the slide to rebuild and strengthen mobility and coordination.



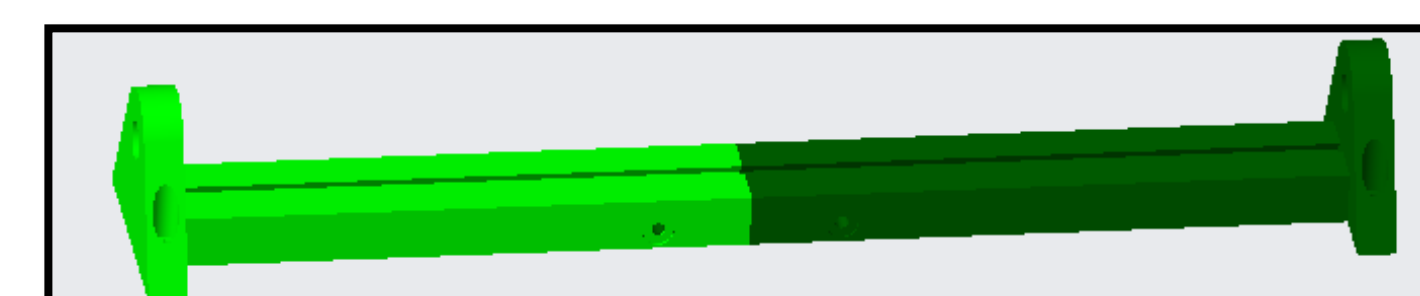
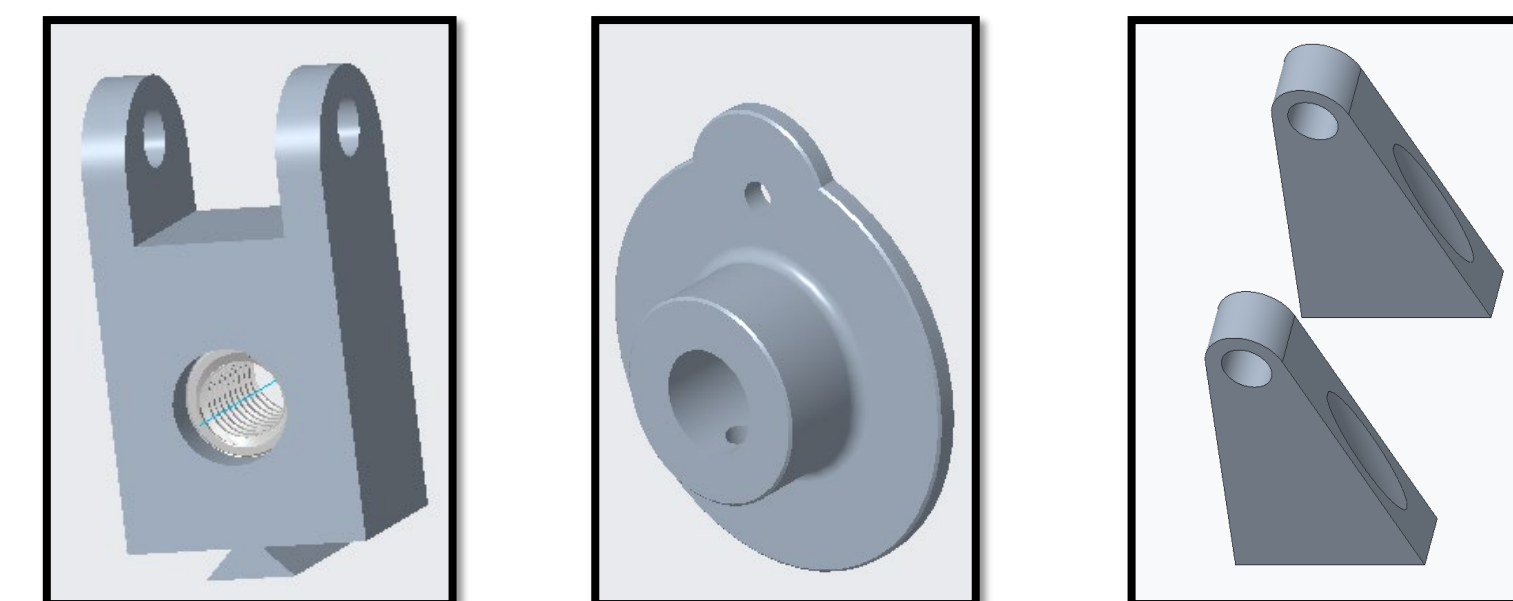
FINAL DESIGN

