Company background

The **Chad William Young Foundation** was formed in 2017 after the tragic death of Chad Young, a mechanical engineering student at Colorado School of Mines, resulting from injuries sustained in a cycling accident**.**

To improve cycling safety for all riders, a goal of the foundation is to pursue technological developments in injury prevention in all types of cycling. In consultation with others in the cycling community, we are considering the development of a technological safeguard, rather than a physical safeguard such as helmet, to limit the risk of traumatic brain injury resulting from cycling accidents.

There was an initial project sponsored by the Foundation launched as part of the Capstone Design Project at Colorado School of Mines, in January of 2018. This project was completed and delivered in December 2018. *A copy of the final project report and the presentation poster is attached for supporting documentation.* In this report you will find a safety survey completed by 120 cyclists who participated in the Lookout Mountain Hillclimb.

In addition, we sponsored a second project in the summer 2021 Field Session. The summer session automated the existing algorithm used in data collection from Strava and developed an Android application. Please see attached report.

A description of the work remaining to be done

The initial project charter was to consider a technological approach to safety in road cycling of all types; including commuting, recreational, and competitive. After reviewing the Final Report. Here are the recommendations from the 2018 and 2021 teams for additional and subsequent developments. Please see attached reports for full background and progress to date.

- Data Collection Automation
- Real Time Feedback
- Additional Data Incorporation

Data Collection Automation

1) The Foundation has applied for a cost free license and access to Strava Metro. This is a database with access to all Strava data without the personal information. This will allow a broader range for riders, speeds, and skills in an anonymous fashion. Approval of this license request is a dependency for the step in number 2 below
2) Using Strava Metro, enhance the current algorithm using a more comprehensive user dataset eliminating current privacy concerns.
3) Merge the algorithm and all other code into a Mobile App
4) Combine the algorithm and data collection with Apple Mobile App IOS vs Android

Develop an automated process for collecting data from Strava Metro resulting in hazard profiles. Keeping in mind, the end goal of launching a web service where the cycling community would be able to assess and use, providing real time feedback

Real Time Feedback

Create an alert when the rider is approaching or encountering a hazardous condition, whether through audible tone, handlebar display, vibration or mounted light. The current algorithm assigns a hazard profile to every GPS point recorded along a cyclist route.

Additional Data Incorporation

Providing flexibility to incorporate future risk/hazards into the data analysis such as traffic levels.

DOT Outreach - Being able to incorporate DOT data collection of road camber, surface conditions, etc. Is there a state standardize set of data collection that could be incorporated in the app to make the hazard profile more robust?

- ***Any desired skill set for the students***
- **Preferred team size.** 3-5
- **Location where work should be performed:** All work can be performed on campus. Possible meeting cyclists for better understanding of sport and hazards.

Additional Resources:

The Foundation will provide a used older Apple iPhone for data collection or other project purposes as well as any needed funding up to $ 1,000 as needed

Intellectual Property:

The Foundation would require that developments and new IP will be assigned to and owned by the Foundation. A typical CSM release will be used for this purpose.

Attachments:

Chad William Young Foundation cwyf.org