

FMfI2023 Poster Session

Name

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Poster title

Mathematical Safety Proofs for Automated Driving Vehicles

Abstract

We introduce our methodology to provide strong mathematical safety guarantees to automated driving vehicles. Building on the existing methodology called “Responsibility-Sensitive Safety (RSS)” for mathematical proofs of automated driving safety, our research established its extension called “Goal-Aware RSS (GA-RSS)” that expands RSS’s application domain to a variety of real-world driving scenarios. The techniques in GA-RSS derived from theoretical results in formal logic enable one to provide mathematical safety proofs to more complex driving scenarios than before, especially those which require achievement of certain goals such as an emergency stop.

Short Bio

James Haydon, Ph.D., is a Technical Specialist at the JST ERATO "Metamathematics for Systems Design" Project at National Institute of Informatics (NII), Tokyo, Japan. He received a PhD in Mathematics from the University of Oxford (UK), in 2014, where he was supervised by Prof. Minhyong Kim. Before his current position, he held positions as a software engineer in industry, mainly working on formal systems and domain specific languages. His interests include formal systems, programming language design and category theory. He created the lawvere categorical programming language.