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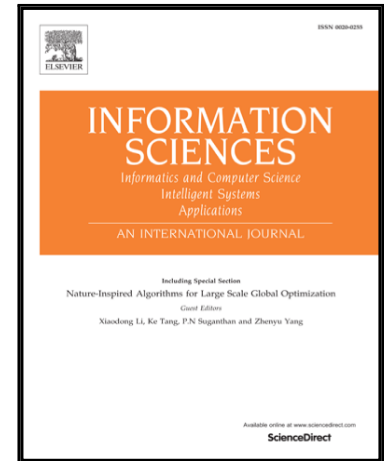
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Dual Mode for Vehicular Platoon Safety: Simulation and Formal Verification[☆]

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Abstract

In order to cope with uncertainties in a platoon, this paper proposes a re-configurable multi-agent architecture to address the platoon safety problem by handling two modes: the normal mode and the degraded mode. At this stage of research, the normal mode is characterized by the interaction between agents over a Vehicle-to-Vehicle (V2V) communication network while the degraded mode simply involves sensors for a local perception. The switching from the normal mode to the degraded one is triggered when the communication quality is considered not fully reliable. A PID (Proportional Integral Derivative) controller is proposed to regulate the inter-vehicle distance and orientation. Two models are proposed in this paper: in the first one, management operations such as splitting and joining are set up while the second is mainly modeled to assess the implemented controller quality. In this paper, the safety of a platoon is represented by the quality of tracking and the inter-vehicle distance. The

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