- **AlonSlide** – The final design for the slide includes a re-modelled aluminum brace and an adjustment mechanism that allows for infinite angle changes.



• 3D Printed Components

- Translating Pin, Knob Attachment, Dovetail Slot Assembly, Base Connecting Pieces

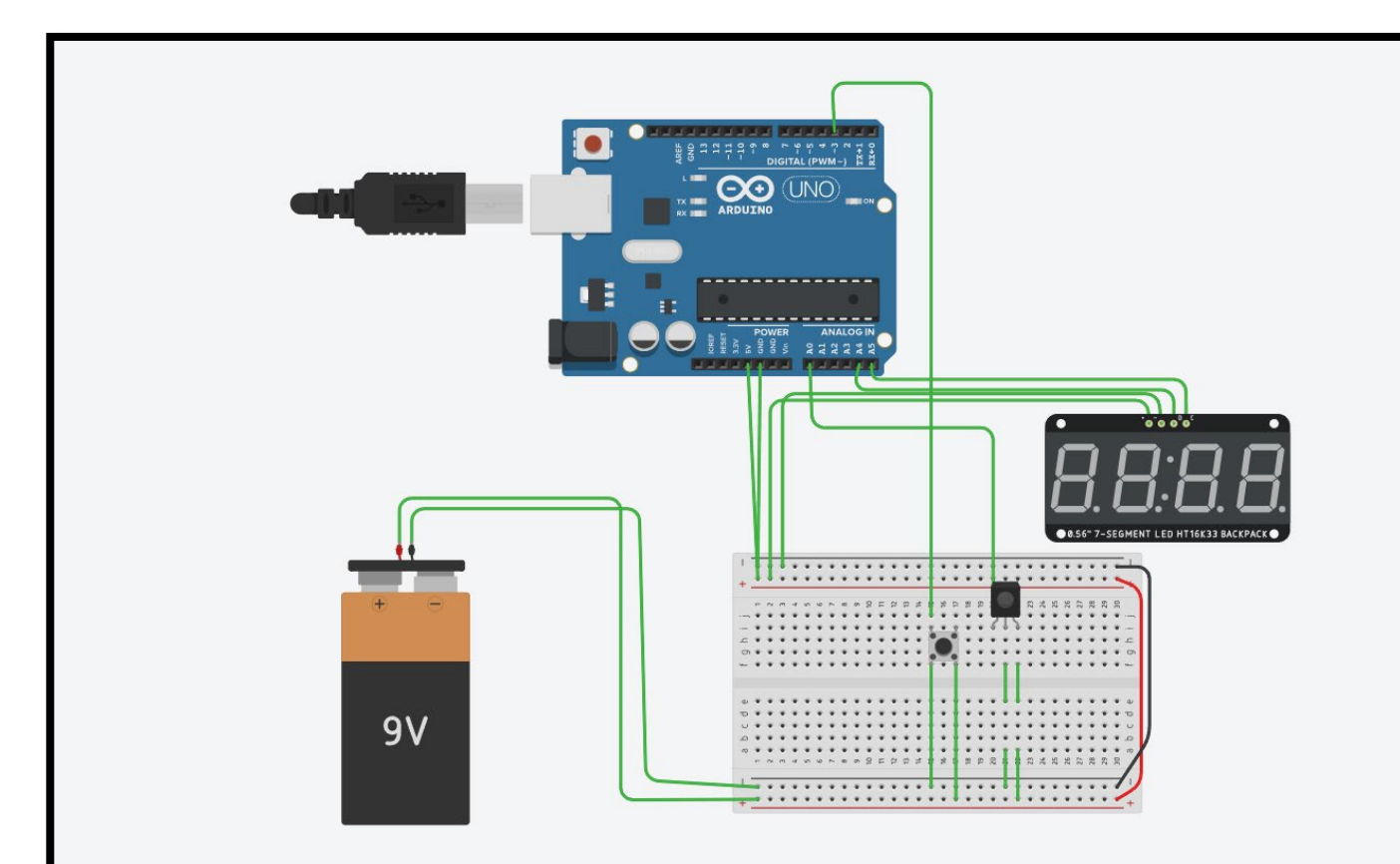


• Slide and Base Components:

- Fiberglass molds were made from the original wooden prototype.
- The slide and base components were fabricated out of carbon fiber and fiberglass



• Gamification Schematics:

