

Machine Powered,
Player Proven



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Background

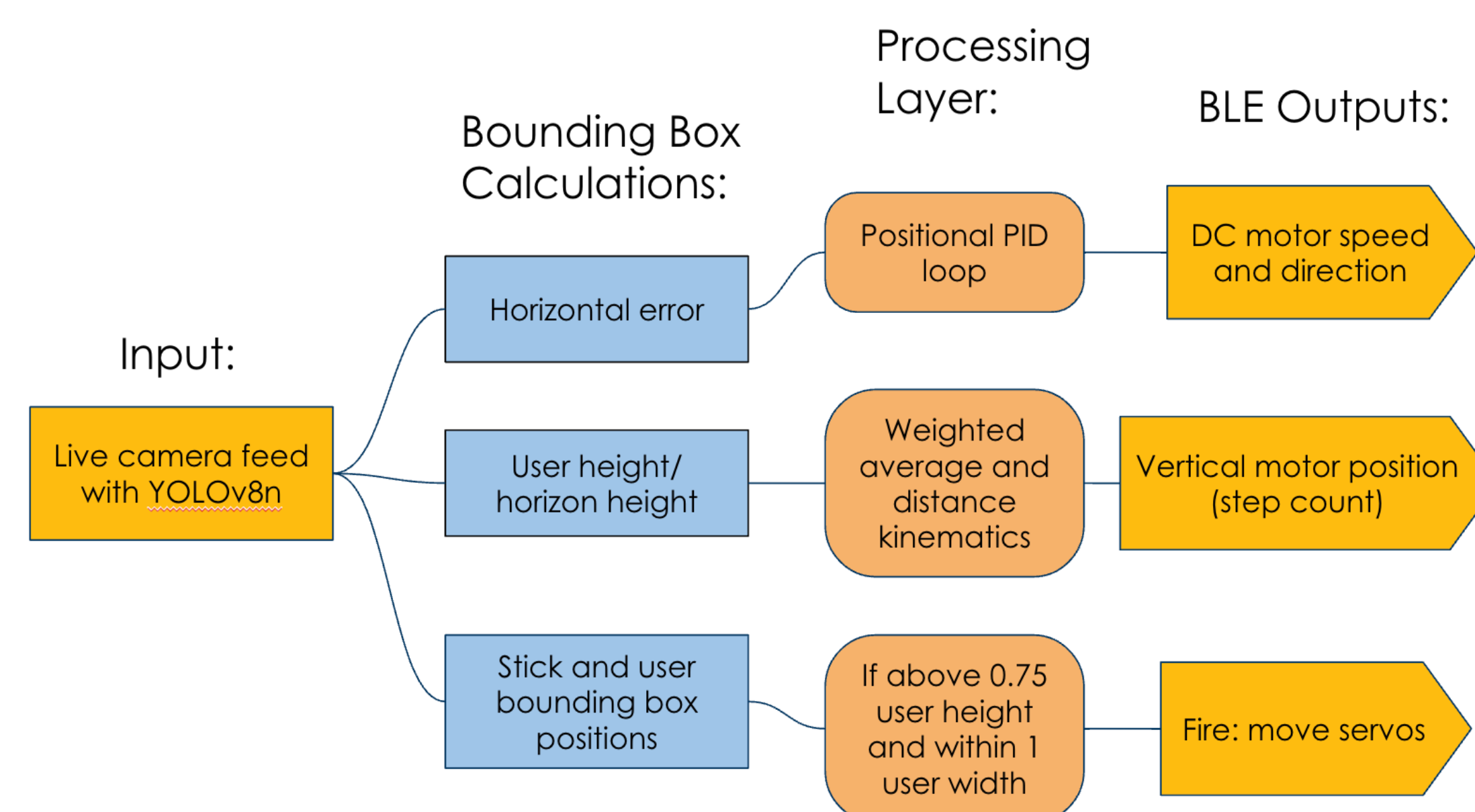
Throwbotics is pioneering the next generation of sports training technology. Our flagship product, LaxBot, is the world's first lacrosse robot powered by computer vision—designed to elevate independent practice through intelligent, adaptive performance.

