MAIN PROJECT

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ARMCO RaceTrack Manager

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ABSTRACT

RaceTrack Management is a system which is designed to efficiently manage various aspects of a race track's operations. It includes features such as trackday scheduling and organizing trackdays, registration of riders and track slot reservation. The track slots reservation are done in the basis of previous track timing of their own. Slots are categorized into three: Beginner, Intermediate and Pro-This helps to avoid accidents in track. Vehicle and Riding Gears rental services are also provided. Bike/car companies can register their best performing riders to provide an opportunity to ride with the other riders. This helps to improve rider's performance by helping each other.

MODULES

Admin

Admin can add, edit, delete the schedule of track day. Admin can add/edit the categories/levels of riders as: Beginner, Intermediate, Pro. Admin can set the limit of riders for each level. Admin can control rider's information and their track time. Admin can add /edit rental vehicle Information. Admin provides details for fresher's orientation class.

Staff

The staff can update the track time of each rider. Staff provides the rental services of car/bike and riding gears for riders. Staff has the control to manage the booking of slots based on the rider's personal best track time. If the rider is a new rider ,he will be firstly added to beginner's level. After tracking his personal best time, he will be categorized into respective category. Staff controls the rental services and slot reservation.

Rider

Rider can register to ride by filling the registration form which contains their name, date of birth, driving license, selection of rental/own vehicle, riding gears are also taken from rental. Rider can select the days which they can attend trackdays(Trackdays are maximum 2 days).Rider can select the level of riding (If the rider is new, they can only select beginner slot).If the rider has older track times, then system will automatically selects the level based on their personal best time.

Company Registration

Vehicle companies can register their team consist of their best performing riders to experience trackday with the team of best performing another company or riders. The main intention of this is to provide an opportunity to various company's best riders to

improve their riding experience .Company team should use their own company's vehicle. eg: Yamaha Company team should use Yamaha bikes.

Technologies

- Payment
- Feedback
- Setup an emergency response system with medical facilities, evacuation plans.
- Track Monitoring System : Utilizing sensors and cameras to monitor track conditions and safety hazards in realtime.

Mini Project

- Admin: Add Scheduling, add categories, Set limit of each levels, Details about orientation class.
- Staff: Tracktime updation , Slot assigning.
- Rider: Registration, Schedule selection, Slot selection, Vehicle and riding gear selection(rent/own).

Main Project

The system has features such as trackday scheduling, rider registration, and track slot reservation categorized into Beginner, Intermediate, and Pro levels. To further optimize rider experience, the system employs machine learning algorithms to predict skill levels based on historical lap time data. A comprehensive approach is outlined, encompassing data collection, preprocessing, feature engineering, model selection, training, and evaluation. The proposed model, exemplified by a Decision Tree classifier, offers a promising framework for accurately predicting rider skill levels. The system aims to contribute to safer track environments, facilitating rider improvement through collaborative opportunities and data-driven insights.

Fraud Detection for Fake Registration:

This research introduces a robust fraud detection mechanism within the RaceTrack Management system to identify and prevent fake registrations. Leveraging advanced anomaly detection techniques and machine learning algorithms, the system scrutinizes registration data for irregular patterns indicative of fraudulent activities. By employing features such as user behavior analysis, device fingerprinting, and validation checks, the system enhances security and ensures the integrity of rider registrations. The proposed solution

aims to fortify the race track community against deceptive practices, fostering a trustworthy and secure environment for all participants.

Video Analysis for Crash Detection in Recorded Track Videos:

This research introduces a video analysis framework integrated into the RaceTrack Management system for retrospective crash detection in recorded track videos. Leveraging computer vision algorithms, the system processes pre-recorded video footage to identify and analyze patterns indicative of on-track incidents. Utilizing techniques such as object detection, frame differencing, and motion tracking, the system autonomously identifies potential crashes, providing valuable insights for post-event analysis and safety improvement. The proposed solution aims to enhance the overall safety assessment of race tracks by retrospectively identifying and analyzing incidents, contributing to a comprehensive approach for continual safety enhancement in the motorsports domain.

References

https://www.yamaha-motor-india.com/trackday-campaign.html

Sofware Specifications

- Frontend: HTML/CSS
- Backend: Django