

Connected and Autonomous Robotic Systems

Project Abstract

by

CMPE 295A

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ABSTRACT

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Nowadays autonomous robotic/automotive system is mainstream in the tech industry. The connected and autonomous systems is an amalgam of embedded systems, IoT, distributed sensor networks, deep learning applications, etc. We aim to develop a foundation which can be used for various applications in medical, robotics, industrial and automotive domain and targets to reduce the time to market by providing a complete package of hardware and software solutions for autonomous systems. This could be deployed directly on systems like cars, wheelchairs, robots, etc. to adapt to various autonomous applications.

Currently, in the field of robotics and autonomous systems platforms such as Nvidia Jetson TX2 and Slamtec Slamware exists. These platforms do not provide complete end to end solution that can be deployed on a robotic or automotive system and thus cannot be used to quickly prototype a product. Thus, engineers need to research and test different hardware modules and their software compatibility which suits their application requirements.

We thereby propose to solve this problem using a generalized connected and autonomous robotic platform. The low-level architecture will support numerous micro-controller based edge devices such as LIDAR's, RADAR's, proximity sensors, GPS, ultra wide band localized beacons, Wi-Fi module, IMU sensors etc. The upper level architecture uses Linux based systems which can support complex frameworks and computing intensive applications such as object detection and classification, localization, path planning and obstacle avoidance. The higher level system plays a key role in coordinating the entire connected and autonomous robotic systems.