	LaxBot	Private Coaching	Rebounders	Pitching/Tennis Machines
Independent	✎		✎	✎
Realistic Training	✎	✎		
Feedback	✎	✎		
Multi-sport	✎		✎	
Cost	\$999	\$5,000/yr	\$200-\$500	\$1,000+

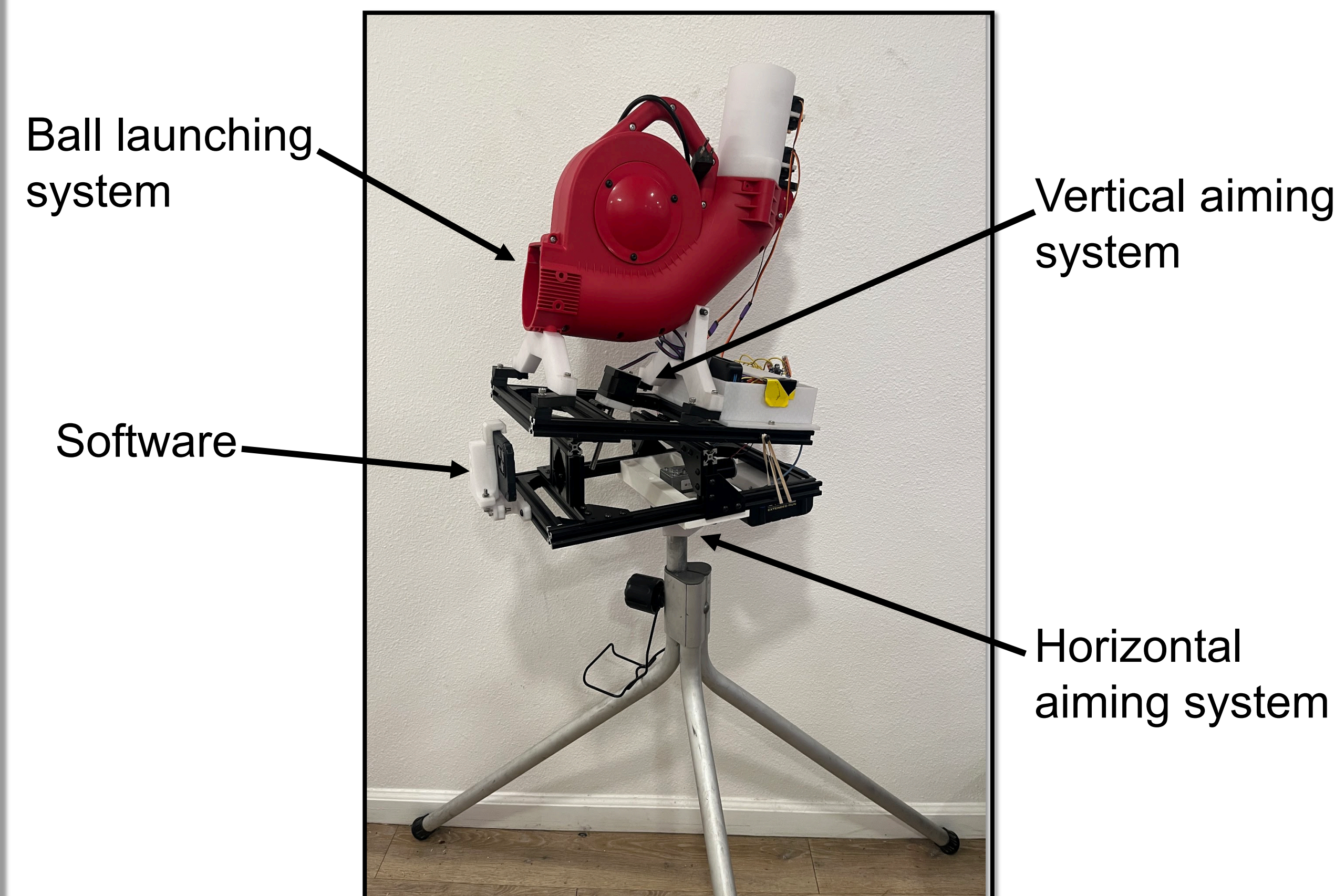
Overview

LaxBot leverages a custom native iOS app with advanced computer vision algorithms to track player movement in real time. When a player signals for a pass, LaxBot precisely targets and delivers the ball, enabling dynamic training sessions without the need for a partner.

