



A Survey of Issues in Computational Situational Awareness: The Case of Network-centric Warfare

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Abstract. This paper surveys the fundamental issues that face the development of computational situational awareness. In doing so, we focus on situational awareness in the context of network-centric warfare. Within this context, we consider both a broad survey of relevant computational techniques and a narrowed focus of three recent implementations. Throughout, we consider how the past techniques and these example implementations compare with insights from literature on the situational awareness of complex systems. In particular, we focus on how theoretical models of situational awareness can provide a guide for computational implementations.

Keywords: situational awareness, network-centric warfare, adaptive resonance theory, neuroevolution, data fusion, data mining, machine learning.

1 Introduction

The main contribution of this paper is to survey fundamental issues in the development of computational situational awareness. The situational awareness of a complex system is simultaneously an old and a new idea. Endsley has been the pioneer in situational awareness (SA) [-1] [-2] and oth-

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