

Feasibility Study of Distributed Lightless Intersection Control with Level 1 Autonomous Vehicles

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Abstract : Urban intersection control without the use of the traffic light has the potential to vastly improve the efficiency of the urban traffic flow. For most proposals in the literature, such lightless intersection control depends on the mass market commercialization of highly intelligent autonomous vehicles (AV), which limits the prospects of near future implementation. We present an efficient lightless intersection traffic control scheme that only requires Level 1 AV as defined by NHTSA. The technological barriers of such lightless intersection control are thus very low. Our algorithm can also accommodate a mixture of AVs and conventional vehicles. We also carry out large scale numerical analysis to illustrate the feasibility, safety and robustness, comfort level, and control efficiency of our intersection control scheme.

Keywords : intersection control, autonomous vehicles, traffic modelling, intelligent transport system

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