

On mixed traffic with human-driven and autonomous vehicles

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Abstract:

In recent years, field experiments have been performed on ring roadways with human-driven vehicles or with a mix of human-driven and autonomous vehicles. While these experiments demonstrate the potential for controlling traffic flows by a small number of autonomous vehicles, the theoretical framework about such a possibility is to a large extent incomplete. This presentation will discuss possibilities to enhance existing theories to meet the questions raised by the field experiments. A new interconnected stability definition is proposed. This new interconnected stability notion is able to explain phenomena observed in field experiments, to highlight possibilities and limitations of traffic control via sparse autonomous vehicle, and to design AV controllers with improved string stability specifications.