PROCEEDINGS
OF
LONDON INTERNATINAL CONFERENCES

eISSN 2977-1870

Does AI based techniques in self driving cars help improve safety?

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Abstract

This brief investigation cognition self-driving cars are considered the future of transportation where the safety of the vehicles is of great significance as they become more prominent in society. This article goes deep in discussing the approaches to safety assessment of autonomous systems and the focus is made on the concept of black-box safety validation algorithms. These algorithms are based on probabilistic models of system operation. Therefore, they estimate a broad spectrum of possible failure situations for analyzing the system's reliability, as opposed to the white-box approaches which are usually more time-consuming. However, the usage of such black-box approaches has its drawbacks concerning the guarantee of safe operations. To meet these challenges, the article discusses compositional validation techniques which involve testing of the components of the system to help come up with a comprehensive safety validation. In future development, black-box simulations combined with compositional validation may serve as potential approaches for improving the rigorous safety requirements that are vital to the viability of AVs. These ongoing pieces of study and developments in these fields are expected to increase the robustness and credibility of self-driving technologies in transportation.

Keywords: Autonomous Vehicles (AVs), Safety Validation, Black-Box Algorithms, Compositional Validation, Probabilistic Models

https://doi.org/10.31039/plic.2024.11.273

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