BRAUDE
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DRIVING LESSONS SIMULATOR

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Project Objective

Minimize the gap between theoretical and practical driving experience and create correct driving habits for future drivers

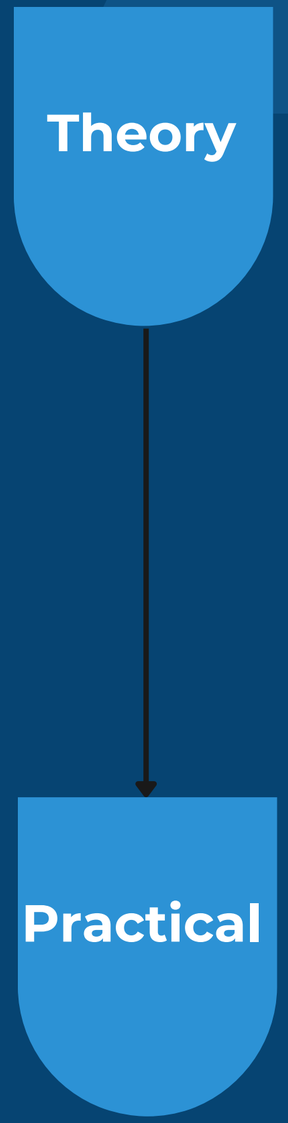
The Problem

- **Theory to practice**

- **Lack of exposure to critical real-world scenarios**

- The need for a **controlled environment** to:

1. Practice skills without risk
2. Experience diverse of driving scenarios
3. Develop reflexes and decision-making abilities



Our Solution

A driving simulator equipped with a wide range of features aims to enhance the user experience by replicating real-life driving situations with exceptional accuracy and realism. This guarantees an immersive and educational experience for all users.

- **Control of weather conditions**
- **Control of road traction**
- **Customized Scenarios**
- **Replay system**
- **Analytical system**

Instructor Created Tracks

Instructors play a crucial role in the driving simulator project by creating custom tracks/scenarios tailored to specific training objectives.

- **Design tracks with different configurations.**
- **Flexibility and creativity**

Replay Functionality

The replay feature allows users to review their driving sessions and gain valuable insights into their performance. Benefits of the replay functionality include:

- **Analyzing**

Analyzing driving techniques and behaviors in real-time. Identifying areas for improvement and practicing specific maneuvers.

- **Enhance Learning**

Enhancing learning and skill development through repeated analysis and practice.

User Rating System

The user rating system enables users to provide feedback on tracks based on their perceived difficulty levels.

