



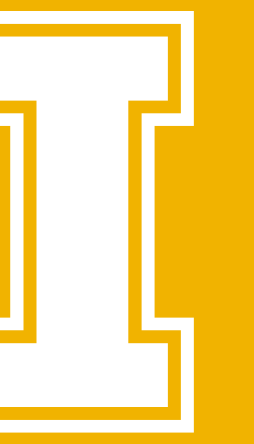
OPTICAL DEVICE ARM ALIGNMENT

Developed By Team FibAir

Ethan Corgatelli, Donald Hammer, Hunter Leppek, and Joseph Miller

Lead Instructor: Bruce Bolden

Client: JP Hansen - Hansen Photonics



GOAL

Our goal is to create software that enables automated laser calibration for Hansen Photonics' fiber optic launching system, which allows greater access at a better price to underserved areas.

BACKGROUND

Large internet service providers have exclusive rights to lay fiber optic cable in many areas. Because the launching system works completely over-the-air and by line-of-sight, it avoids the expensive and destructive process of laying fiber optic cables. The existing method of calibration must be done manually and is an involved process. We have provided a system that does not require constant human attention and achieves calibration more quickly.

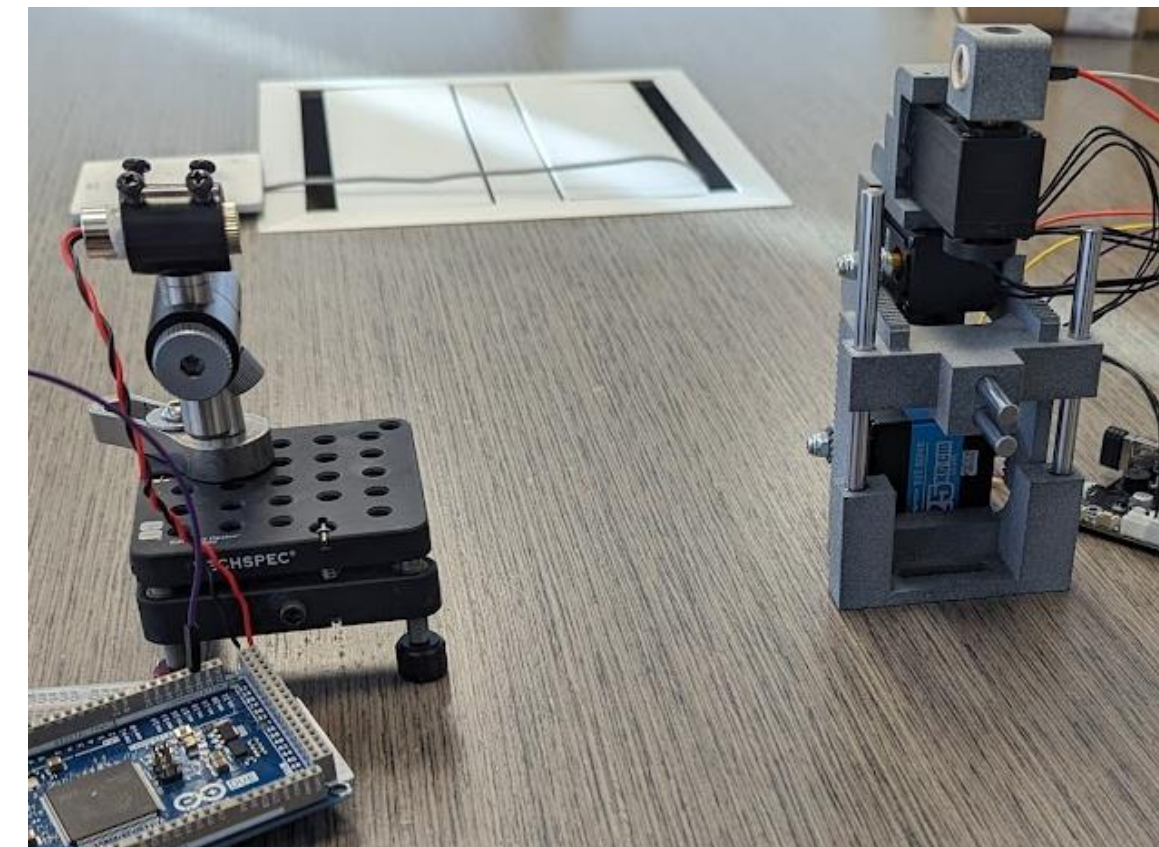
KEY REQUIREMENTS



Minimum Voltage for Signal Detection	Minimum Calibration Distance	Maximum Calibration Time
0.2 Volts	3 feet	60 minutes

CONCEPT DEVELOPMENT

- I Design calibration software for laser receiver
- I Language: Arduino C
- I Environments: Arduino IDE VS Code Platform IO



VALIDATION RESULTS



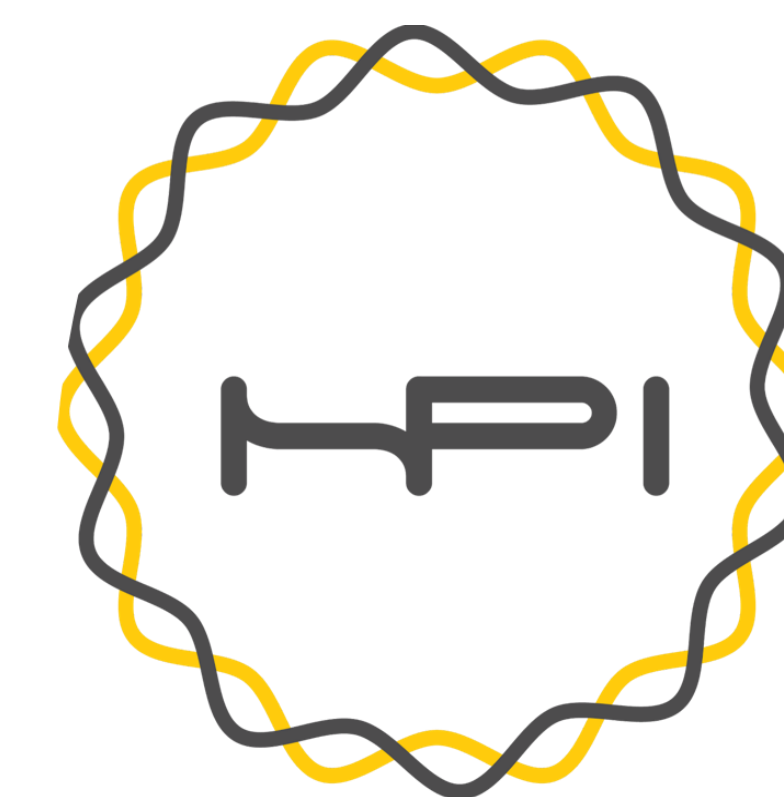
Voltage	Distance	Time
Minimum voltage threshold: 0.7 volts	Was able to calibrate at 3 feet	Average time to calibrate: about 30 seconds

CONCLUSION

Our calibration program was able to exceed minimum requirements. Future refinements of the program could explore variant scanning patterns that may reduce the calibration time under certain conditions.

ACKNOWLEDGEMENTS

Dr. Conte de Leon
JP Hansen and Hansen Photonics



THE FINAL DESIGN

- I Scan for a signal using a spiral pattern
- I When a valid signal is found, find bounds of signal area in X, Y, and R.
- I Set final position to location with highest input voltage

