Proceedings of the Annual General Donald R. Keith Memorial Conference
West Point, New York, USA
April 30, 2015
A Regional Conference of the Society for Industrial and Systems Engineering

A Procedural Approach to Route Planning for Dismounted Simulated Agents under Fire

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The views expressed herein are those of the author and do not reflect the position of the United States Military Academy, the Department of the Army, or the Department of Defense.

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Abstract: Modeling dynamic agent behavior on simulated battlefields allows analysts to accurately understand the effects of various technologies and tactics in combat. Department of Defense efforts have successfully explored dynamic mounted agent behavior for tanks and helicopters due to the large volume of physics based equations that dictate the behaviors of mechanical systems. These simulations, however, fail to accurately represent the largest portion of combat operations in the real world—dismounted operations. Over long distances and time frames, these movements can be approximated sufficiently by current models. A capability gap exists when it comes to modeling Soldier movement over short, tactical distances when under fire. This paper proposes and documents the development of a tactical route agent to fill this gap through a series of costing mechanisms dealing with agent metabolic cost, exposure to the enemy, and risk of fratricide to determine realistic routes for agents in combat.

Keywords: Combat Modeling and Simulation, Dismounted Combatants, Route Planning, Pandolf's Metabolic Equation, Line of Sight, Fratricide, EASE-DMF, LTF, COFFEE