



AUTOMATIC DOG BALL THROWER

TEAM 138

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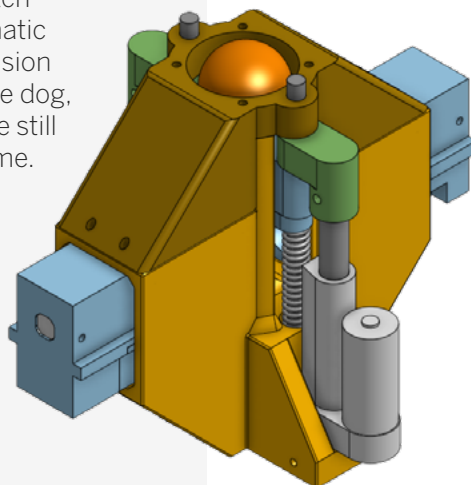
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OVERVIEW

Our project is an Automatic Dog Ball Thrower that uses a vision system and launching mechanism to launch a ball, helping owners prolong their playtime with their dogs!

THE PROBLEM

Our customer's dog, Aka, is incredibly energetic and loves to play fetch. However, at times, his owner is unable to match his energy level. An Automatic Dog Ball Thrower uses a vision system to visually track the dog, ensuring Aka's safety while still allowing even more playtime.



THE REQUIREMENTS

The Automatic Dog Ball Thrower must not hurt Aka, must use machine learning to detect the dog's relative position, and must not use flywheels, which produce a noise that Aka dislikes.

THE SOLUTION

The launching system uses a spring-loaded platform compressed by high-force linear actuators. Two other linear actuators extend to lock the platform in place and retract to release it. The launching mechanism is supported on a rotary turntable controlled by a stepper motor, allowing the mechanism to change its launch direction. A computer vision system visually tracks Aka's position to determine a launch direction that will not hit him.

THE RESULTS

The mechanism achieves accurate horizontal rotation in 1.8-degree increments across a 70-degree angular range. It consistently launches a ball an average horizontal distance of 16 feet. The computer vision model reliably detects the dog within the live camera frame with more than 95% precision, allowing for precise real-time adjustments.

