

1. **Title:** Object tracking, sensor fusion and situational awareness for assisted- and self-driving vehicles: Problems, solutions and directions
2. **Duration:** Half-day
3. **Intended Audience:** The proposed three-hour tutorial will be valuable to students, researchers and practicing engineers at universities, government research labs and companies who are interested in developing tracking and fusion solutions for automotive applications.
4. **Description:** The automotive industry has been undergoing a major revolution in the last few years. Rapid advances have been made in assisted- and self-driving vehicles. As a result, vehicles have become more efficient and more automated. A number of automotive as well as technology companies are in the process of developing smart cars that can drive themselves. While totally self-driving cars are still in their infancy, some features like self-parking, proximity detection and lane identification have already made it into production in high-end vehicles. In spite of these recent developments, significantly more research is needed in order to perfect these nascent technologies and to make them ready for mass production. This provides the motivation for this tutorial.

In this tutorial, we aim to discuss a number of problems related to assisted- and self-driving vehicles, potential solutions and directions for research & development. The issues discussed in this tutorial will span multitarget tracking, multisensor fusion and situational awareness within the context of smart cars. We will also present some of the algorithms that are available in the open literature as well as those we have developed recently. In addition, we will also discuss related computational issues and sensor technologies. Finally, we will present some results on real data.

5. **Prerequisites:** Basic knowledge of tracking and fusion concepts.
6. **About the presenter:** Professor T. Kirubarajan (Kiruba) holds the title of Distinguished Engineering Professor and holds the Canada Research Chair in Information Fusion at McMaster University, Canada. He has published about 350 research articles, 11 book chapters, one standard textbook on target tracking and four edited volumes. In addition to conducting research, he has worked extensively with government departments and companies to process real data and to transition his research to the real world through his company TrackGen. As part of this, he has led the development of a number of software programs, including MultiTrack for real-time large-scale multisensor-multitarget tracking, MultiFuse for distributed tracking, and ISR360 for visualization, performance analysis and situation awareness, which have been integrated into some real systems. Currently, he is working with a major auto manufacturer on developing tracking, fusion and situational awareness algorithms for assisted- and self-driving vehicles.