

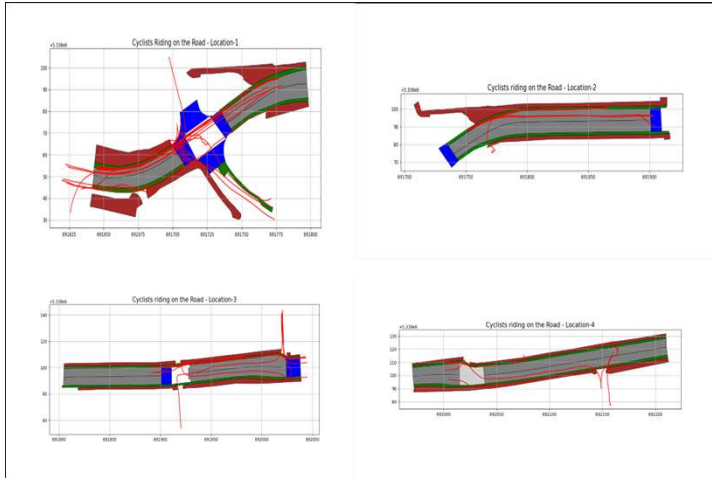
Analysis of the irregular traffic behavior of cyclists using drone videos

Master's Thesis of Ayush Sharma

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Introduction and Objective:

Urban transport is essential for efficient travel, but increasing vehicle numbers cause congestion, accidents, and environmental issues. Promoting active mobility, like walking and cycling, can reduce traffic and improve health.

Cycling is cost-effective and efficient but poses safety risks, with cyclists being highly vulnerable to accidents. Despite improvements in road safety, cyclist fatalities continue to rise.

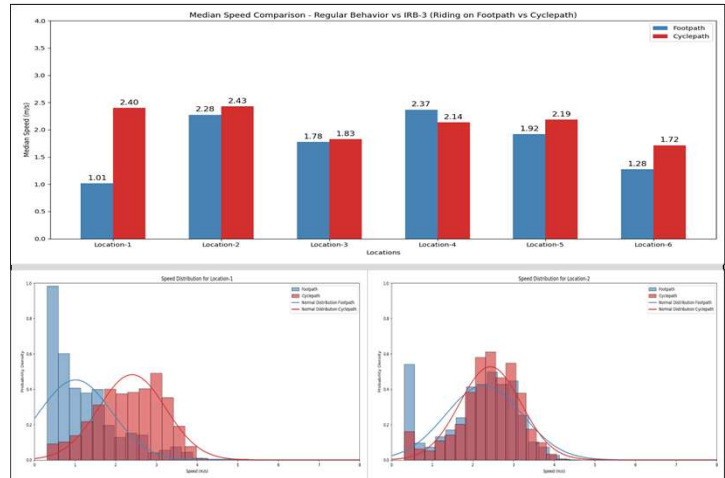
This study aims to identify irregular cyclist behaviors, develop automated detection methods, and compare behaviors to assess risks, contributing to safer urban cycling.

Analysis of Data:

The key objective of this topic was to identify and automate the detection of behaviors of cyclists on road.

The data in this topic was analyzed by watching videos to understand the behaviors that are exhibited by the cyclists riding on the road. These irregular behaviors were observed and categorized. 10 different irregular behaviors were categorized out of which 8 were further analyzed by Automation of detection of these irregular behaviors and their analysis was done by applying different logics and tools.

Also, a comparison was performed between regular and irregular behaviors to distinguish between them.



Results:

This thesis extensively examined several important questions regarding the behaviors of cyclists and the frequency of these behaviors. This was achieved by analyzing the video footage to understand the different types of irregular behaviors and classifying them into different categories. The use of automated methods to detect and analyze these behaviors provides a basis for future improvement in further analyzing these aspects. The use of Python scripts provided a quicker and more reliable way to detect these behaviors and future modifications to these scripts and a better quality of dataset will improve these and would be even more helpful in conducting in-depth research on this topic.

Irregularity class	Irregularity class description
IRB-1	Cyclists Riding in the Opposite Direction of Traffic
IRB-2	Cyclists Riding on the Road Instead of Riding on the Designated Cycle Path
IRB-3	Cyclists Riding on the Footpath
IRB-4	Crossing the Street from the Middle Instead of Using the Zebra Crossing
IRB-5	Incorrect Path at an Intersection (Left Turn and Going Straight)
IRB-6	Cyclists Making a Left Turn from the Middle of the Road
IRB-7	Red-Light Violation
IRB-8	Cyclists Using the Footpath to Overtake Another Cyclist
IRB-9	Riding cycle on the Zebra crossing instead of walking
IRB-10	Making an arc to cross the road instead of riding straight across and then turning left or right.

