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David S. Mazel* (mazeld@gmail.com), 962 Wayne Avenue, Suite 800, Silver Spring, MD 20910,
and **Andy Ilachinski**. *Fractal measures to quantify agent-based combat with EINSTEIn*.

The study of agent-based land combat has gained increased attention with the computer program EINSTEIn (Enhanced ISAAC Neural Simulation Toolkit). EINSTEIn is a new approach to modeling warfare as a complex adaptive system.

Users define two forces composed of individual agents with specific personalities, weapons, and goals. This program is a laboratory for studying the behavior of agents as they interact with other agents based on personality and tendencies, e.g., clustering together.

Recent work shows agents obey a power-law scaling property as they fight in the battlefield. We extend these ideas and look closely at the fractal nature of the battlefield forces. We show how squad level personality traits affect the fractal nature of the location of the forces it optimizes its goal—e.g., to capture the enemy’s flag.

Moreover, we show the change in three different dimension measurements—fractal, information, and correlation—as the agents compete. We illustrate the time varying changes of these measurements relative to the attrition of agents. (Received September 14, 2006)