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Quality and Safety, always a beginning! (1)

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THE UTILIZATION OF MACHINE LEARNING ALGORITHMS TO ENHANCE AUTOMATIC MODEL-BASED SAFETY ANALYSIS (MBSA) TOOLS

Abstract

System safety analysis techniques are used mainly during the design of safety- critical systems. As these analyses are usually based on an informal system model, they will not be complete, consistent, and error free. Model- Based Safety Analysis (MBSA) is an approach in which the system and safety engineers share a common system model created using a model-based development process. By extending the system model with a fault model as well as relevant portions of the physical system to be controlled, automated support can be provided for much of the safety analysis. Most MBSA tools are based upon various search and condition algorithms. However, the aspect of a learning curve is always missing. This paper introduces the implementation of machine learning algorithms in order to enhance the extracted failure conditions. The developed algorithm will be applied upon the already developed techniques [1][2]. The algorithm is trained with various resolved flight control systems. The performance of the algorithm is investigated after the addition of the machine learning aspect.

[1] A new complete solution to efficiently utilize Model Based Safety Analysis (MBSA) to evaluate Aerospace Systems, IAC-20,D5,1,1,x56133

[2] Elmeadawy, S., Abdellatif, A., and Holzapfel, F., "Utilization of Constraint Satisfaction Problem Algorithms in Model-Based Safety Analysis," AIAA Aviation Forum, 2020.