Abstract

This paper discusses an object orient approach based on design pattern and computational reflection concept to implement non-functional requirements of complex control system. Firstly we brief about software architecture design, followed by control-monitor safety pattern, Tri-Modular redundancy (TMR) pattern, reflective state pattern and fault tolerance redundancy
patterns that are use for safety and fault management. Reflection state pattern is a refinement of the state design pattern based on reflection architectural pattern. With variation in reflective design pattern we can develop a well structured fault tolerant system. The main goal of this paper is to separate control and safety aspect from the application logic. It details its intent, motivation, participants, consequences and implementation of safety design pattern.

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**Index Terms**

- Computer Science
- Software Engineering

**Key words**

- Reflective Design pattern
- Fault tolerance

- Safety tactics

- Tri-modular redundancy

- Digital distributed control system