Functional Flow Diagram



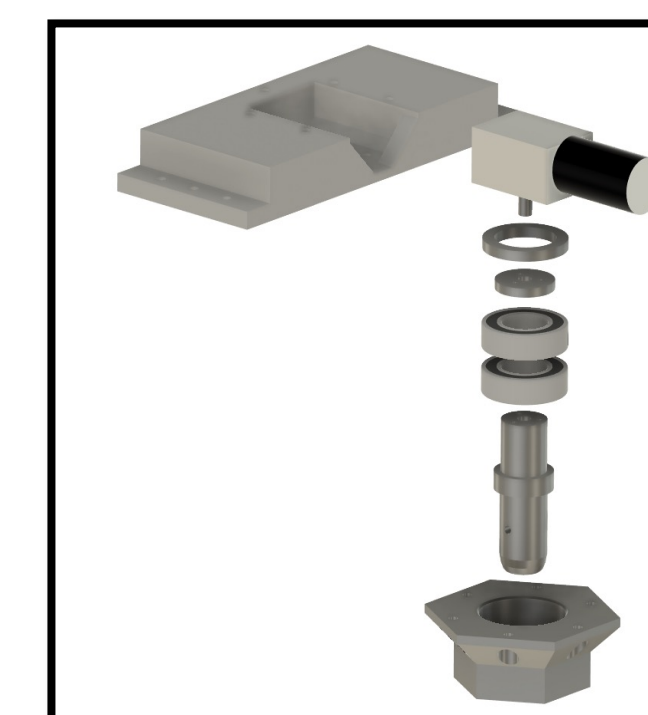
LaxBot Final Prototype



Key Components

Horizontal Aiming System

- Metal worm drive (2.2 Nm and 27 rpm) driven with a DC motor
- 2 tapered roller bearings
- Machined Metal Adapter between tripod and motor.



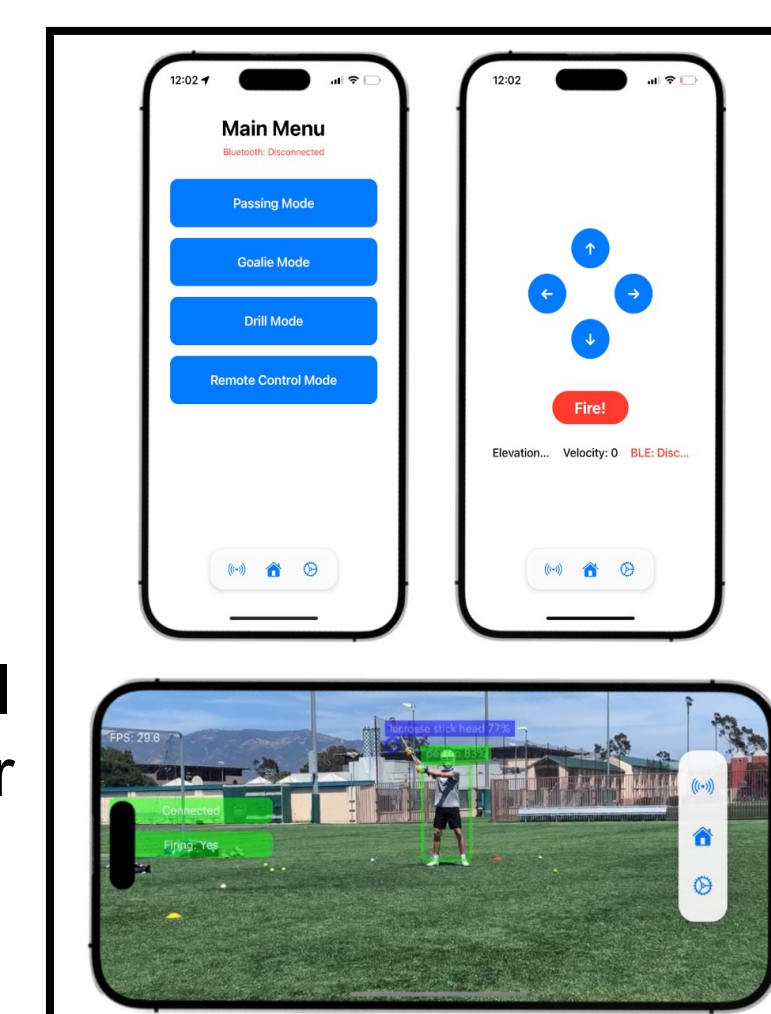
Vertical Aiming System

- Single lead screw shaft attached to motor
 - NEMA 17 stepper
- Dual hinge design
- Allows for 0° to 45° range



