RITA 2018

Waste to Sustainable Energy

Proceedings of the 6th International
Conference on Robot Intelligence Technology
and Applications

Contents

Longitudinal Velocity Control Design with Error Tolerance Strategy for Autonomous Vehicle

Umar Zakir Abdul Hamid, Balaji Ravichandiran, Murtadha Bazli Tukimat,
Hairi Zamzuri, Fakhrul Razi Ahmad Zakuan, Dilip Kumar Limbu
and Muhammad Aizzat Zakaria

1 Moovita Pte Ltd, 8 Burn Road Trivex Building, 13-01, 369977 Trivex, Singapore
e-mail: umartozakir@gmail.com , razi@moovita.com
2 Vehicle System Engineering iKohza, Malaysia-Japan International Institute of
Technology, Universiti Teknologi Malaysia, 54100 Kuala Lumpur, Malaysia

3 Faculty of Manufacturing Engineering, Universiti Malaysia Pahang,
26000 Pekan, Pahang, Malaysia

Abstract:
This work serves as the proof of concept of an autonomous vehicle prototype developed by Moovita and Universiti Teknologi Malaysia. For a dependable driverless vehicle maneuver, it requires a stable velocity controller to allow for the desired longitudinal motion navigation. Thus, a multi-level longitudinal velocity control is proposed as part of the motion guidance strategy. The higher level formulates the desired braking and torque actuation relative to the obtained reference generator information, while the lower level aids the vehicle to actuate the actuators. The focus will be on the higher-level velocity control design, where (i) it is expected to yield alternate actuation between braking and gas, and (ii) to prevent the sudden increase in actuation and yield a more-human like behavior. An error tolerance strategy is included in the controller design to achieve this. The controller design is then validated on a varied speed real-time experiment as a proof of concept. Results show the proposed controller is able to provide the desirable navigation for controlled AV navigation in a predefined environment.