

Objective and subjective risk mapping for urban cyclists: an automatic, ubiquitous and continuous approach

Summary

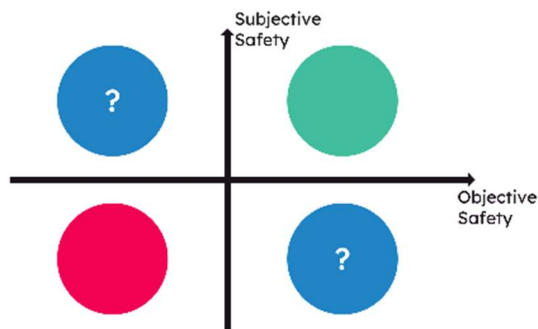
Today, many cities seek to transition to more sustainable transportation systems. Cycling plays a critical role in this transition for shorter trips, which may include first-and-last-mile links to transit. To support this transition, cities need to provide safer cycling networks to increase the number of cyclists as safety concerns greatly discourage both cyclists and non-cyclists from cycling. Hence, cities seeking to promote urban cycling must provide cyclists with a safe environment to cycle. Besides being safe, cyclists must feel the infrastructure is safe, as safety perception dramatically impacts the cyclist's decision to cycle or not.

Here, I propose a new way to study urban cycling safety. I aim to develop a new methodology that can measure both objective and subjective cycling safety. Data will be analyzed and processed using various methods of computer vision, signal processing, and others, to retrieve critical information about the cycling dynamics, environment, and behavior. From this, we will model both objective and subjective cycling risk.

Studying objective safety is critical as it may decrease the number of accidents or its outcomes. Current research revolves around accident site inspection and traffic conditions analysis, infrastructure, and vehicle-related factors. On the other hand, understanding how users perceive safety (i.e., subjective) is key to developing promotion strategies to increase the number of cyclists. Current practice focuses on site and post-riding interviews with cyclists or showing images of the cycling context. As such, current safety analysis methodology is not scalable nor adequate for continuous safety monitoring. Hence, I intend to build a new methodological framework capable of automatically, continuously, and pervasively analyze urban cycling safety. In the end, we seek to build a new methodological framework for transport planners, city officials, and policy-makers to address the following fundamental questions: What factors impact the safety of urban cyclists? How can it be monitored automatically, continuously, and pervasively?

Keywords

Cycling safety, objective safety, subjective safety.



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