

# Multi-objective Optimization of Fault-Tolerant Aircraft Systems Considering System Degradation

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***ABSTRACT*** - This article presents the recent developments of the software tool SYRELAN (System Reliability Analysis) and its methods, which provide an environment for system engineers to model and analyze complex systems of various technical backgrounds with respect to safety and reliability. Each model's core is the hybrid system model, imaging the failure-free system architecture with the use of Reliability Block Diagrams and the system behaviour and interactions of the components with the use of Concurrent Finite State Machines. Based on this hybrid system model, the article on hand presents an optimization environment considering system reliability, residual reliabilities and additional static parameters for different system states. The optimization process is demonstrated using a generic electrical power supply system based on a single-aisle twin-jet commercial aircraft.