Examining Leadership Dynamics in Agent Based Modeling
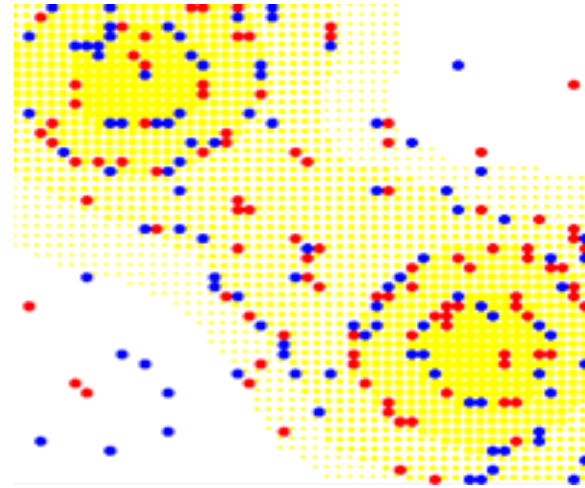## By Alex McGuigan

Abstract

The project attempts to explore leadership dynamics in Sugarscape. The goal is to discover which methods are most frequently used in group formation, which leadership traits form the best groups, and which traits are valuable in followers. This topic was not addressed entirely by Sugarscape, and thus is a good topic for a Syslab project. In addition, Sugarscape spends very little time on combat, and this project intends to fill this gap as well.

Introduction

I expect to obtain results regarding the original layout of stats. I suspect that Wealthy groups will be the largest, and Intelligent groups will be the best able to survive.

Background

This area is dominated by the book *Growing Artificial Societies*, which was written about Sugarscape by the creators of Sugarscape. The Sugarscape model is the state of the art model in agent based modeling currently. I could also adapt features from the many agent based modeling programs created in Swarm or MASON. However, I still need more research that is not directly related to Sugarscape.

Development

I have completely coded the combat, vision, and judgment system for the agents. In addition, I have made some progress on the coding for the group functionality. However, I have encountered a number of bugs in the programs that determine the sugar and opponents on surrounding squares, as well as parts of the movement system. Until these bugs are resolved, I cannot continue coding the group functionality.

Preliminary Results

Due to the bugs in the combat system, I have been unable to test my combat system. Once I eliminate these bugs, then I should be able to test the veracity of my combat algorithm. I want to examine the presence of wealth in my combat model primarily.