Homefront Intelligent Target System

Project Description

PROTECT THE HOMEFRONT
• TRAINING • STARTS • HERE •

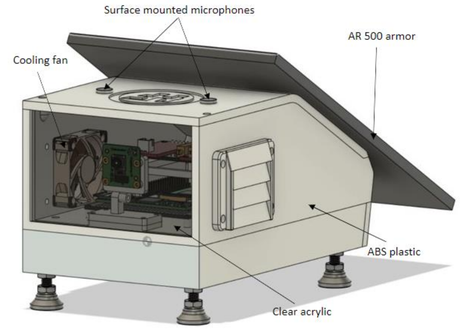
Manually checking and taping targets while you're shooting sucks. Our sponsor is keenly aware of this as he is a firearms instructor. We want to make a computer do the work for you.

Our goal for this project was to create a system that would automatically detect where on a target you hit, eliminating the need to manually check or tape the target. The system must be highly portable, durable, and accurate.

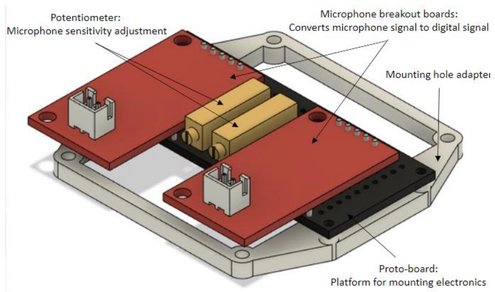
Design Description

- 1). Main device body is 3D printed - feet and armor custom ordered. Contains 2). And 3).
- 2). RaspPi camera photographing target while Raspberry Pi runs machine vision model and relays location to app on user's phone.
- 3). Teensy running microphones to detect shot and give rough estimate of bullet location.

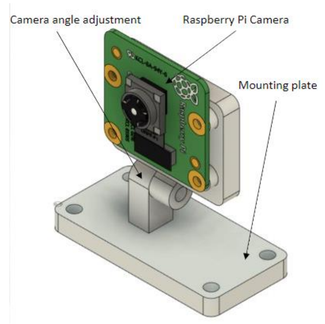
1).



2).

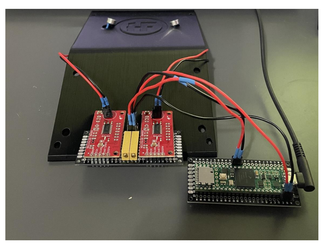


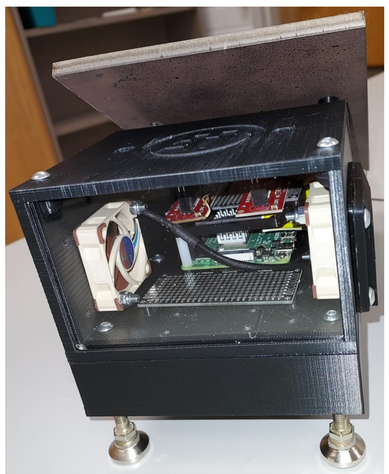
3).



Performance Review

- Analysis
  - Position Accuracy
  - Total System Weight
  - System Dimensions
  - Survivable Impact
  - Setup Steps and Time
  - Time exposed to inclement weather
- Testing
  - Operating Distance
  - Time Accuracy
  - Refresh Rate
  - Survivable Impact Caliber





Conclusion

- The casing does a great job of protecting the electronics, and the sensors are functioning properly, but the software needs work.
- Lessons Learned: Projects always take twice as long and cost twice as much as you think.
- Recommended Future Work: Get Computer and Electrical engineers to work on the software and app development. Upgrade to an Nvidia Jetson for faster image processing.

Nvidia Jetson

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