Tau System Executive Summary

The Tau System, consisting of the Tau App for Android and three script-enabled Google Sheets, lets puzzle coordinators manage large deployments by automatically collecting ground truth to assess DTECT system performance. The Tau system serves the following functions:

- Collects and stores time and GPS location data from puzzle QR scans
- Keeps track of user score on puzzle hunt
- View user current position and puzzle locations
- Shows leaderboard of top scorers
- Allows users to submit and check answers

The following figures provide a high-level overview of the code architecture involved in managing the puzzle hunt.

Tau App Overview
The Tau app manages the user's puzzle hunt experience. It guides the user through the puzzle hunt while logging "ground truth" position and time data. This information is collected when the user scans QR codes at precisely known puzzle check-in locations. Data scientists can then improve nuclear threat detection algorithms using a labeled dataset that corrects for GPS error.

Scoring
Displays the user's total score and points in each category and indicates whether a user is "active" or not by displaying a green or red box. Pushes the user's locally accumulated points to the cloud score database.

Answer Submission
Users select a puzzle from the drop down menu, and submit their answer. It is checked against the cloud answer database, which returns whether the user was correct or not and awards points accordingly.

Cloud Database
A set of three web-app enabled Google sheets functions as the database, which can be accessed via Json requests from the app. One Google Sheet manages scores, another logs QR scan information, and the third handles puzzle answer submissions.

Leaderboard
Lists the top five players and their scores from the cloud scoring database.

Maps
Shows the user's current position in magenta, the locations of the puzzles in yellow, and the locations of the bonus QR codes in green. Positions are pulled from the locations database in the cloud.

QR Code Scanner
Provides QR code scanning functionality. Awards points based on the scan, and reports the time, position, and stop number to the ground truth cloud database.

Figure 1: App architecture. Each page is implemented with an Android Activity, and interactions between the app and the Cloud Database are handled with JSON requests.
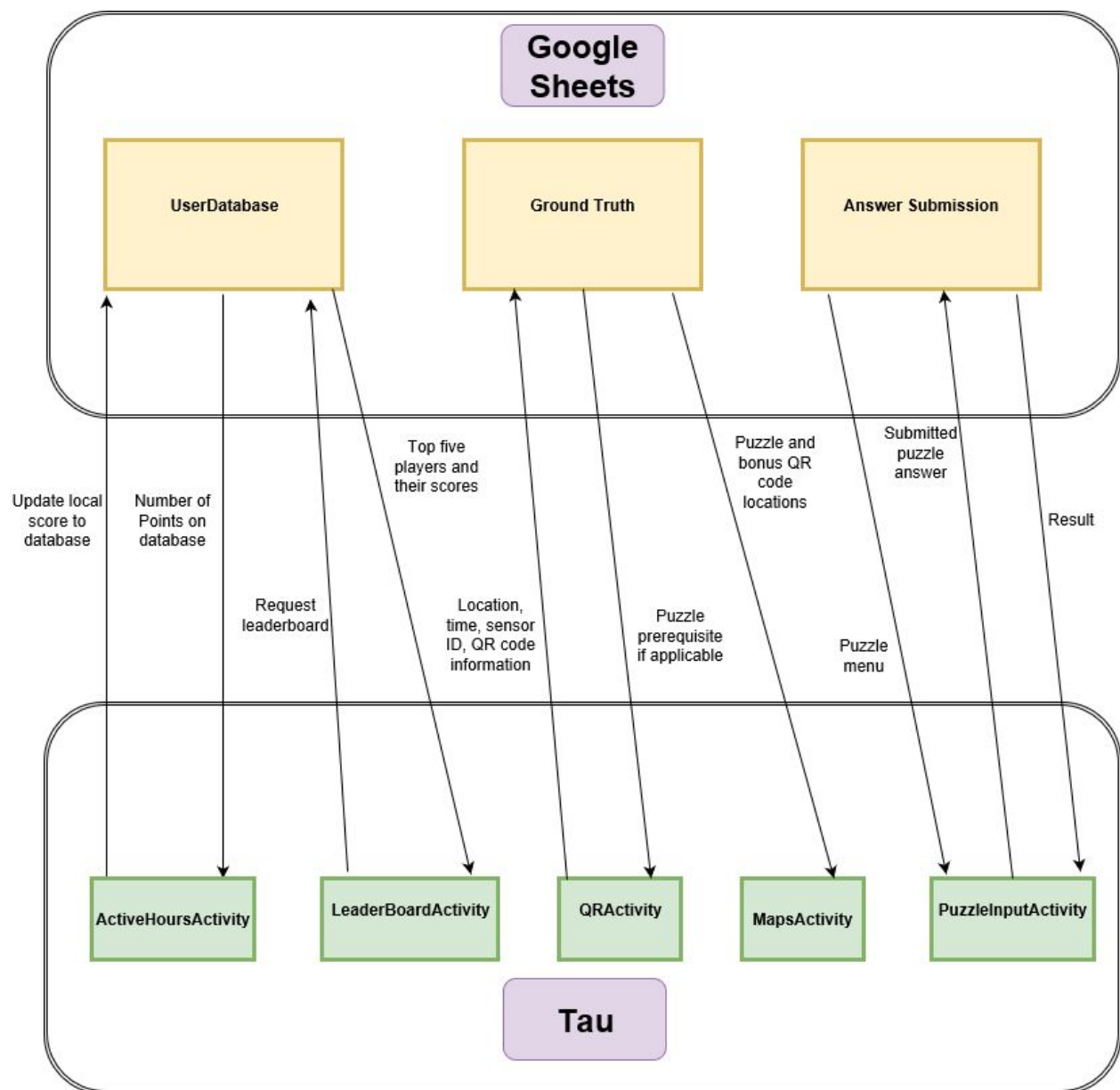
Figure 2: JSON request interaction between Tau and Google Sheets. Three separate Google Sheets receive JSON requests from different activities of the app through paired Google Scripts. See Figure 1 for the an overview of Activity contexts for JSON request submission.