

Towards the Application of Swarm Intelligence in Safety Critical Systems

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Abstract

Swarm Intelligence provides us with a powerful new paradigm for building fully distributed de-centralised systems in which overall system functionality emerges from the interaction of individual agents with each other and with their environment. Such systems are intrinsically highly parallel and can exhibit high levels of robustness and scalability; qualities desirable in high-integrity distributed systems. Making use of a laboratory based swarm robotic system as a case study, this review paper explores dependability, robustness and reliability modelling in swarm based systems, and argues that there is considerable merit in further investigating their application to distributed safety-critical systems.