# HOW CYCLISTS COMMUNICATE THEIR INTENT?

## Ali Mohammadi

Department of Mechanics and Maritime Sciences, Chalmers University of Technology, Sweden
SHAPE-IT ESR 14

The main objective of this study is to understand vehicle-cyclist interaction and investigating how cyclists communicate their intentions in traffic. This study will propose quantitative models for predicting cyclist intentions at intersections.

## AUTOMATED VEHICLES' (AV) SAFETY IN THE PRESENCE OF VULNERABLE ROAD USERS

- The majority of cyclists fatalities in Europe occur between vehicles and bicyclists, and most of these crashes happen at un-signalized intersections.
- There are some concerns about the safe performance of AV in the presence of vulnerable road users especially cyclists.
- Different active safety systems have been developed to address these types of crashes.



- This study will develop model to help active safety avoiding crashes with cyclists.

Goal:

- In this research, we will assess how cyclists interact with vehicles; what visual cues cyclists use when interacting with other road users, and how they communicate their intent, especially with vehicles at interactions.
- We will produce quantitative models to predict cyclists' intent so that the vehicles could behave based on that prediction.

## DATA 1 – FIELD DATA COLLECITON

- Since many of the interactions between cyclists and vehicles happen at un-signalized intersections, we will focus on this scenario.
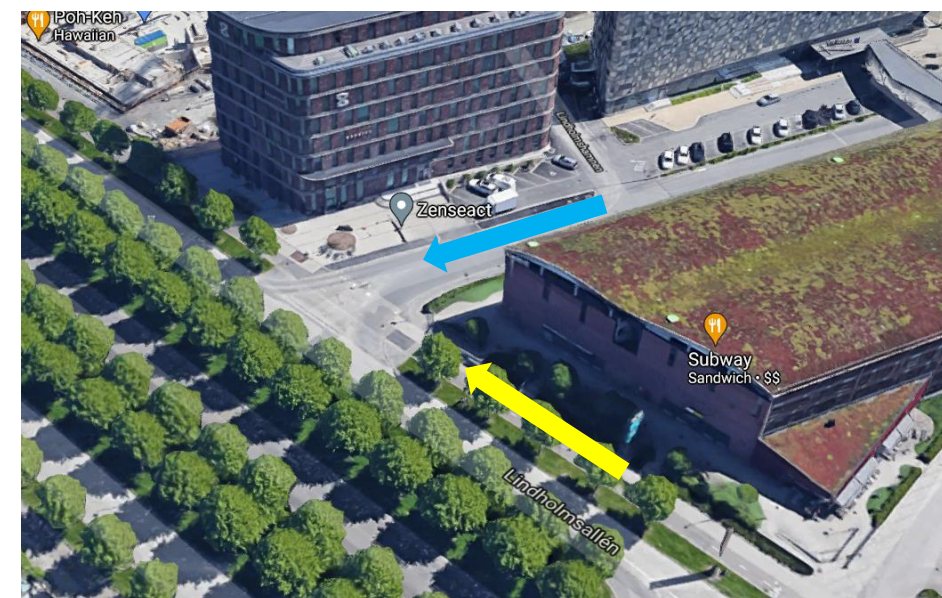


- The figure above shows the layout of our field experiment and the moving direction of involved objects (arrows).

- Once data is collected (trajectories and visual information) we can detect the interaction events and analyze them.

## DATA 2 – SIMULATOR EXPERIMENT

- The second dataset is coming from a cycling simulator at VTI facilities.
- The exact same environment as in the field data collection will be simulated in this experiment to make it possible to compare the results between these two data sources.



- 11 trials are designed to observe the participants behavior under different circumstances.
- The variables that will change during these interaction include visibility condition, time to arrival to the intersection, and vehicle's speed.

## FUTURE WORK

- Extracting interaction events from the field data collection
- Fitting a statistical model, for predicting cyclist behavior at this situations.
- Running the cycling simulator experiment

## SUPERVISON AND CONTACT DETAILS

Supervised by:    Prof. Dr. Marco Dozza
                  Prof. Dr. Gustav Markkula

Contact details:    ali.mohammadi@chalmers.se

## AFFILIATIONS AND ACKNOWLEDGMENT

Designed by ESR9