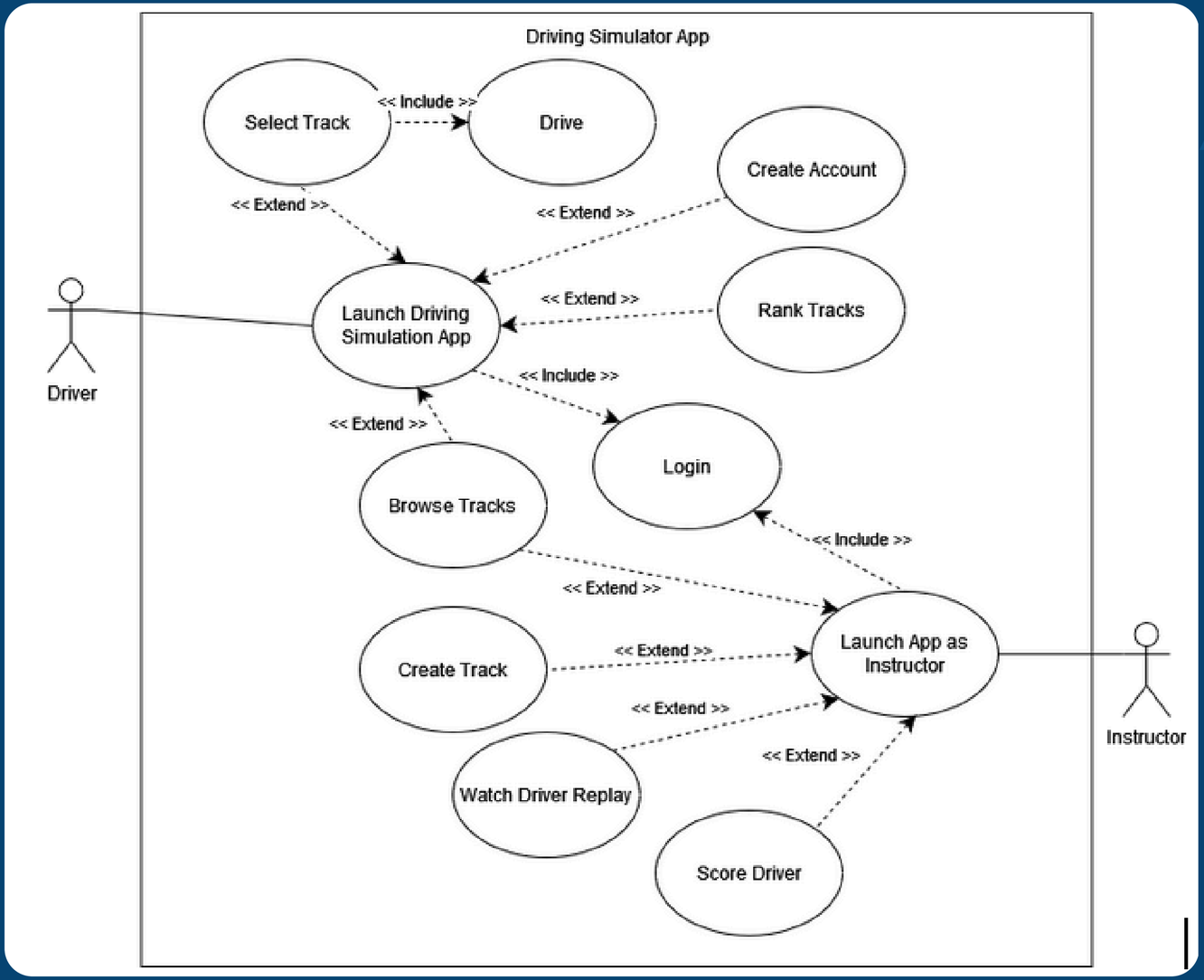
- **Valuable feedback**
- **Empowering ratings and reviews.**

