F1 Sim Engineer

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***Overview*—F1 Sim Engineer is a companion Android application for the PC/console sim racing game F1 2019. *F1 Sim Engineer* allows you to obtain and display live information while playing the game and furthermore allows you to store your racing data from sessions. This data can then later be retrieved and viewed**

I. Introduction

THE proposed mobile application is intended to be used as a companion application for the PC/Console Sim Racing game F1 2019. We wanted to develop an application which would display live information in a dashboard view while the user was playing the game. The application would also be able to store the data after a race or practice session. The user would then be able to easily navigate to each session where they can see a summary of their session's data.
The app contains the following functions:

1) Obtain UDP packets sent from the game.
2) Displays real time telemetry information in the form of a car's dashboard.
3) Store session data that can be reviewed later. This consists of only some selected data being sent from the game like lap times, car type, tyre information and session details.

II. Related Work

Before getting into the development phase, we first set out to look for any similar applications to see how they functioned and what features they had. The most common found applications were simply displaying live telemetry information. These applications supported multiple PC/Console games and retrieved their data using the UDP protocol to then display the live data. Most apps supported multiple templates and also customizable templates. However, none of these apps actually stored any of the game information that could be analyzed. There was only one mobile application that we could find that actually stored the game data and provided graphs, charts and textual information of the data. However, this application lacked the live telemetry feature and instead showed a colored screen when the application was actually receiving data. Although these applications provide the same features that we intend to include, none of them actually have both live telemetry and data analysis. Our proposed application is set to bridge this gap and to include both of these features in one package.

III. Application Design

In order create the best companion application for the F1 2019 game, our application would need to collect both live telemetry and store data for analysis. To accomplish this, the F1 Sim Engineer application has three main activities for the user to access: Dashboard, Analysis and Settings. Where the dashboard would be the live telemetry, the analysis is where the user could access the stored game data and the settings page for configuring the connection to the game.

A. Opening the application

When the user accesses the application they are brought to the main screen that offers three options: Dashboard, Analysis and Settings.

Fig. 1: Main Screen

B. Dashboard

The dashboard displays real time telemetry information in a F1 display styled view. Here, you will be able to view your speed, race position, number of laps, gear, lap time, fuel remaining, weather, tyre compound, DRS activation, best lap time, last lap time, and tyre health. If you choose to leave the application you will be prompted to select one of three options; save the session information, return to the dashboard view or exit without saving. If a race or session ends in the game, then the session data will be automatically saved.

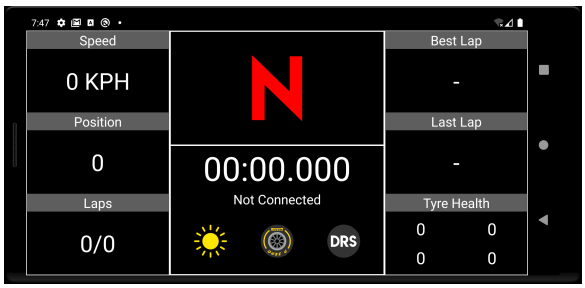

Fig. 2: F1 style dashboard view

We are able to obtain this data by receiving UDP packets that are being broadcasted by the game over WiFi. We receive these packets and unpack them to determine what type of data is being received (e.i. motion data, session data, telemetry data etc.) and display or store the data.

C. Analysis - Track Overview

One of the main goals with the application was that the user should be able to save and retrieve the sessions. We decided the best way for the user to find the different session was to store the session under their respective tracks. So, we generate a list of tracks in a card based recyclerview. We decided to do it that way because we have images and data we want to display in a consistent look which you can see in Figure 3. When you click on a track you will open the session overview for that specific track.

Fig. 3: F1 Sim Engineer Track Overview

D. Analysis - Session Overview

The session overview screen which can be seen in Figure 4 is also based on a recyclerview with two spinners for filtering and sorting. These sessions can be clicked and a session view will be opened. Here it is possible to see even more data about the individual session along with visual images and graphs. These graphs are currently static and were hardcoded due to time constraints. The result can be seen in Figure 4

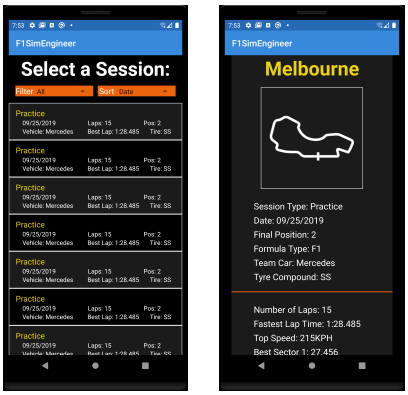

Fig. 4: Left: Session Overview. Right: Session information breakdown.

E. Settings

The settings view allows you to see your device's IP and allows for the option of changing the port to communicate with the game.

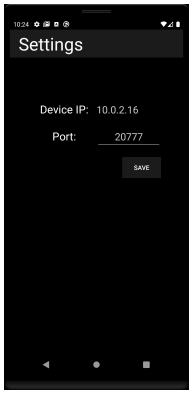

Fig. 5: Settings page

IV. Future Work

Even though this is our final iteration of the application, there are still many features that we would like to implement and improve on. This following list contains some of these improvements and additions.

1) Make it possible for users to create an online account and login in.
2) Store the data in an online database instead of locally.
3) Add extra information to be stored.
4) Add different dashboard templates.
5) Add the ability to save and view online users data if they allow it.
6) Make it possible to filter tracks and sessions.
7) Generate graphs that show a visual depiction of the data.

V. Discussion

Overall, the application works as it was intended to. We are able to obtain real time data from the F1 2019 game, display it in a dashboard view and save the data to a local database. Some features were abandoned during the project's development due to time constraints or limitations but this still did not affect the overall goal. There are still certain features that need to be polished and completed if the application was to be made available to the public. Nevertheless, the application is close to being fully completed and has bridged the gap between being able to view live telemetry data and storing information for later review.

VI. References

- F1 2019 UDP Specification. Accessed November 2019. https://forums.codemasters.com/topic/38920-f1-2019-udp-specification/
- Android API Guide. Accessed November 2019. http://developer.android.com/guide/index.html
- Collection of f1 racing tracks Vector. Accessed November 2019. https://www.freepik.com/free-photos-vectors/car
- F1 Wallpaper. Accessed December 2019. https://i.imgur.com/hIYWkCu.jpg