

Designing Intelligent Control Systems for Safety Critical Applications

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Abstract

This paper presents a design methodology for behaviour-based intelligent control systems, which we argue is suited to safety critical applications. The methodology has a formal basis, and uses dynamical systems theory to prove system safety properties that are expressed in terms of Lyapunov stability. We propose a new computational model for implementation of these systems, which offers a reduction in complexity due to its non-symbolic structure. Reduced complexity is attractive because it allows improved depth of failure analysis, and potentially increased system reliability.