

**Peter Jones (Warwick)**

## **Automotive Electronic Systems of Systems**

The past 30 years have witnessed a near exponential growth of in-car electronic systems that has been driven by the premium automobile sector. Current electronic systems in premium vehicles are diverse and include: systems that control the engine, transmission, suspension and handling of a vehicle; air bag and other advanced restraint systems; comfort systems; entertainment systems; security systems; and telematic systems. Such wide ranging functionality is enabled by 50, or more, electronic control units (ECU's) that are distributed throughout a vehicle. Individual ECU's host software that is required to interact with sensors, actuators and other ECU's, within time constraints. The ECU's are linked by a data communications network consisting of several data bus technologies. In systems terms, automotive electronic systems can now be classified as a System of Systems (SoS). The design, implementation and management of such complex distributed systems, and their integration into one cohesive and reliable SoS is presenting new challenges for the automotive industry. Moreover, next generation in-car electronic systems, such as steer by wire and brake by wire, and future hybrid/electric and fuel cell vehicle technologies, will set new and even more demanding challenges. The talk will present an overview of applied research at the University of Warwick on automotive electronic systems of systems.