

# Android Development—Campus Tour Application

## Coding Team: Banana Panic

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## UA Campus Tour

This poster describes an Android application that will guide a user around campus and give them important details about buildings and other landmarks. Some of the information provided by the application is historical, but primarily focuses on campus navigation, types of classes offered and labs available in each building, and details about campus libraries. The application also provides a photo gallery of each building on the tour and an audio-video library that links users to external sites (e.g., YouTube) to view multimedia associated with each campus landmark. The application is driven by GPS capabilities that help track the user location across the tour landmark sites.

Users can take an Android device to the university for a guided tour, or use the application off campus to freely browse the map and list of properties on the tour. The app also contains a search function to allow users to see a full list of buildings and drill down to look for a specific name.

This application offers a competitive incentive for recruiting, so our primary target audience is prospective students. The application allows students to take a self-guided tour of the campus without an ambassador present. From their home, students also can take a virtual tour of campus without actually visiting campus. This dual purpose application helps relieve scheduling strain on campus ambassadors who normally offer tours, and simultaneously makes it easier for prospective students to get information about the university. In addition to the GPS tracking of the campus location, the app also has a feature to provide text to speech capabilities that will read aloud the description of each campus landmark. This feature may serve a group of students who want to listen to the audio summary from a single phone.

## Android has maps, why build another?

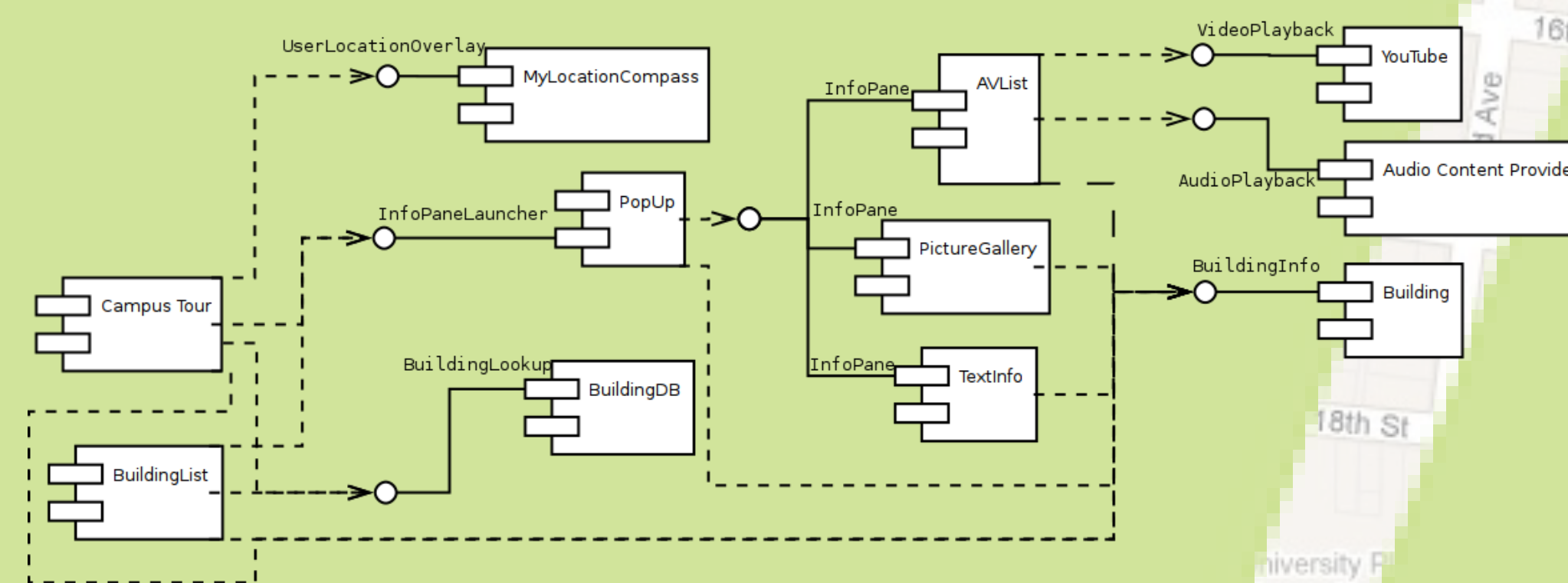
Our application is built on top of the Google Maps External Library for Android that is available on current Android phones. The Campus Tour app offers a custom tailored map focused on touring the campus, with extensive details and multimedia in a manner that is not possible with standard Google Maps.



## How does it work?

The API provided by the Google Maps External Library was a great asset, but we had to create overlays (custom drawing layers) to implement functionality over the most basic map provided by the API.