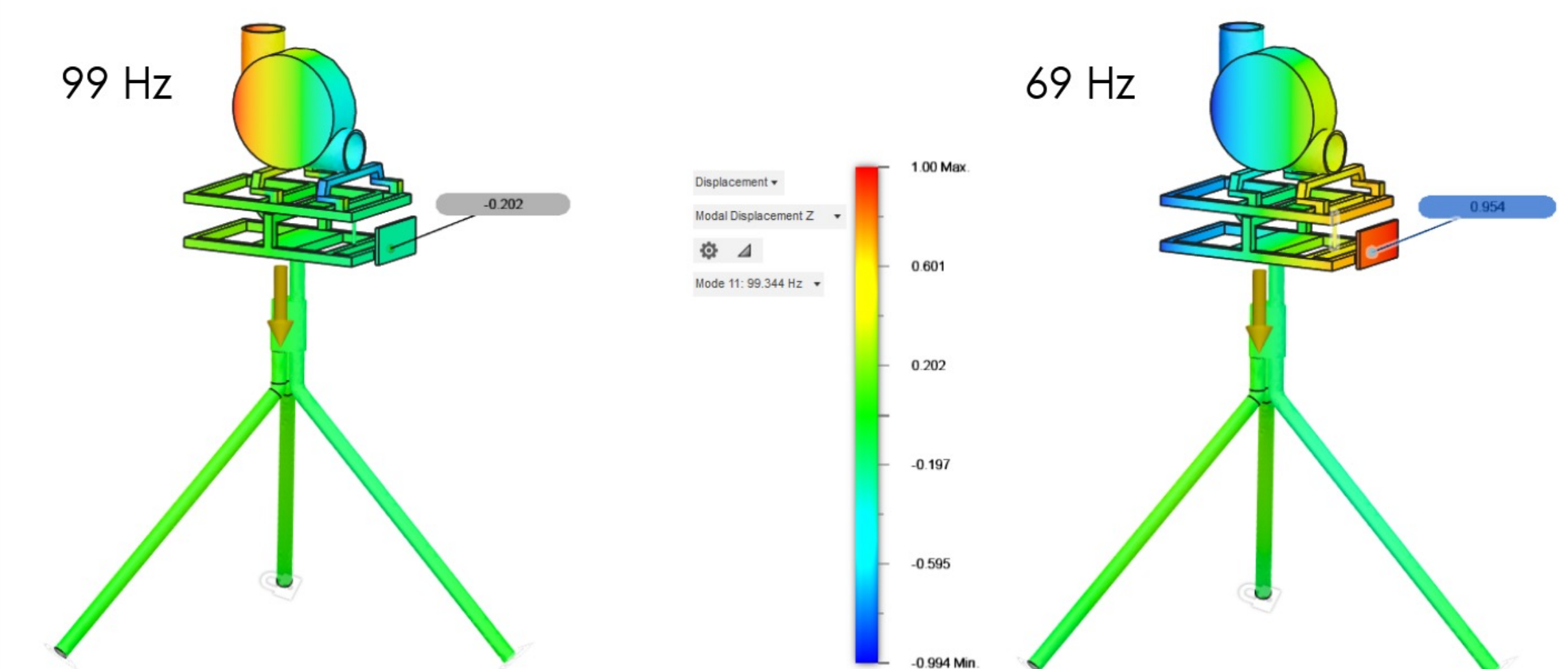
Software

- App is used for:
 - User Interface, object and gesture detection, all calculations, sending motor control signals over BLE
- Native iOS app (Swift)



