

DEPARTMENT OF COMPUTER SCIENCE
COLLEGE OF ARTS AND SCIENCES

CSCI 4961/4962 Capstone Project Plan

Title of Project: New Roots for Restoration

Client: Dr. Allison Miller

Supervisor: Dr. Abby Stylianou

Student(s): Hamad Khan, Julia Pratt, Alexander Juan

Project Overview (1 page max):

In plant biology one of the most important tasks is taking in field measurements of plant physical properties -- this is called “phenotyping” and includes things like measuring plant height, number of leaves, leaf angle, whether the plant is exhibiting plant stress, etc. This can be a challenge, especially when you have many different individuals at many different field sites taking measurements and recording them -- lack of standardization, hard to ensure that everyone is measuring the same thing.

Goal of this capstone: design a smartphone application that will help to streamline the process outlined above. We will be able to collect information on field locations as well as the plants in that plot. This will be done through QR code identification. After the QR code is scanned, all available surveys for that plot will be shown to the user for them to fill out. We are hoping to include images (for the researchers to upload) as well as text within the survey.

These responses to the survey will be recorded in a database. They will be easily accessible to researchers later. The database must have an option to modify the data in case there is faulty data.



Figure 2: Different fields where the app would be used by researchers.

Figure 1: An example of a QR that the app would scan.

Goals for Deliverable #1:

- Explore options for opening a survey within an application. Needs to be able to be fed pre-populated fields. Default assumption is that Google Forms will be a good solution, but we want to be sure that's true.
 - Driving consideration: What's the simplest option that will be easiest for team biologists to create new surveys and have them available in the app?
 - We can mandate that every survey will include fields named site-name and plot-number (the information we want to get from the QR code).
 - For whatever platform that is picked, document the process (api) for pre-populating fields.
 - Design application wireframes that show interfaces and functionality
 - Design a basic login screen.
 - All the wireframe pages -> actual pages on the app.
 - Choose the framework we plan to use and get familiar with it (react, swift, objective-c).
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Goals for Deliverable #2:

Scanning a QR code to open a website within the application (i.e., within a web view inside of the app)

- Develop a more formal version of the application that implements the wireframes from Q1 and opens actual surveys (w/ info from the QR code).
 - Retrieving a list of ~5 possible survey links (Google or otherwise)
 - Allowing a user to pick a survey from that list.
 - Open the survey, pre-populating the site-name and plot-number fields from the QR code.
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Goals for Deliverable #3:

- Have a preliminary, working version of the app.
 - Continued development, application development, and feedback collection.
 - Give the prototype of the app to researchers so that we can get feedback.
 - Connect the database to the app.
 - Must be extremely simple/accessible so that researchers without technical knowledge will be able to access it and run queries on it.
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Goals for Deliverable #4:

- Iterate on feedback, potentially incorporate image capture functionality, and add an 'offline' mode.
 - The purpose of the offline mode is such that when researchers don't have any cellular data in the fields, data that they have already collected will be cached/stored and can be uploaded when data is available.
 - Have a bug-free, fully working version of the app.
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Signatures

Students: Hamad Khan

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Supervisor:



Instructor:
