

**A Simulated Parking Assistance System using slot-based driving**

Pulkit Agarwal

**A Dissertation**

Presented to the University of Dublin, Trinity College in partial fulfilment of the requirements for the degree of

**Bachelor of Engineering (Computer Engineering)**

**Supervisor:** Prof. Vinny Cahill

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Declaration

I, the undersigned, declare that this work has not previously been submitted as an exercise for a degree at this, or any other University, and that unless otherwise stated, is my own work.

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at <http://www.tcd.ie/calendar>.

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April 20, 2021

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**ABSTRACT**

Large scale events, that include mass participation of the public such as musical concerts, sporting events, or even shopping centers during holidays and festivals often result in traffic congestion at the venue and even surrounding areas. One of the main reasons for this problem is inefficient parking guidance i.e. vehicle owners not aware of available parking slots, or if aware, unable to optimally reach the parking location due to their or others lack of knowledge about the parking area and the traffic flow.

To address this problem, a simulated parking assistance system with slot-based approach is proposed. The system uses Simulation for Urban Mobility (SUMO), a traffic simulation software, to simulate the flow of traffic in real time, hereby providing proper knowledge and fine-grained advice and directions to vehicle drivers to help smoothen the flow of traffic and alleviating congestion.

The project also explores whether a slot-based approach for this system is more beneficial as compared to the current parking methodologies. This approach is similar to the time division multiple access (TDMA) method in data communication in computer networking. In this scenario, the path from the entry to the parking lot inside the parking is the channel to be divided up and the vehicles are allocated slots on dem and to travel towards their destination.

The potential benefits of the system comprise of proper guidance, accurate journey times and a better flow of traffic. Existing research for slot-based driving for intersections and on-ramp merging scenarios have been completed. However, this project will specifically target the flow of traffic during large scale events within the parking areas.

**SUMMARY**

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# **Introduction**