

Puppy Pal



EEL 4914 Senior Design I

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Motivation

Dogs provide hours of entertainment and years of loyal companionship to their owners, but all too often have the undesirable habits of rummaging through the trash, digging holes, and chewing on household items. These habits are inconvenient to the owner and can have serious health consequences for dogs, since much of what they eat in the trash can be unhealthy and even toxic. Many owners don't realize that the root cause of this behavior is simply boredom. Boredom is easily prevented, but often occurs while the owner is away and thus can become a difficult problem to mitigate. Many people have tried to give their dog a bone or chew toy, but these quickly become uninteresting because of the monotony and lack of feedback. These problems have been addressed by squeaking toys, scented and flavored and countless others, but all fall short when it comes to long term distraction. After struggling to find something capable of long term distraction, it was concluded that only other living beings provided sufficient entertainment. Dogs will chase squirrels, lizards and even each other, but this often can't be accommodated in an urban household, so what better way to distract them than with a toy built to mimic this behavior.

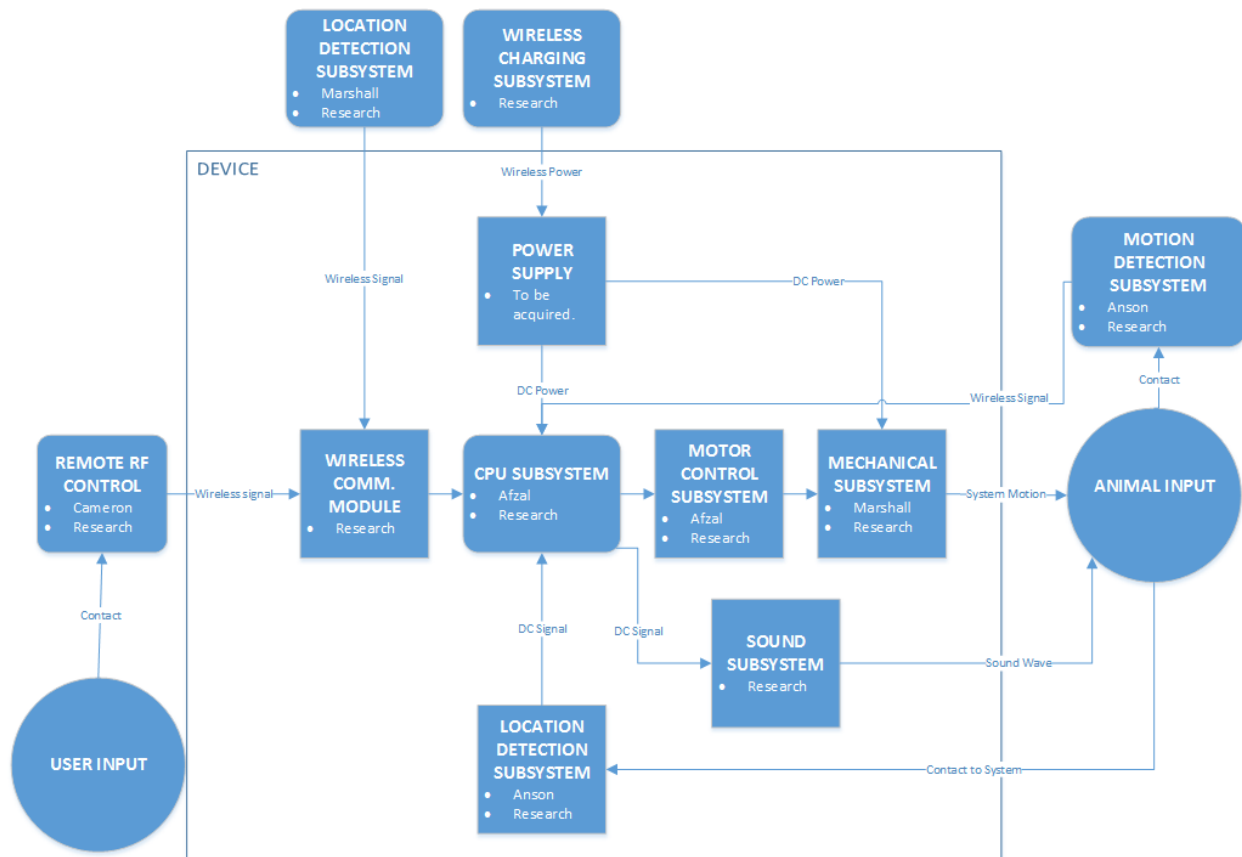
Goals and Objectives

The overall goal of this project is to provide all day entertainment for dogs to avoid the destructive behaviors that boredom causes. This requires that the device be capable of capturing the attention of the dog, and retaining that attention until the dog is tired enough to rest. The best way for this device to capture and retain the dog's attention is to simulate something that is already instinctually interesting to all dogs, another animal. The simple solution of leaving another animal for the dog to play with overlooks the tendency for the animals to play destructively together, therefore, the best solution is to simulate an animal that will only play in a safe and non destructive manner. In order to effectively simulate an animal, this device should be capable of impulsive and apparently spontaneous motion, suggesting the need for a lightweight design and a motor capable of providing quick bursts of movement. This product must be able to handle the wear and tear of everyday play while still being visually stimulating, which will be accomplished through enclosing all parts within a hard plastic sphere which will be masked with a replaceable fabric cover. The sphere is important because there are virtually no places that can be chewed on or torn off. The all day duration requires a sleep function that takes advantage of the time when the dog is napping, allowing the dog an undisturbed rest while monitoring the dog to allow for restoration of entertainment when the dog has woken up.

Project Specifications

- Speeds of 3 feet/second
- Weight of 0.5 pounds
- 60 minutes of non-stop use
- Uses Bluetooth for use within 30 feet of controlling Android (mobile) device
- Android 2.0 (API Level 5) and up compatible
- Runs of 12V, 500 mA
- Microcontroller needs 3V output
- Proximity Sensor with 3 foot radius
- Spherical with a 6 inch diameter
- Proximity sensor with 3 foot radius
- 2 12V DC motors, 3000 RPM. Dimensions of 2.5”L x 1”W

Block Diagram and Illustrations



Project Budget

Part	Cost
Computational Subsystem	20.00
Mechanical Subsystem	40.00
Location Detection Subsystem	30.00
Sound Subsystem	15.00
Plastic Ball Enclosure	10.00
Motion Detection Subsystem	15.00
PCB	55.00
Wireless Communication Module	40.00
Motor Control Subsystem	20.00
Power Supply	30.00
Wireless Charging Subsystem	20.00
Misc. Electronics	20.00
Total	315.00