For the year 2020 the Heinrich-Hertz satellite mission (H2Sat) is planned, in which two radiation-hard FPGAs should be used. To reduce the effects of solar radiation effects, different mechanisms and structures should be analyzed. Especially, redundancy structures that replicate modules n-fold with subsequent majority voting (N-Modular Redundancy) are able to detect errors with a high probability. Therefore, the definition of the voter structure plays a significant role in the design of fault-tolerant systems. However, such redundancy structures increases the resource cost of the system significantly.

In this work, a method for multi-criteria design space exploration of such redundancy structures should be developed. The implementation should be done with the help of an Evolutionary Algorithm (www.opt4j.org). The design goals are to increase the reliability while minimizing the extra resource overhead.

Prerequisites: Knowledge in Java
Type of Work: Theory (40%), Conception (40%), Implementation (20%)
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