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## *Automatic Configuration of Real-Time Operating Systems and Real-Time Communication Systems for Distributed Embedded Applications*

## *Abstract*

The design of distributed software for embedded systems in products like automobiles, automatic manufacturing lines, robots, telecommunication systems, etc. becomes incredibly complex due to the huge amount of parallel working and interconnected microprocessors. Exactly their mutual in/out-dependencies and, therefore, their implemented communications make them very complex.

We developed a methodology to generate the operating systems and the communication system for a distributed embedded real-time application. This is done by a new configuration approach named *Puppet Configuration*. The final systems are highly adapted to the requirements of the application.

Additionally, the behaviour of the finally configured distributed system is analysed in order to ensure a temporal correct behaviour. A new *Time-triggered Event Scheduling* scheme is used to attain this information before the system is targeted and implemented.

This innovative design approach of using configuration and prediction of its behaviour reveals a lot of potential for shortening the design time and, therefore, the time-to-market of a new embedded real-time system for a product with distributed control.