



GeoNotes Splice Extension

Tags: App Development, Android, Java, Agriculture, GPS, Autonomy, Vehicles, Tools

Team: 2-5 people

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The Company

Trimble is a Fortune 500 technology company with a diverse array of projects and products. Trimble software, hardware, and services are transforming industries such as agriculture, construction, geospatial and transportation and logistics. Trimble has over 2,000 worldwide patents as well as research and development centers in more than 15 countries including 3 in Colorado (Westminster, Boulder, and Englewood).



The Project - GeoNotes Splice Extension

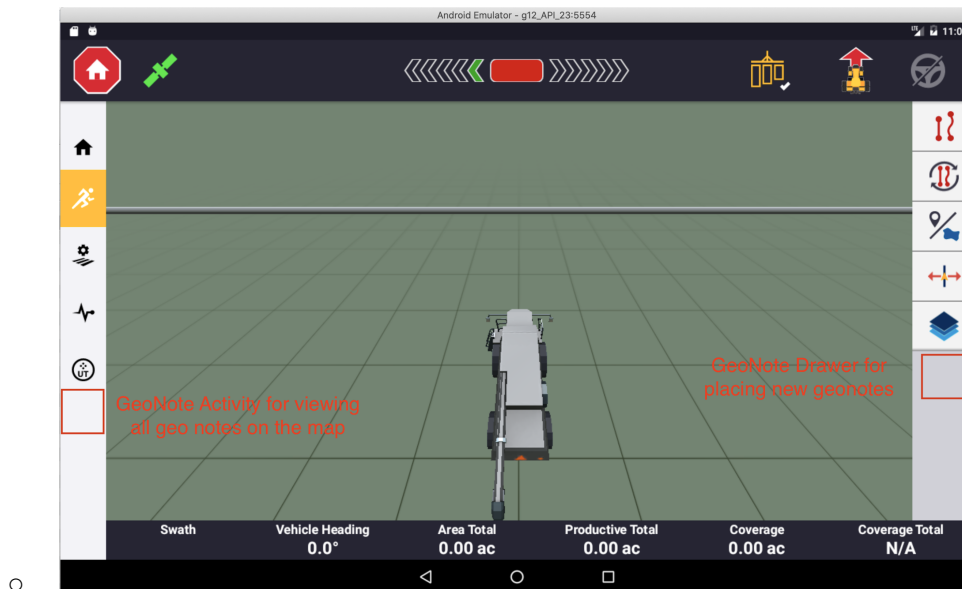
Much development effort in Trimble Ag is focused on the in-tractor displays. These Android based devices (coupled with Trimble GPS and AutoPilot packages) allow for different levels of control and a wealth of information relevant to the farmer accessible from a tablet. Trimble Ag is currently developing Splice, a library and API that allows 3rd party developers to build extensions to the primary precision farming app, Precision-IQ (PIQ).

Your task over the 5 week field session is to build a new Splice Extension and provide feedback on the Splice API. This application's goal is to allow farmers to drop geospatial icons as reminders to the farmer to return there at a later date and address an issue. Issues could be

anything from a piece of trash to a dangerous hazard. The application also must provide a map the farmer can look at to see their previously dropped notes.

App Requirements

- Application is a Splice Extension (a specialized Android App)
- Application has a SQLite database for storing geonotes, their type, time of creation, and GPS location
- Application has a UI to view and delete placed GeoNotes
 - Implemented as a Fragment
 - Operator can look at specific notes and their timestamps with a click
 - Operator can delete a note
- Application has a UI on the runscreen that allows the operator to drop a GeoNote at the current location of the tractor.
 - Implemented as the Fragment inside a RunScreenDrawer (com.trimble.ag.splice.ui.RunScreenDrawer)
 - Fragment has an icon of for each type of GeoNote [trash, hazard, product (haybale), animal, equipment, spill, water hazard] which can be tapped to create the GeoNote



Definitions and Tools

- Precision-IQ
 - The main tractor control application that is run on Trimble tractor displays
 - Gives the operator the access to information and control of the tractor
 - Hosts various UIs to assist the operators awareness
 - You will be given a simulation version that allows you to run PIQ on an emulated display on your computer
- Splice API

- Splice API or splice-api.jar is Trimble software that offers a number of methods and classes for an Android Application to interface with PIQ. This often takes the form of Java interfaces that can query PIQ for the current location of the tractor, or classes that allow an android fragment to be displayed in the PIQ application
 - The API docs you will be given elaborate on all the methods, classes, and interfaces it provides
- Splice Extension
 - A Splice extension (or Splice application) is a specialized Android application that utilizes the Splice API extensively. It can run as a standalone Android Activity, but has additional components that integrate and run with PIQ. At the very least it contains an Extension (com.trimble.ag.splice.Extension), a SpliceFragment (com.trimble.ag.toolkit.ui.SpliceFragment), and some extra information in the AndroidManifest.xml file pointing to those classes and containing more information about the extension name, designer, etc.
 - When PIQ opens, it discovers any Splice Extensions on the device and lets the operator choose to enable any extension they want.
- Android Studios 3.6
 - Android development environment version that is compatible with both PIQ and Splice Extensions
- Splice Extension Examples
 - A set of example Splice extensions, most of which you should be able to run before development
 - Implementations of most of the features of Splice API and all their source code that will help you as reference