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Navigation Technologies for Future Autonomous Vehicles

Naser El-Sheimy

University of Calgary

There are three 'pillars' that define the performance or usefulness of a navigation technologies – cost, accuracy, and continuity. Navigation is a field that has been fascinating humankind for thousands of years and these pillars have been evolving with new technological advancements. The current market in positioning and navigation is clearly dominated by GNSS. Besides being globally available, it meets two important pillars: accuracy and cost by providing the whole range of navigation accuracies at very low cost. It is also highly portable, has low power consumption, and is well suited for integration with other sensors, communication links, and databases.

At this point in the development of navigation technology, the need for alternative positioning systems only arises because GNSS does not meet the continuity pillar as it does not work in all environments. Furthermore, there has been a constant market push to develop navigation systems that are accurate, continuous and easy to afford. Needless to say, that cost, and space constraints are currently driving manufacturers of cars, portable devices (e.g. smartphones), and autonomous systems (e.g. self-driving, drones and agriculture machine systems) systems to investigate and develop next generation of low cost and small size navigation systems to meet the fast-growing autonomous vehicles and location services market demands. This presentation will provide a state of the art and future trends of sensors used for navigation of autonomous vehicles: possibilities, limitations and various design approaches. Emphasis will be on sensors and technologies that can navigate autonomous vehicles everywhere and at any time independent of weather and light conditions. Some of the current developed and possible future system's accuracy performance will be demonstrated through different implementations/applications using Propound Positioning Inc technologies.