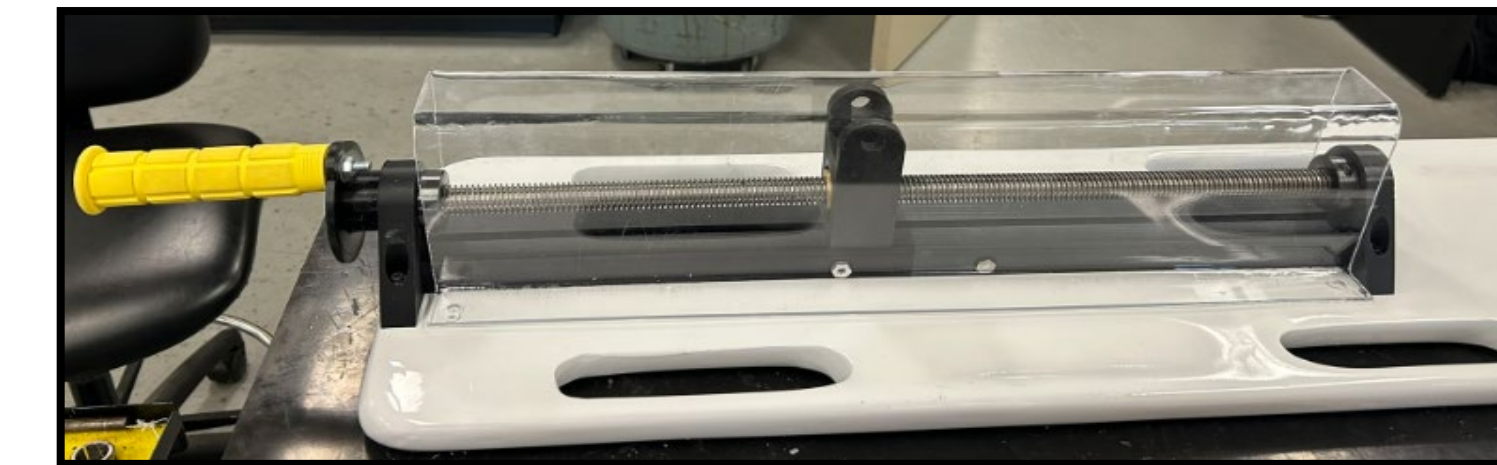


RESULTS