Implementation Overview

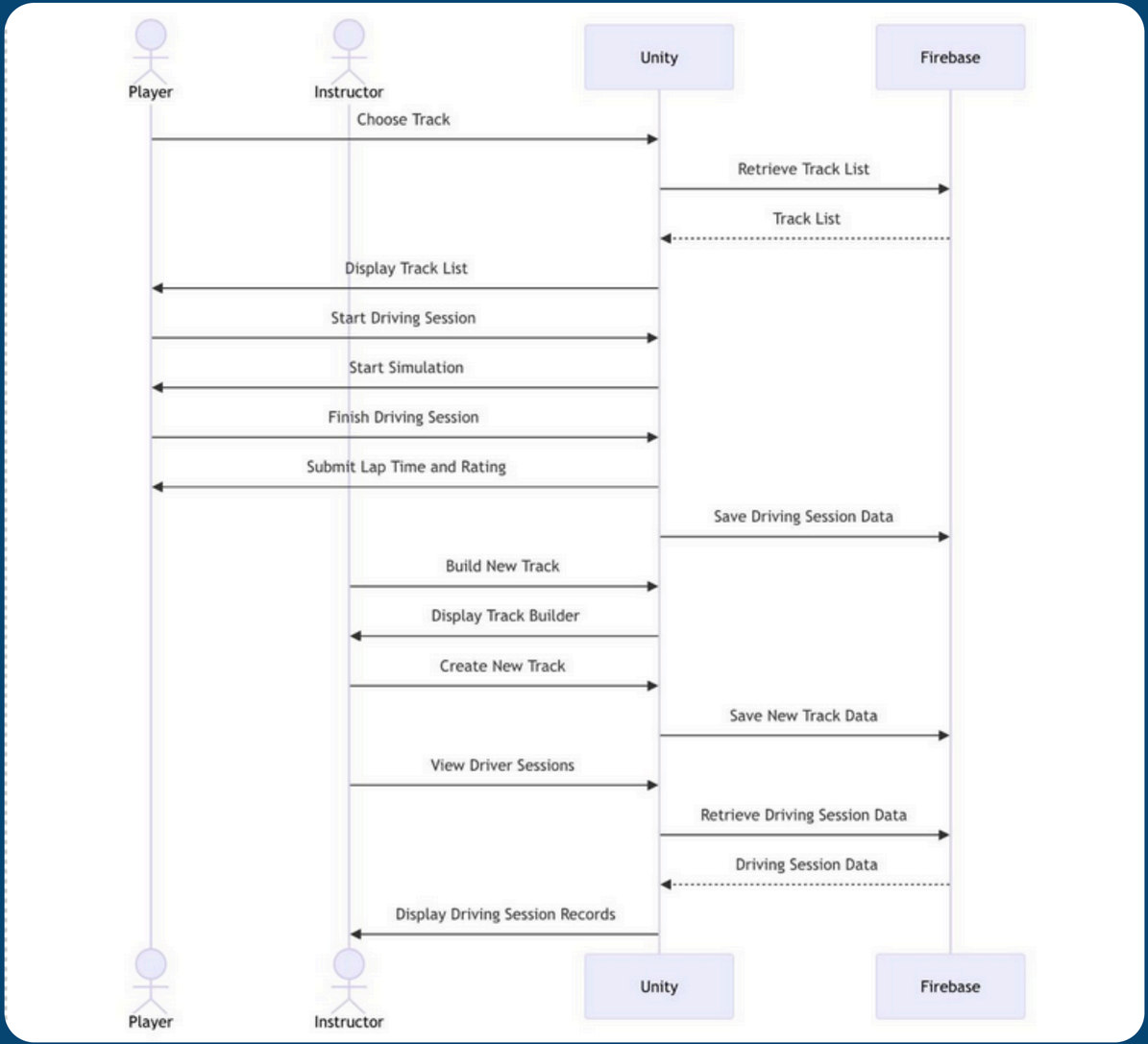
The driving simulator project is implemented using a combination of technologies and frameworks, including:

- **Unity Engine**
- **Firebase SDK**

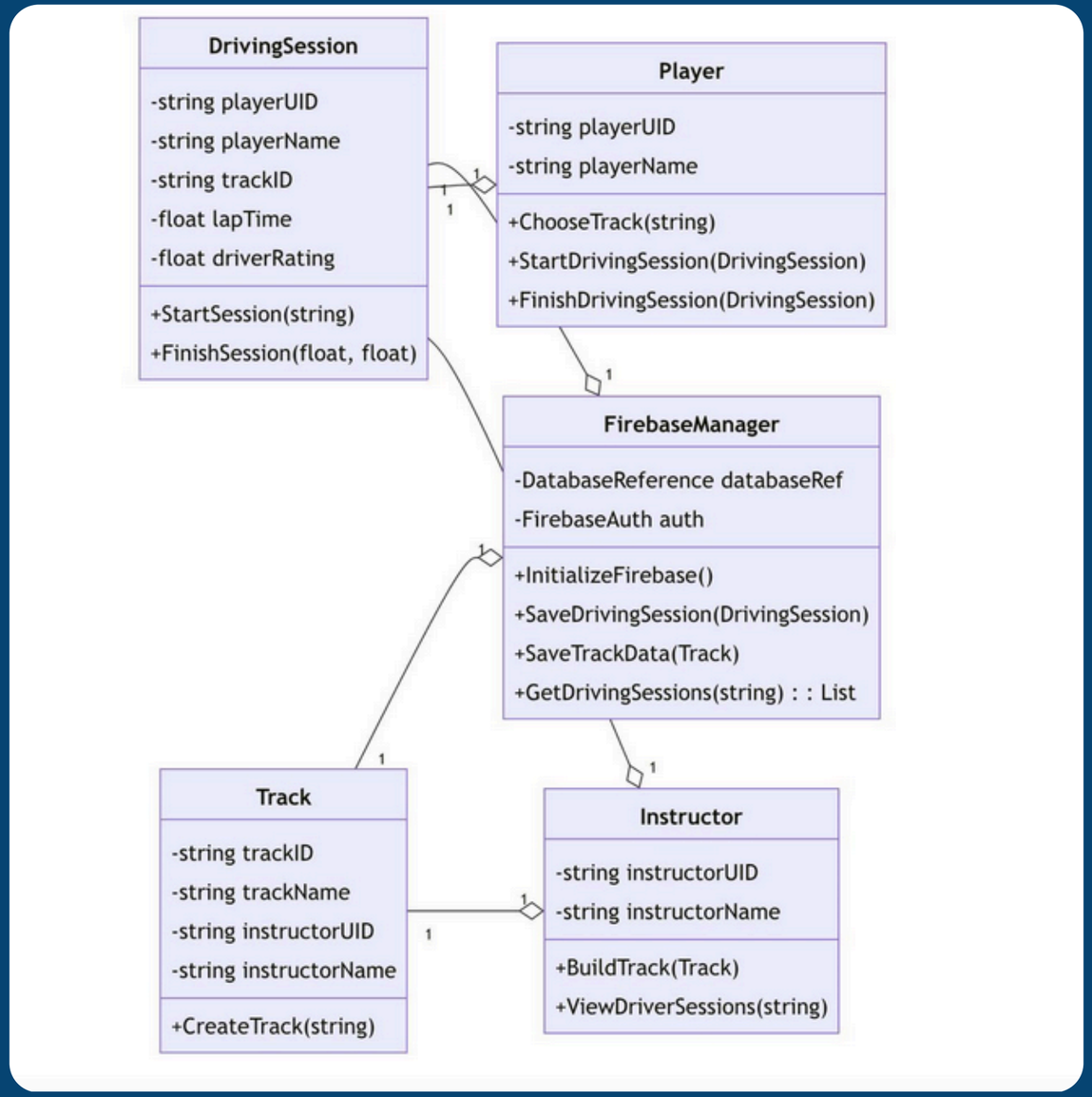
Use-Case Diagram



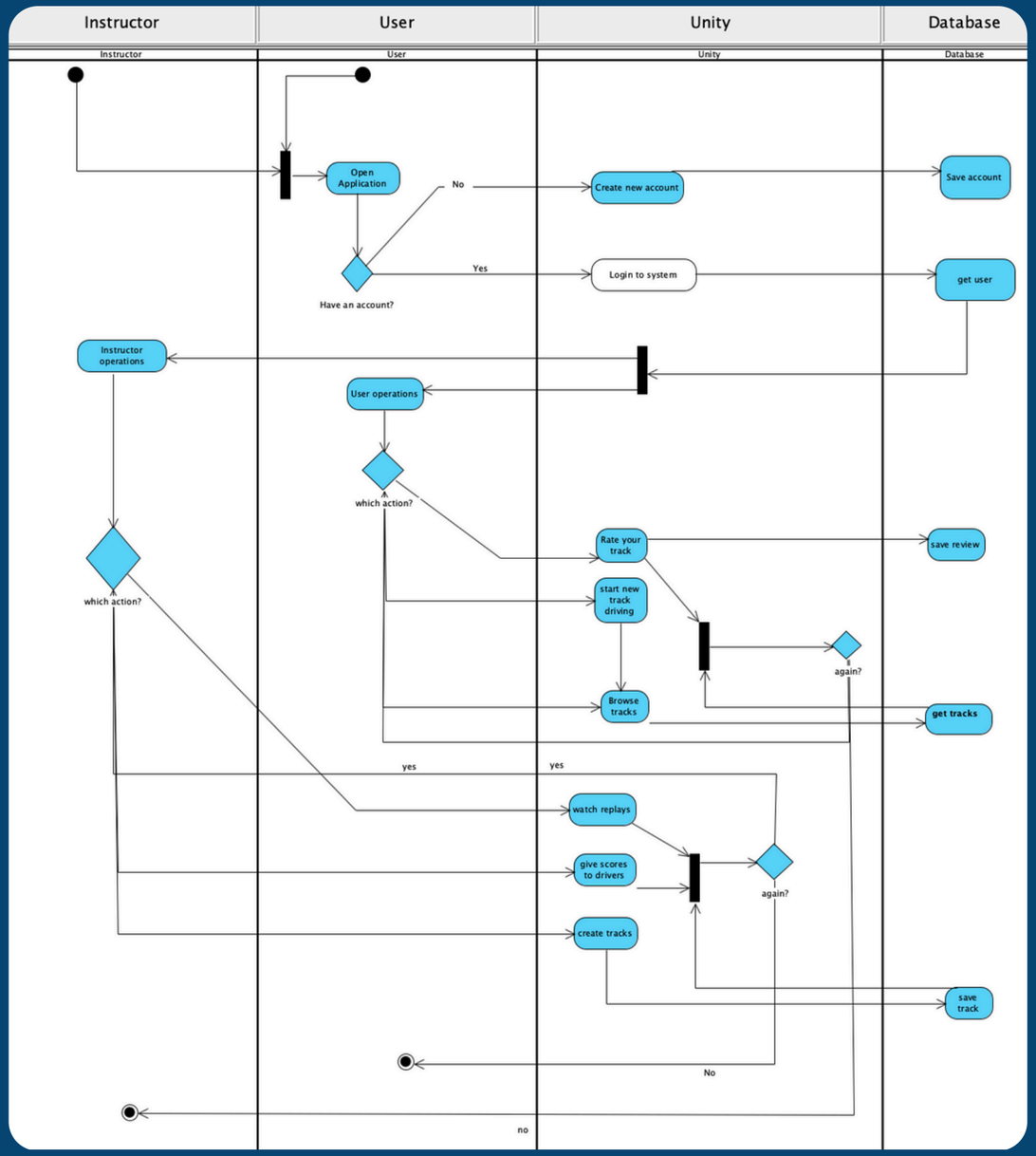
Sequence Diagram



Class Diagram



Activity Diagram



Challenges

- Data Management Structure
- Realistic Simulation

Evaluation

- Car control replication and driving conditions
- Assessment of custom track creation tools for flexibility and ease of use
- Integration of Firebase for data management and synchronization
- Consideration of scalability, data security, user interface design, accessibility and stability.

Verification

Test Case ID	Description	Expected Result
TC1	Simulate acceleration in the car controls	The car’s speed increases
TC2	Simulate braking in the car controls	The car’s speed decreases
TC3	Simulate steering in the car controls	The car changes direction
TC4	Simulate gear shifting in the car controls	The car’s gear changes
TC5	Change the environment to ‘rainy’	The road surface becomes slippery
TC6	Change the environment to ‘sunny’	The road surface is normal
TC7	Create a track with a specific configuration	The track is created and matches the specified configuration
TC8	Save a custom track	The track is saved successfully
TC9	Load a saved custom track	The loaded track matches the saved track
TC10	Attempt to access user data without proper authentication	The system prevents unauthorized access

Conclusion

Our proposed solution aims to connect theoretical knowledge with practical driving by offering added value like unique scenarios, customization, feedback, and a controlled and safe environment.

THANK YOU