The buildings, GPS locations, pictures, videos, and audio clips all had to be stored on the device, so we built a database to store this information locally. Mobile phones typically have very limited local resources. In order to alleviate this issue we chose to keep video and audio resources out of the database, and link to outside sources such as YouTube. This helps to ensure the application footprint does not grow exponentially to contain video footage and audio files for each building. Web hosted files also allow the application to maintain a robust collection of information without getting too large. As a result, the database primarily stores text, GPS coordinates, and pictures.



## Android Platform

Android was chosen as our development platform for the following reasons.

- Open Source Platform
- Google Maps API
- Text-to-Speech
- GPS/Location Based Services
- Large User-base

In addition to the platform's robust features, Android also presented several challenges. During the development of this project, we discovered the difficulties of developing to a platform that is deployed on heterogeneous hardware devices with different capabilities. One challenge was building the application so that it looks consistent on a variety of devices. Displaying a map on phones and tablets with different screen sizes required consideration of a variety of screen resolutions, and adjusting the views dynamically depending on the device's display parameters.

Furthermore, even though Google provides a static Maps library, a developer does not get full access to the features and elements included in the full release version of Google Maps. Some functionality must be recreated from scratch. For example, the Campus Tour app requires the creation of an arrow to show the user's current direction, and another to indicate which direction they need to travel to reach the next point of interest.

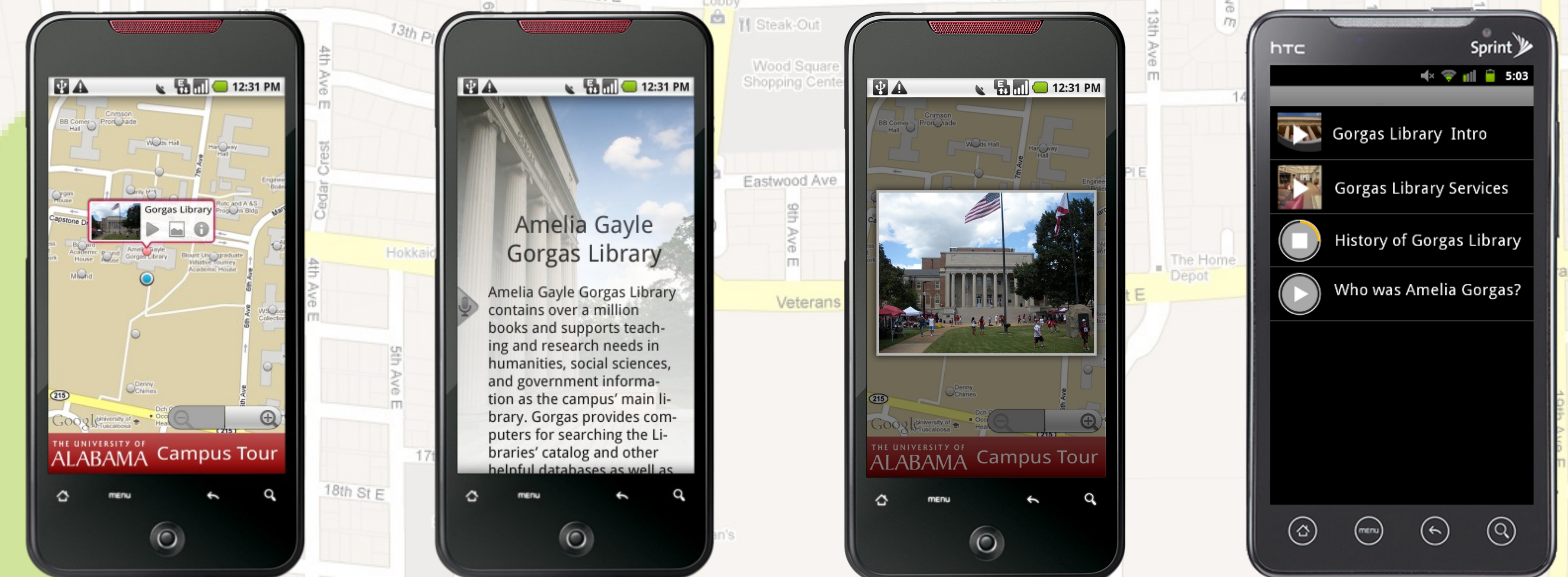


## Future Development

In future versions of the application, there are several additions that we would like to add, but the final step for the Campus Tour application is a transformation into an open framework. Our vision is to release an extensible platform, and possibly a second application (Tour Maker) so that other campuses can tag their buildings, fill in their information, and link informational media to the map.

This would be useful for organizations other than universities. We foresee it being used by anyone that wants to map out an area and provide more information for navigation purposes. The application can also be used to create tours of non-urban environments such as a nature walk or zoo. The goal of is to design a framework that allows an average user to build their own tour.

The open source nature of the project means that our work is a community service. When we stop development of the software, others can take our source code and continue building indefinitely.



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