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Sommario/riassunto

Software development for the automotive domain is currently subject to a silent revolution. On the one hand, software has become the enabling technology for almost all safety-critical and comfort functions offered to the customer. A total of 90 % of all innovations in automotive systems are directly or indirectly enabled by software. Today's luxury cars contain up to 80 electronic control units (ECUs) and 5 different, inter-connected network platforms, over which some 700 software-enabled functions are distributed. On the other hand, the complexity induced by this large number of functions, their interactions, and their supporting infrastructure has started to become the limiting factor for automotive software development. Adequate management of this complexity is particularly important; the following list highlights three of the corresponding challenges: First, the dependencies between safety-critical and comfort functions are rapidly increasing; a simple example is the interplay of airbag control and power seat control in the case of an accident. Careful analysis and design of these dependencies are necessary to yield correct software solutions. Second, advances in wired and wireless networking infrastructures enable interconnection between cars and backend service providers (e.g., to call for help in cases of emergency), between cars and devices brought into the car by drivers and passengers (such as cell phones, PDAs, and laptops), and even among cars. This dramatically shifts the focus from the development of individual software solutions residing on dedicated ECUs to their distribution and interaction within and beyond car boundaries.
