AI-Based Solutions for Road Safety

UNIVERSITÀ DEGLI STUDI FIRENZE

PhD program in Civil and Environmental Engineering

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Abstract

This study aims to assess the **road safety situation** in real time. We quantify the factors that threaten road safety from three perspectives. We detect, define and predict traffic conflict, which is used as primary measures of road safety. Meanwhile, we model the relationship between conflicts and crashes.

Methods

✦ **Causal analysis**
traffic variables
road users' behaviors
road infrastructure

✦ **Traffic conflicts modeling**
detection(video&simulation)
definition(unsupervised learning)
prediction(explainable AI)

✦ **Traffic crashes modeling**
crash-based method(DNN)
non-crash- based method

How to improve road safety in a low-cost , real-time and intelligent way?

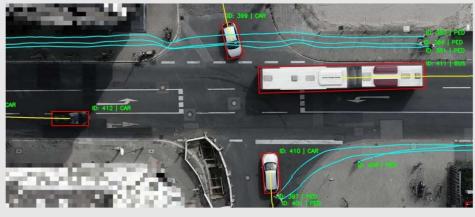**Data-driven methods for road safety modeling**

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Scenarios

Our solutions will be used in **roundabout, highway and intersection**.