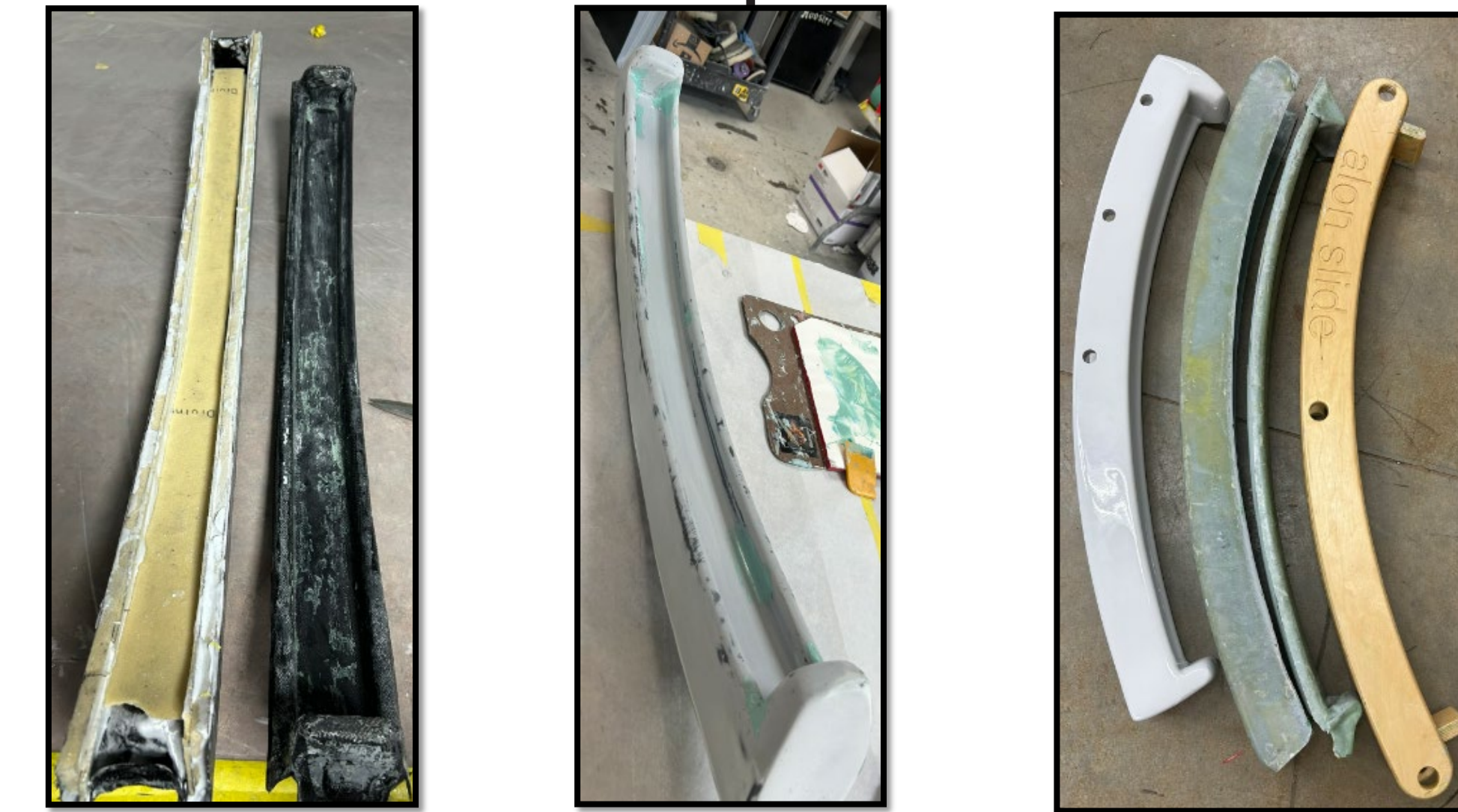
• Aluminum Brace:



• Adjustment Mechanism:



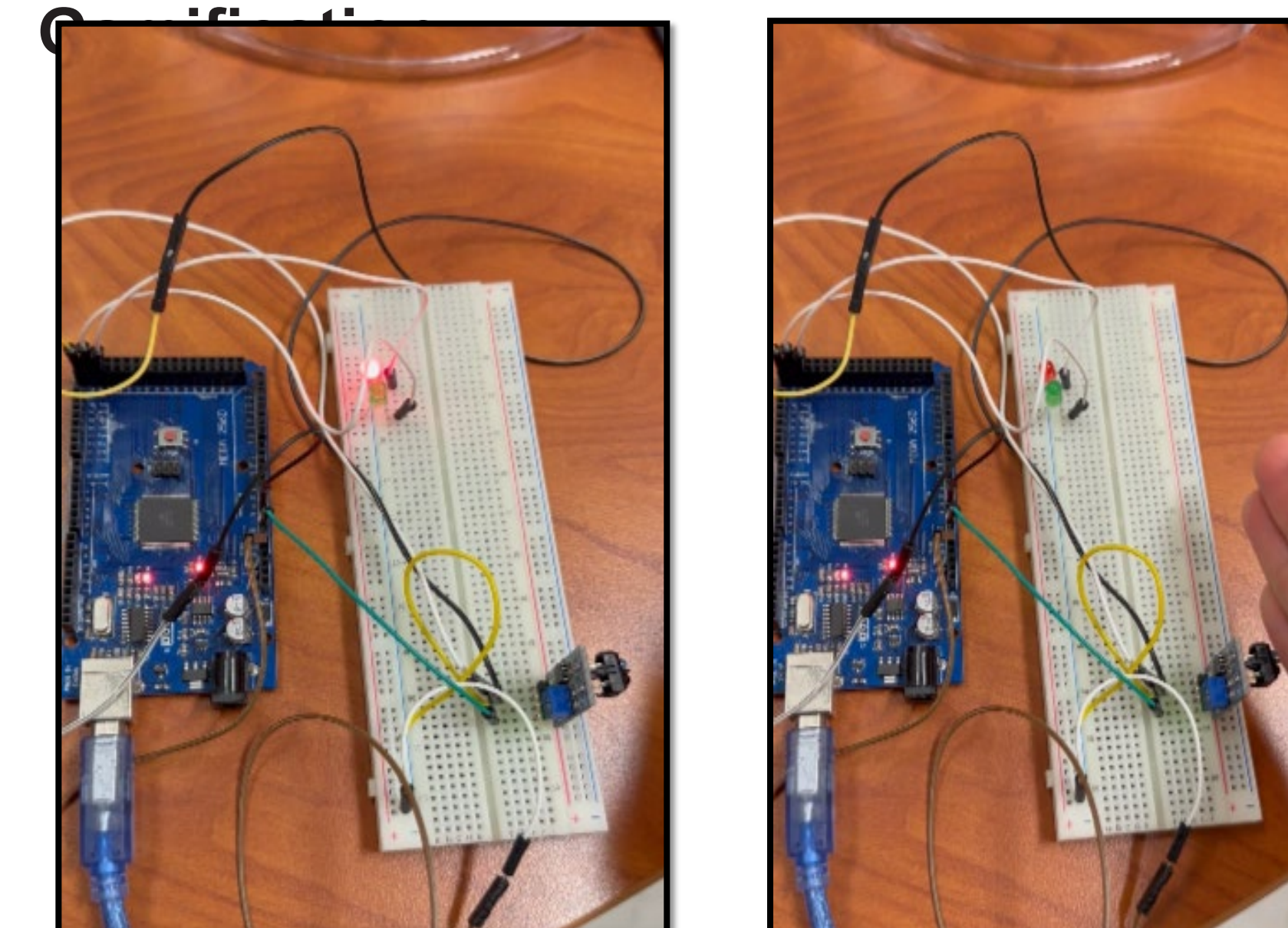
• Slide and Base Component:



• DC Motor Attachment:



• Gamification:



SUMMARY AND CONCLUSIONS

• AlonSlide

- Offers more angles of adjustment and an easier adjustment mechanism for patients.
- Features are efficient and sleek.
- Two main components decreased in weight. (lighter weight for shipping costs + easy to carry)
- Gamification allows users to be more engaged in their journey of physical therapy to gain back mobility.

