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Lap Logic

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01 Motivation

The idea for this project was born out of a shared passion for cars, racing, and data-driven problem solving. In real-world racing, drivers rely on the physical sensation of g-forces to understand how their car is performing. Sim racers, however, lack this physical feedback, making it harder to judge speed, acceleration, and cornering dynamics. Our motivation is to bridge this gap by creating a telemetry tool that provides clear, actionable insights to help sim racers improve their performance. We believe this tool can not only enhance the racing experience for beginners but also provide advanced racers with deeper analytical capabilities to refine their skills.

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02 Background

Sim racing has seen explosive growth in recent years, fueled by advancements in simulation technology and the rise of esports. While many telemetry tools exist, they often cater to experienced racers, leaving beginners overwhelmed by complex data. Our project aims to fill this gap by developing an accessible telemetry tool that balances simplicity and functionality. Drawing from our diverse skill sets in data analysis, software development, and user experience design, we've built a functional prototype capable of collecting, storing, and visualizing telemetry data. By focusing on both performance metrics and usability, we aim to support a wide range of sim racers in achieving their goals.

Research

Our research played a crucial role in shaping the development of this telemetry tool. By exploring studies, industry reports, and user feedback, we identified the key features and insights needed to enhance the sim racing experience:

- **Performance Metrics:**
  - Research on AI-driven racing systems emphasized the value of metrics like throttle application, braking efficiency, and lap consistency. These findings informed the core data points we prioritized for collection and visualization
- **Racing Line Optimization:**
  - A study on dynamic computing demonstrated how optimized racing lines in simulators could significantly improve lap times both virtually and in real-world scenarios. This research guided our inclusion of actionable insights to help users improve their performance
- **Sim Racing Market Growth:**
  - Industry reports highlighted the rapid growth of the sim racing market, driven by esports and advancements in simulation hardware. This validated the relevance of our tool and underscored its potential to meet the evolving needs of this expanding audience

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SOURCES

WANG, Y., XIONG, J., ZHANG, Y., & FANG, X. (2018). THE DESIGN OF SATELLITE TELEMETRY DATA STORAGE AND ANALYSIS SOFTWARE BASED ON HBASE DATABASE. 2018 IEEE CSAA GUIDANCE, NAVIGATION AND CONTROL CONFERENCE (CGNCC), XIAMEN, CHINA, 1-4. HTTPS://DOI.ORG/10.1109/GNCC42960.2018.9019115

BONYADI, M. R., MICHALEWICZ, Z., NALLAPERUMA, S., & NEUMANN, F. (2017). AHURA: A HEURISTIC-BASED RACER FOR THE OPEN RACING CAR SIMULATOR. IEEE TRANSACTIONS ON COMPUTATIONAL INTELLIGENCE AND AI IN GAMES, 9(3), 290-304. HTTPS://DOI.ORG/10.1109/TCIAIG.2016.2565661

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Timeline & Key Dates

01

First objective is to find out the direction for the whole branding process. We will take the first steps for this during the discovery session and materialize it during the actual strategy work.

P DURATION:
Sep. 20-30

02

backend was developed with a focus on efficient telemetry data collection and storage. Key issues, like stuttering and data mismatches, were resolved to ensure smooth performance.

DURATION:
Sep. 20 - Dec. 8

03

UI was designed with beginners in mind. A clear interface, helpful guides, and intuitive visualizations were created to make telemetry data easy to understand and use.

DURATION:
Oct. 10 - Dec. 10

04

focused on merging backend and UI. Dynamic features like gear visualization and multi-lap analysis were added, with testing to ensure seamless user experience.

DURATION:
Sep. 15 - Sep 20

User Personas

LEWIS

- **DEMOGRAPHICS:** MID-20S, RECREATIONAL RACER WITH A SELF-MODIFIED CAR. RACING IS A PRIMARY HOBBY.
- **GOALS:** USE SIM RACING FOR SAFE, AFFORDABLE PRACTICE TO REFINE SKILLS WITH CLEAR TELEMETRY INSIGHTS.
- **CHALLENGES:** NEW TO SIM RACING, STRUGGLES TO BRIDGE THE GAP BETWEEN REAL-WORLD EXPERIENCE AND VIRTUAL IMMERSION.
- **NEEDS:** INTUITIVE VISUALIZATIONS AND TIPS TO ENHANCE REALISM AND IMPROVE PERFORMANCE.

