Bird Watcher

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# Executive Summary

Bird Watcher is a mobile application that allows users to identify birds by their calls. Bird Watcher is targeted towards bird watchers who want to identify birds by their calls and record sightings. The application will work for a small number of western North American birds. The application records audio using a mobile phone and then processes that audio before sending it to a server for identification. If the phone is offline then the application will queue the identification requests until the phone is reconnected to the server. The application will give results of identification along with accuracy percentages. The application will allow users to view information on birds that they identify. Users will have the ability to record bird sightings, based on identification results. This application will run on android devices that operate on Gingerbread 2.3.3 or above.

# Project Success

Bird Watcher will use noise reduction algorithm based on adaptive temporal filtering, in order to more accurately extract the bird calls from the audio recordings. The process of bird call matching will be done by creating an “audio print” from the spectrogram of sample bird calls; these will be stored in a database connected to a server. The application will work for 30 of the more common western North American birds. The application will be able to distinguish between different bird voices in order to approximate how many different birds are singing, based on an algorithm that considers the differences and possible variations in pitch, length and notes. The applications identification results will contain a percentage of accuracy, a list of bird species that were heard, a count of individuals heard from each species, and the type of call it is. The application will provide information on birds that have been identified, such as a photo and description. After recording an audio clip with the application, the clip should be saved to the phone. The application should allow the clip to be replayed or re-identified.

# Target Market

The target market for this application is bird lovers who own a mobile phone operating Android’s Gingerbread 2.3.3 operating system or above.

# Product Backlog

1. As a bird lover when I take a walk in a forest I want to be able to pull out my cellphone and record bird songs and identify the bird songs that I hear.
2. As a bird enthusiast while I take a walk through a city, I want to be able to record bird songs with my cellphone and identify bird species despite any background noise.
3. As a bird lover, when I get the results of my identification request I want to see a list of bird species that were identified and an approximation on the number of individuals from each species.
4. As a bird lover, when I use the application I want it to accurately match common western North American birds that it is familiar with 99% of the time. It should also reasonably approximate the number of individual birds.
5. As a bird lover, if the application cannot match a bird call to a species, I want the call to be saved. If I or anyone else who uses the app ever hear another call that matches an unknown call the device should display that it is an unknown call, and information on where the call has been heard should be available.
6. As a bird lover, I should get the results of the identification within a reasonable time after the clip is sent, less than 5 seconds.
7. As a bird lover, after I have recorded a call I want to be able to save that clip and the location it was recorded at, so that I can listen to it later or identify and record the spotting later if I am offline. When I listen to the clip later I want the ability to identify its species list.
8. As a bird lover, if I am offline want to queue clips as well as the locations at which they were recorded. My sightings should be reported automatically when I get online. I want the ability to choose set whether I want this feature to be active.
9. As a bird lover, when I am planning for my next outing I want to view bird sightings on a map, so that I can plan my outing based on what birds can be found where, or find new bird places. The sightings should contain information on what bird was sighted, and when it was sighted.
10. As a bird lover, I want to contribute to the recording of bird sightings, when the application identifies birds I want the application to automatically record them and add them to the map at my current location.

# 2-Week Plan

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| Week 1 | Week 2 |
| |  |  | | --- | --- | | Day 1 | Research: Gather bird call data that will be the basis of identifying birdcalls of similar birds. | | Day 2 | Research: Gather bird call data that will be tested against the sample data, these should be different from Day 1’s | | Day 3 | Code: Create Audio Print Algorithm | | Day 4 | Code: Create Audio Print Algorithm | | Day 5 | Code: Prove that the Audio Print Algorithm works for matching | | |  |  | | --- | --- | | Day 6 | Research: find recordings of different birds doing the same call, if they are not in the same sound file combine them. Also study the sounds to see how they differ from each other | | Day 7 | Code: Create algorithm that identifies the number of calls that are from the same bird. | | Day 8 | Code: Create algorithm that identifies the number of calls that are from the same bird. | | Day 9 | Code: Create algorithm that identifies the number of calls that are from the same bird. | | Day 10 | Code: Create algorithm that identifies the number of calls that are from the same bird. | |