FetchFinder: Fetch Beyond Sight

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Abstract
FetchFinder is dedicated to enhancing playtime for all dogs, especially those who are visually impaired or easily distracted. Our flagship products are balls enabled by radio frequency or Bluetooth connections for users to play sounds when the balls are motionless, ensuring continuous engagement and inclusivity in fetch games. By addressing a significant gap in the pet toy market, FetchFinder's technology makes every game of fetch enjoyable and accessible. Our mission is to improve the quality of life for pets and their owners, fostering stronger bonds through innovative play solutions.

Motivation
Fetch was Dexter and Brittany’s favorite game to play together… Until he went blind. Heartbroken by the realization that sight was vital to fetch, the idea of FetchFinder was born.

Current dog toys don’t make noise when they are still, reducing the fun and accessibility for distractible or visually impaired dogs.

Methods and Materials

Mechanical Components
- Outer Layer: Food/Dog safe TPU
- Inner Layer: Nylon
- Electrical Housing: PLA
- Method: 3D printing

Electrical Components
- 900mAh Lithium-Ion battery
- USB-C charger
- epoxy resin filling around components for durability

RF Module
- RF module (~30m range)
- ESP 32 Bluetooth module (~20m range)
- I2S Amplifier

Software Development
- Wireframes and logos created using Canva, Photoshop, DALL·E 2 and Figma
- Model, view, Model View architecture written
- Sound files generated in house to maintain copyright integrity

Bluetooth Module
- ESP 32 Bluetooth module (~20m range)
- I2S Amplifier

Results
Goal: Withstand a bite force of 800 N (study stated that a dogs bite force 400 N was higher than 77% of dogs tested in this study, wanted Factor of safety of 2)

Compression Test
Compressed perpendicular to the threads
- Peak Load = 2.389 kN
- Peak Stress = 7.879 MPa

Compressed along threads
- Peak Load = 2.487 kN
- Peak Stress = 7.703 MPa

Next Steps
- Manufacturing
  - Outsource manufacturing to China
  - Outer layer will become natural rubber
- Electrical Components
  - Custom PCB
  - Increased battery life
  - Increase range
  - Waterproofing
- Software Development
  - Ability to add custom sounds through FetchFinder App
  - Android and iOS apps

References
4. Schulich School of Engineering, University of Calgary