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Automotive Systems Optimization Based on Safety Requirements

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Abstract
An approach for system design and architecture optimization driven by safety and cost constraints is proposed in this paper. It consists of an architecture synthesis and mapping approach that takes into account the safety constraints in the ISO 26262 context. This approach makes possible to reach a system preliminary architecture by choosing the best component that reduce the overall cost. On the other hand, it leads to a mapping that respects the safety constraints related to safety levels and to dependent failures. Exhaustive and genetic algorithm based approaches are used for the optimization. The use of these two approaches depends on the size of the considered problem. The authors demonstrate that these approaches can be used efficiently to reach an optimal design.

Keywords: Safety, Functional Safety, Architecture Optimization, Automotive, Genetic algorithm

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