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SOUTENANCE DE THÈSE DE DOCTORAT DE SOHAIL ZANGENEHPOUR

DÉPARTEMENT DE GÉNIE CIVIL ET DE MATHÉMATIQUE APPLIQUÉE

UNIVERSITÉ MCGILL

DIRECTEURS : LUIS MIRANDA-MORENO ET NICOLAS SAUNIER

Titre	A VIDEO-BASED METHODOLOGY FOR EXTRACTING MICROSCOPIC DATA AND EVALUATING SAFETY COUNTERMEASURES AT INTERSECTIONS USING SURROGATE SAFETY INDICATORS
Date/Heure	Le vendredi 6 novembre 2015, à 9h30
Salle	497, Macdonald Engineering Building, McGill University

Abstract: Pedestrians and cyclists are amongst the most vulnerable road users as their accidents involving motor vehicles result in high injury and fatality rates. However, data collection for non-motorized road users remains a challenge and automated methods are far more advanced for motorized traffic. To address the shortcomings of the current literature and to improve the microscopic data collection for non-motorized road users, this thesis presents an automated methodology to classify road users using video sensors. Accordingly, road users are classified into three main categories: pedestrians, cyclists, and motor vehicles, with an overall accuracy of over 95%. The trajectories by road user type provide microscopic data for computing exposure and risk measures. As a result, performing surrogate safety studies automatically becomes possible. As part of this thesis, the relationship between the surrogate safety measure used in this research, post encroachment time, and the historical accident data has been investigated. Using several hours of video recorded from a sample of signalized intersections in Montreal, and analyzed using the proposed techniques, the safety effects of two types of bicycle infrastructure, cycle tracks and bicycle boxes, have been investigated. The results show that based on the interactions between cyclists and turning vehicles, having a cycle track on the right side of the road is safer than not having a cycle track or than having a cycle track on the left side of the road. The study on the safety of the bicycle boxes at intersections reveals that this type of bicycle facility is associated with a significant reduction in the number of interactions between cyclists and vehicles.

3 novembre 2015