INTERACTIVE TACTICAL TRAINING AND
THE REFLECTIVE STUDY OF THE
EMERGENT RESPONSES OF ARTIFICIAL
INTELLIGENCES

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ABSTRACT

This thesis investigates how a digital training environment might be constructed to allow humans to study the emergent tactical methods of game-playing artificial systems in an effort to gain new tactical skill. After a theory-based examination of such typically disparate fields as artificial life, computer animation, and education theory, this thesis suggests that learners might be able to acquire new tactical skills as required by observing suitable artificial intelligences via an interactive environment constructed in accordance with the principles of the non language-based educative methodology of "reflective learning". Using the game-based backdrop of providing tactical training to pace bowlers in the game of cricket, this training concept is also additionally examined in this thesis through the design, construction, and case study evaluation of a working prototype application based on these arguments.

The results of these investigations suggest that through real-time computer animation and self-directed "reflective" training procedures it is indeed possible to create a setting in which humans can study and learn from the emergent tactical methods of game-playing machines. These investigations also indicate that while artificial entities suitable for initial training purposes can be created with some difficulty, the present limitations of AI technology make creating computational virtual entities suitable for expert-level training a complex task. Thus, this research indicates that a form of tactics training based upon the study of game-playing artificial entities is possible, although further advancements, particularly in the area of real-time machine learning, are
necessary before such a mode of training can achieve a level of performance suitable for use with expert human players.