FUTURE WORK

- In the future AlonTree would like to expand the AlonSlide:
 - Bluetooth connection to provide the patients progress to their therapists via technology.
 - Different slide attachments to allow for versatile therapy routines.

TEAM & ACKNOWLEDGEMENTS

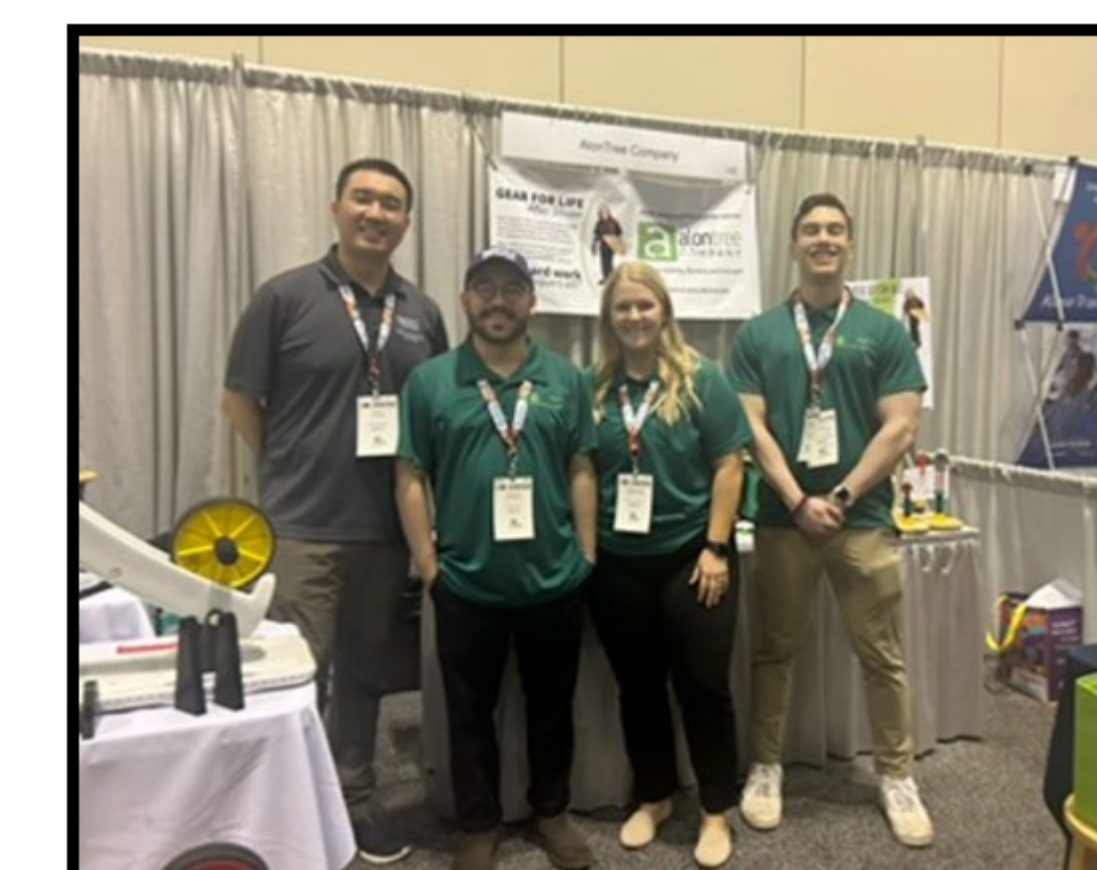
• Team:

- Joaquin Rodriguez (Engineering Technology)
- Catherine Johnson (Mechanical Engineering)
- Josh Khamphengphet (Electrical and Computer Engineering Technology)

• Fabrication Mentor: SouthTec Aviation

• Mentor: Yang Zhang

• Sponsor: AlonTree



REFERENCES

- Professional, C. C. medical. (n.d.). *Somatic nervous system: What it is & function*. Cleveland Clinic <https://my.clevelandclinic.org/health/body/23291-somatic-nervous-system>