Vibrations at Different Frequencies Simulation Results

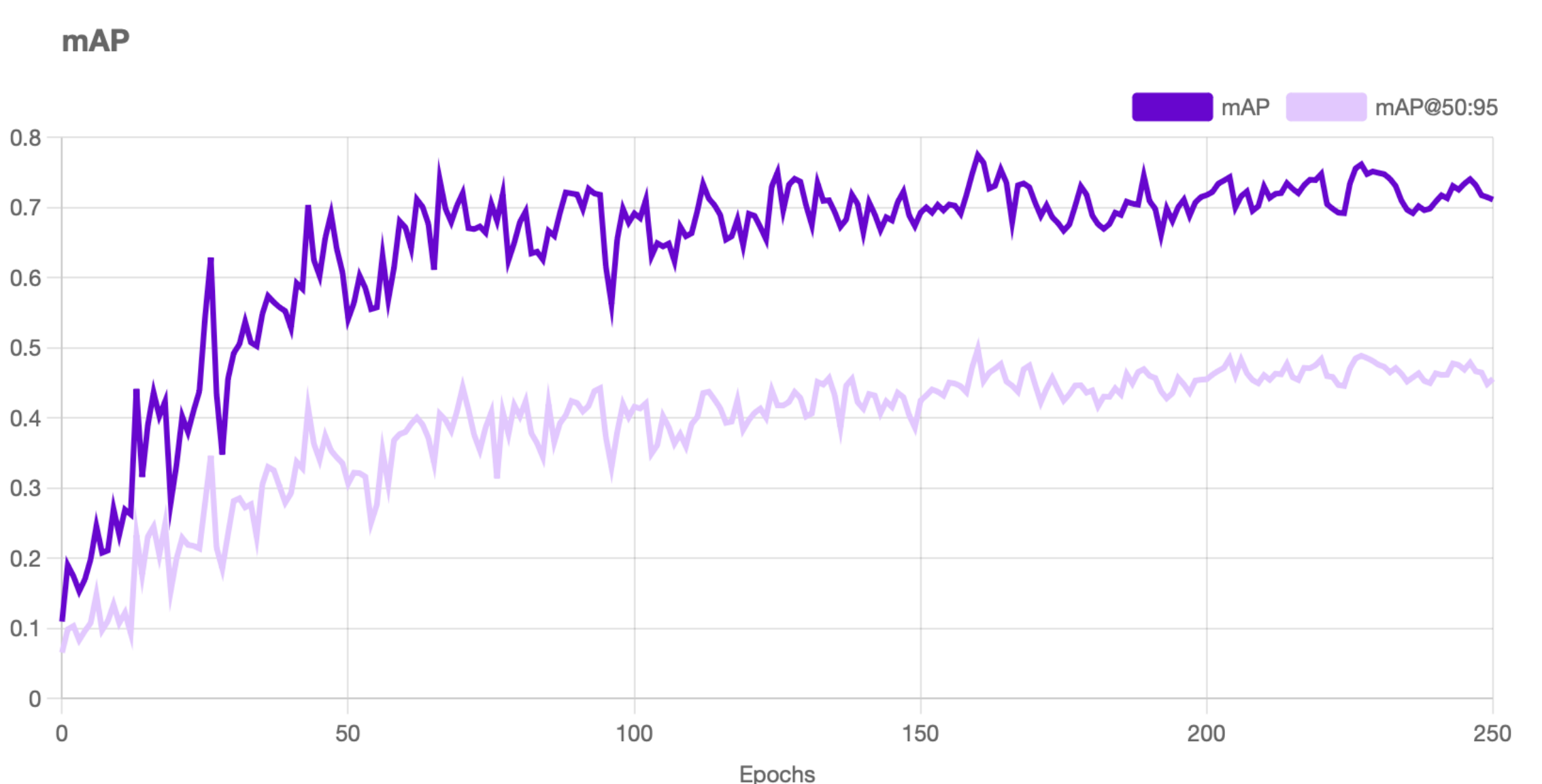
- Modeled at the different modes, 69Hz and 99Hz



- Phone mount will only shake at one mode in the frequencies ranging from a full stop to the maximum rotation rate
- Flywheel spins at 8000rpm, or 133Hz
 - No camera shake as mode causing shake is a much different frequency

Computer Vision Model Results

- YoloV8n trained with 400 images
- Identifies people, lacrosse sticks, helmets, and goggles.



- Achieved 70-80% mean average precision (mAP)
- mAP is a combination of the model's ability to both identify an object, and correctly judge what the object is
- Clear trend that as the model is trained, mAP increases.
- With more images and model training it is safe to assume that greater than 90% mAP can be achieved.