CHRIS

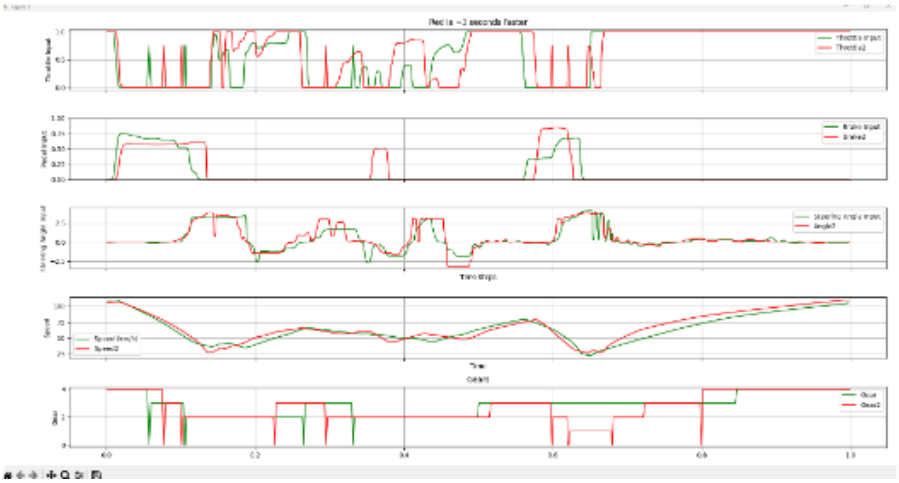
- **DEMOGRAPHICS:** 28-YEAR-OLD SOFTWARE DEVELOPER, CAR AND GAMING ENTHUSIAST.
- **GOALS:** IMPROVE SIM DRIVING SKILLS WITH A SIMPLE TOOL FOR WHEEL SETUP AND DRIVING DATA.
- **CHALLENGES:** LIMITED TIME AND OVERWHELMED BY TECHNICAL JARGON.
- **NEEDS:** BEGINNER-FRIENDLY INTERFACE, PRESETS, AND EASY-TO-FOLLOW GUIDES.

DAVE

- **DEMOGRAPHICS:** ~60-YEAR-OLD RETIRED ENGINEER AND LIFELONG MOTORSPORTS FAN.
- **GOALS:** IMPROVE LAP TIMES IN SOLO PRACTICE SESSIONS WHILE EMULATING REAL-WORLD RACING AS CLOSELY AS POSSIBLE.
- **CHALLENGES:** MAY STRUGGLE TO IDENTIFY KEY IMPROVEMENTS WITHOUT COMPARING HIS DATA TO OTHERS.
- **NEEDS:** BASIC TELEMETRY FOR SOLO USE AND POTENTIAL FOR CLOUD-BASED FEATURES TO COMPARE WITH OTHER DRIVERS.

01 Overview

This project focuses on developing a telemetry tool specifically designed for sim racing enthusiasts. By combining accessible design with powerful data insights, our goal is to enhance the user experience for both beginners and experienced racers. The tool simplifies telemetry data, making it easier for users to identify areas for improvement, analyze their performance, and better understand their racing strategies.



02 Objectives

The objective of this project is to create a user-friendly telemetry tool that makes complex data accessible and actionable. We aim to support sim racers in their pursuit of faster lap times and improved consistency, while offering clear, beginner-focused guides to help them navigate the tool. By focusing on both performance and usability, we are bridging the gap between raw data and meaningful insights.

BRAND IDENTITY

Our tool's identity is rooted in clarity and accessibility, with a sleek, racing-inspired design. From the logo to the interface, every element reflects a focus on empowering racers through data-driven insights.

BRAND STRATEGY

We target beginner racers while offering advanced features for experienced users. Our strategy emphasizes simplicity, community-driven improvements, and clear communication to differentiate the tool from competitors.

BRAND MESSAGING

Our messaging highlights simplicity, support, and growth. This tool isn't just for analyzing data—it's a companion to help racers improve and unlock their full potential.

Proposed Future Work

POLISHING USER INTERFACE

Improve the design and clarity of the interface to ensure a smoother user experience.

BUG FIXES AND OPTIMIZATION:

Address any performance issues and ensure the tool runs efficiently across different setups.

EXPANDED DATA FEATURES

Add more detailed analysis options, such as multi-lap comparisons and simple performance summaries.

INTEGRATION OF VISUAL ENHANCEMENTS:

Begin implementing color schemes and visual elements to align the tool with its branding.

With the core functionality established, the next steps focus on refining and expanding the tool's features. Efforts will include polishing the user interface for better usability and optimizing performance to address bugs. Additional work will involve creating beginner-friendly guides and implementing enhanced visual elements to align with the branding. These steps will ensure a more polished and user-ready product for future testing and feedback.