**What’s That Critter?**

Design Document  
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Introduction:  
  
The *What’s That Critter* application will be an iPhone program with backend cloud (server) support. This app will be used to identify different animals using photos taken by an iphone. A user can take a picture through the app, or select one from existing photos on the phone. It will use image recognition and supervised learning to make classifications for the animal in the user’s photo. Once the animal in the picture has been classified, the common name, scientific name, and a link to info about the animal appear, or a not recognized message appears. Users will need to create an account and login to use the software. Once logged in, users can start taking pictures and can decide whether they’d like to delete the photo or classify. Deleting the photo would simply mean not saving the photo. If a user wishes to classify the animal in the picture, the user clicks a button, the image will be sent to a server where the image is read, classified, and information and names are sent back to the application. Lastly, a user can decide whether or not they want to save the photo and eventually decide if they would like to link the photo to social media.

# User Stories:

1. As a user I want to use my phone’s camera to take a picture of an animal.
2. As a user I want to select a photo from my phone’s photos to classify.
3. As a user I want to be able to delete a photo, classify an animal, save a picture.
4. As a user I want to classify the animal in the photo.
5. As a user I want to know the common and scientific names of the animal in my picture.
6. As a user I would like read a short excerpt about the animal in my photo.
7. As a user I want the option to opt out of photos being saved for the classification process.
8. As an administrator, I want the ability to review photos.
9. As an administrator, I want to be able to correct misclassifications.
10. As an administrator, I want to be able to address mispredictions.
11. As an administrator, I want to be able to remove photos from the server.
12. As an administrator, I want to be able to add photos to the server.

# Business Rules:

1. The iPhone application is linked to a server via internet.
2. All prediction calculations will be done server side.
3. Users will need to create an account.
4. User will take photos and opt to send it to the server.
5. The server will carry out classifications.

# The Program

The *What’s That Critter* application is really a suite of five programs that work closely together to deliver an iPhone-based animal classification program. First, there is the iPhone application *What’s That Critter*. Then there are the server-side applications *CritterServer, CritterData, CritterClassifier, a*nd *CritterController*.

## What’s That Critter:

The *What’s That Critter* app is the flagship program that users will come to know the most. *What’s That Critter* will be the main method for obtaining new data (photos), and retrieving info from the server. The application will not contain any prediction making software. The app will serve primarily as the link between the user and the server. As such, the app will be optimized for ease of use, speed, looks, and general user experience.

## CritterServer:

The server will be built using open source software. The server will contain three main components on it. CritterServer will contain a database of photos and info on animals, the classification program which predicts the animal in the photo, and a controller.

## CritterData:

*CritterData* is a database that stores photos of animals and is organized by classification. Each classification contains photos, a common name, scientific name, and has an excerpt string that contains a brief description of the animal.

## CritterClassifier:

*CritterClassifier* is the recognition program that will be used to classify an image that is sent to the server by a user. Once a classification is made, the result is passed to the controller (*CritterController*) where the controller retrieves the associated names and excerpt and sends them to the user’s *What’s That Critter* application. Critter Classifier uses the photos in *CritterData* to make a classification of a user’s photo. The photo is then saved to *CritterData* with the appropriate classification tag.

## CritterController:

The *CritterController* is the program that ties *CritterClasssifier* and *What’s that Critter* together. *CritterController* has a communication channel with an instance of *What’s That Critter* on a user’s phone. When a user opts to classify an animal photo, the photo is sent to the *CritterServer* where it is received by the *CritterController* which then sends the photo to the *CritterClassifier*. *CritterClassfier* then makes a classification based on the photos and classifications in *CritterData* and returns the results to the *CritterController.* The *CritterController* then retrieves the names and excerpt of the class and sends it to the user’s instance of *What’s That Critter* where the data is displayed on the user’s phone.