I. Abstract

Automotive systems are turning out to be one of the most complex consumer electronic systems being ever built. For the modern day users, they are products like smartphones and tablets but in size, complexity and quality and safety requirements they match if not exceed aircraft, and similar high integrity systems. Many of the major advances in Software engineering like model based development, platform based design and product line engineering have been introduced in the development of automotive electronic and software subsystems, which involve million lines of code and tens of electronic control units interconnected with multiple communication buses.

This talk will highlight the challenges, current practices and new developments in the industry in building next generation automotive software from the modeling and analysis perspective. The challenges include traditional issues like system integration and feature interaction arising out of the federated development model, heterogeneity in subsystem behavior, time and space distributed development of software and the recent and rapidly increasing demand for advanced driver assistance features and system level requirements like fault tolerance and security. The talk attempts to outline a set of requirements for modeling from the perspective of system design and analysis. The talk will also touch upon some of the research and developments efforts currently ongoing within and with our external partners to meet these challenges.

II. Biography

Ramesh S is a senior technical fellow at General Motors Global R&D, USA, and is responsible for providing technical leadership for research and development in several areas related to electronics, control and software processes, methods, and tools. He is an active industrial member of the Network for the Engineering of Complex Software-Intensive Systems for Automotive Systems (NECSIS), sponsored by the Automotive Partnership Canada. Earlier, he was on the faculty of the Department of Computer Science & Engineering at IIT Bombay, for more than fifteen years. At IIT Bombay, he played a major role in setting up a National Centre for Formal Design and Verification of Software. His areas of interest are rigorous software engineering, embedded systems and real-time systems and he has published more than 100 papers in international journals and conferences. He has been on the editorial boards of the International Journal on Real-Time Systems and the Eurasip Journal on Embedded Systems, as well as earlier on the IEEE Embedded Systems Letters.