Mobile App for Wildlife Data Collection and Query

PIs:
Heather Bateman, Assistant Professor, Department of Applied Sciences and Mathematics, Arizona State University at the Polytechnic campus

Timothy Lindquist, Professor, Department of Engineering (computing), Arizona State University at the Polytechnic campus

Richard Whitehouse, Senior Lecturer, Department of Engineering (computing), Arizona State University at the Polytechnic campus

Mark-recapture approaches are often used in the management and conservation of wildlife species to estimate populations and survival. For example, over 2,000 studies have been published in the last 5 years using mark-recapture methods. These methods are used by academics and government agencies (e.g., US Geological Survey, US Fish & Wildlife Service, and US Forest Service). Effective approaches to estimate populations rely on accurate data collection techniques. Our proposal is for the design and enhancement of a mobile application (app) for field-collected data from a mark-recapture study on herpetofauna. Our app is developed for mobile devices, including the Android and iOS platforms. Both platforms have similar user interactions via data entry on a touch-screen using pre-programmed fields, checkboxes, drop-down menus, and keypad entry. Our app includes features to insure collection of all measurements in the field through pop-up messages and can proof entries for valid formats (e.g., app will not allow text entries in number only fields). The beta version of our app allows the user to query a database in the field to view histories of previously captured animals. Having access to capture histories allows the user to catch potential errors when the animal is being processed in the field, instead of realizing a mistake back at the lab at a later time. The app stores field-entered data on the device or memory card and then will sync to an online database via the Internet.

Our project is significant because, to our knowledge, this is the first app developed for mobile devices for biologists using mark-recapture techniques (Fig. 1). Our app can be easily adapted for use with other wildlife species and projects. This mobile tool will allow biologists to collect data in remote settings, reduce data errors, standardize documentation, and eliminate time consuming data-entry and proofing steps.

Our proposal seeks funding to improve our app and increase its adaptability to similar projects with the desired outcome to provide the app to users via the Internet, such as the Android Marketplace or iTunes. With funding we could improve the app by (1) increase the app stability and resolve syncing issues with an online database, (2) enhance a web application for accessing and editing the online database, (3) develop a web interface to allow users to customize the app for different studies without changing software source code, and (4) make the app widely available for minimal download cost (e.g., $1.00 per download).
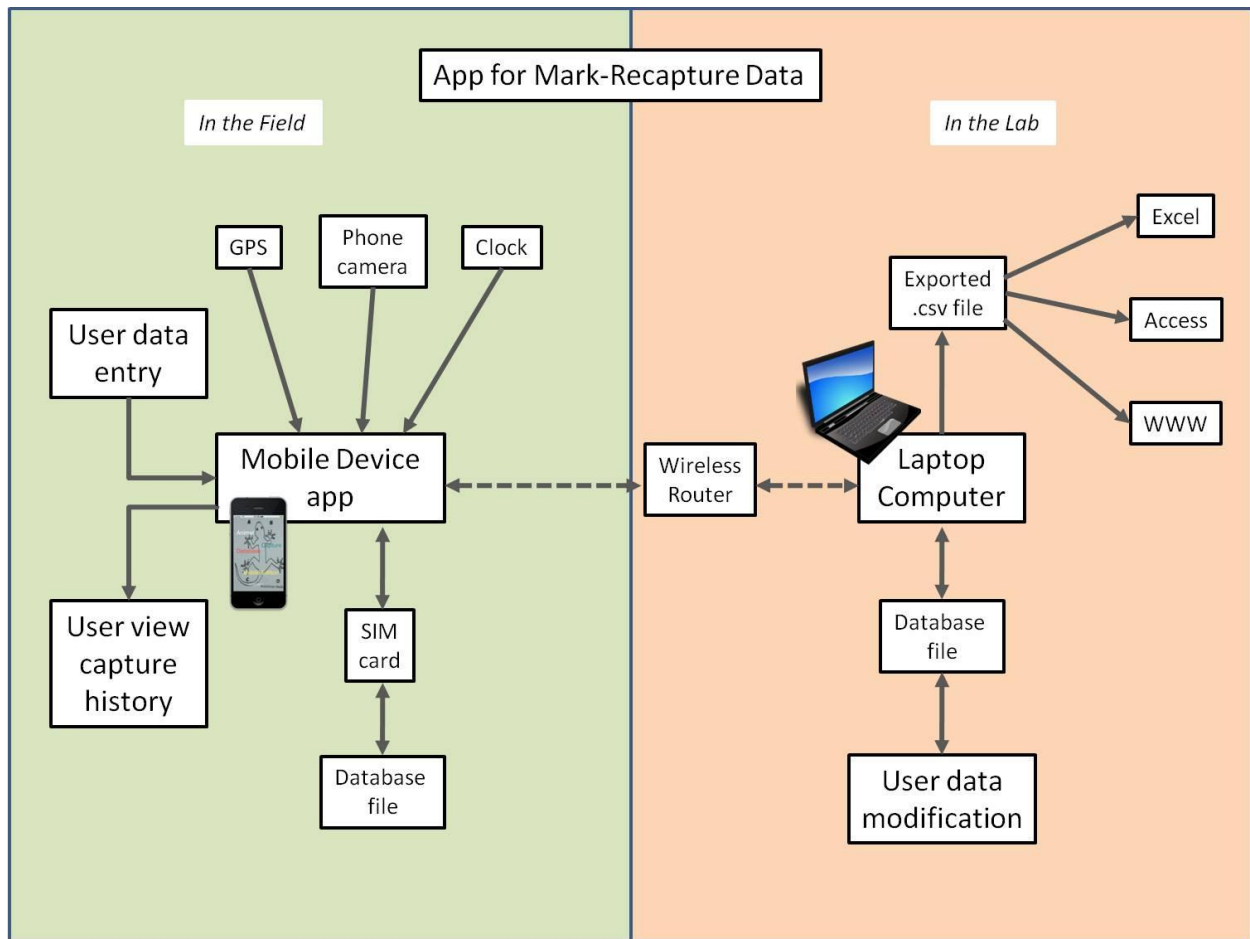
Fig. 1. Development of a mobile app for mark-recapture studies. The app is used to collect data in the field or remote setting and then will sync with an online database to update the database with is stored both online and on the mobile device.