LOW-PROFILE HIGH-PERFORMANCE GPS Cat Collar

11/03/2022

# Overview

## Project Background and Description

The purpose of this document is to define and describe project requirements and to understand key deliverables and the means in which they will be delivered.

This project is intended to solve a lack of slim cat collars with the ability of live cellular GPS tracking within Australia. As dog collars are usually to bulky, we aim to create a collar that is both minimalistic in design and provides live and highly accurate tracking capability.

## Project Scope

|  |  |
| --- | --- |
|  | Project scope defines the boundaries of a project. Think of the scope as an imaginary box that will enclose all the project elements/activities. It not only defines what you are doing (what goes into the box), but it sets limits for what will not be done as part of the project (what doesn’t fit in the box). Scope answers questions including what will be done, what won’t be done, and what the result will look like. |

The Low-Profile High-Performance GPS Cat Collar is a high accuracy device with a minimalistic design, aimed to fit cats with slim necklines. This device will be one of the few working Cellular GPS tracking collars in Australia and will offer real-time tracking anywhere within range of a cellular tower. Accompanying the device is a web-based tracking application which will provide real time tracking data of the collar’s current location.

## High-Level Requirements

The design of the collar itself must adhere to the following:

* Device must be slim around the cat’s neck i.e. not bulky, heaving or irritating to the cat (subjective)
* Quick side release buckle
* High quality plastic to ensure it’s resistant to physical trauma
  + Explosion proof
* Waterproof

The GPS device must adhere to the following:

* Cellular tracking with Australian carriers
  + Telstra, Optus, Boost and cheap other cheap carriers
* Must have a battery life of at least 48 hours
* May be rechargeable
  + Depending on battery size limits
* Must provide a location on request of the application
  + At all times – depending on the technology
* A microcontroller will handle the connection to a cellular tower and the transmission of GPS data to the host server
* Must have a host server to connect to and transmit GPS tracking data

The web-based application must adhere to the following:

* Must include an admin panel with access to each GPS device
* Must uniquely identify each GPS tracking device
* Client side must be able to login and retrieve only their own GPS tracking devices
* Must have secure database storage of all GPS devices and user accounts
* Map centered on Australia – zoomed into 200m of the GPS device

## Deliverables

* Slim collar made of high-quality plastic
* Rechargeable device with 48-hour battery life
* Live cellular tracking within Australia with all major and cheap carriers
* Access to multiple collars with a single account via a web-based application
  + Later a phone application

## Affected Parties

None

## Affected Business Processes or Systems

These GPS devices will not be designed for any other purpose than to fit on a cat collar, including but not limited to; cars, keychains and other animals.

## Development Phases

### Phase-1

The GPS collar will first be designed and tested as a breadboard prototype. Once satisfactory that the device will power on, development can begin on connecting the Microcontroller (Arduino) to a cellular tower (Telstra) and to a development server hosted on the internet. Once this server will receive the GPS tracking data, Phase-1 will be complete.

Included in release:

* Breadboard prototype connects to internet via cellular tower
* Arduino transmits GPS data to a web server

### Phase-2

A web-based application to transform GPS data into readable map location data will then need to be developed. Once this application can read GPS data from an external host and translate the data to a live location on a map, Phase-2 will be completed.

Included in release:

* Web-Based application that can read GPS data and transform it into a live location on a map

### Phase-3

Development on a PCB can begin, substituting the Arduino with a PCB based microcontroller and developing a functioning board that does not rely on any external power source and can achieve all requirements from Phase-1.

Included in release:

* PCB with output as specified in Phase-1

### Phase-4

Revision of the PCB to fit within the specified dimensions. More printed prototypes and testing.

* Micro-PCB conforming to size requirements

### Phase-5

The PCB casing can be designed and manufactured, as can the entire collar. Must conform to size, quality and safety requirements.

Included in release:

* Slim case for PCB
  + Attachable to collar
* Collar with quick release buckle

### Phase-6

The web-based application will need to be modified to account for user accounts and unique collar tracking. The admin page should be developed first, using the latest security protocols to prevent malicious intent and data leakage. The user page can also be developed at this phase.

Included in release:

* Web-based application suitable for rollout to public
  + Secure account creation, logins and usage
  + Secure tracking data
  + Unique collar recognition
  + Usable and scalable UI

## Implementation Plan

|  |  |
| --- | --- |
|  | Include recommendations that lead to your proposed solution. Summarize what you’re proposing to do and how you’re going to meet the goals. You’ll be able to expand on the details within the ‘Our Proposal’ section. |

Each minor development milestone is outlined below with a description of the proposed implementation plan.

##### Rechargeable Battery

Unknown

##### Waterproof Case

Unknown

##### Connection to Carrier (Telstra)

Unknown

## High-Level Timeline/Schedule

|  |  |
| --- | --- |
|  | Describe what the high level timeline/schedule will be to plan, design, develop and deploy the project. Generally, by when do you expect this project to be finished? |

Each development phase may take up to 3 months to complete.

Project end date: 11/03/2023

## Document Revisions

|  |  |
| --- | --- |
| Date | Change |
| 11/03/2022 | Initial creation of document |
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