

Research on Fault Tolerance for the Static Segment of FlexRay Protocol

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Abstract—FlexRay is the next generation communication protocol in automotive network. But the development was hindered because most of the researches ignored transient fault in message transmission. In this work, a complete framework is presented to increase the reliability by retransmitting messages in the static segment. It includes system model, mathematical abstraction and a heuristic algorithm. Given a specification of the system model, our work will not only get the system satisfy the reliability goal but also optimize the bandwidth utilization rate. Simulation results show that our approach performs better than the existing algorithm in bandwidth utilization rate (-19.1%), reliability (+0.07%) and running time (-37.2%). In our opinion, this algorithm is so generic that it can be widely used in other time-triggered and reliability critical applications.

Keywords—Bandwidth utilization rate, Fault tolerance, FlexRay, retransmit message, static segment.



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