

Analysis of Underlying Causes and Mechanics of Civil Disorder

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Abstract

The suppression and alleviation of rebellious elements in a society has been an intractable problem for political leaders for millennia and is a current issue for the United States in the Middle East. Modeling the behavior of dissidents in a conquered state therefore has practical applications. By examining the various historically tested options for restoration of order, one might come to a conclusion as to the most effective means among these choices. When viewed in a manner that is conducive to visualizing geographical as well as demographic patterns, the usefulness of any given model would be extended significantly.

Background

The “Rebellion” model, a previously developed NetLogo-based application, is used to demonstrate the reaction of a population to an occupying government and its actions. The goal of this project is to extend Rebellion to incorporate geographically based elements that would provide a better model to planners.

Procedures

There are four kinds of agents: active agents (red), which are rebelling against the constituted authority; inactive agents (green), which are “normal” people; cops (blue), which serve as the agents of the constituted authority; and jailed agents (black), who have been caught by the cops.

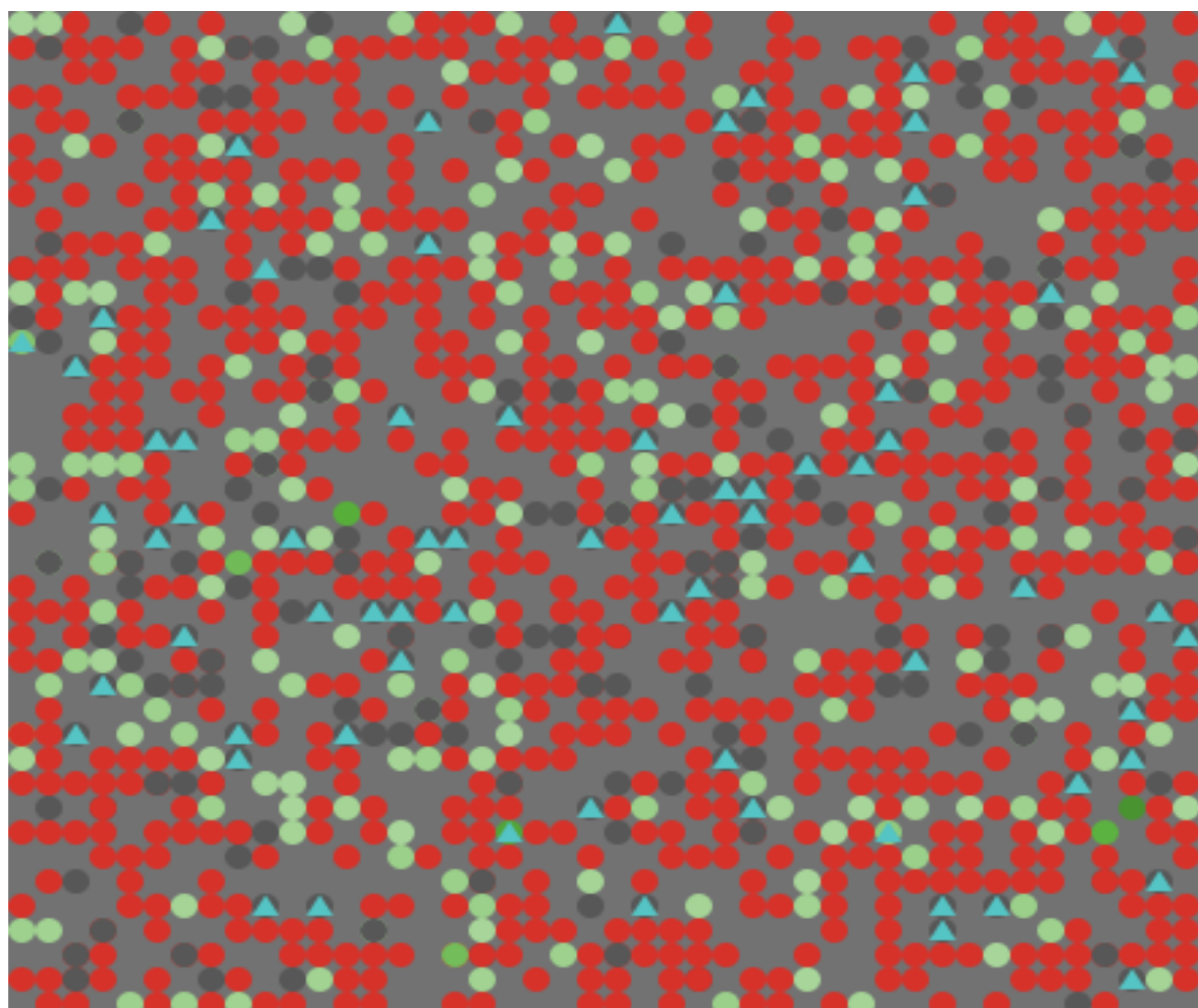


Figure 1. Original model – note the random distribution of the various kinds of agents.

Users have several sliders to adjust which affect the leanings of the various agents (pro- or anti-government): government legitimacy, which is basically whether or not the agents like the government; maximum jail term, which determines how long an agent stays in jail after being caught; cop density, which simulates the forces of the government; and movement, which is a switch that allows or prevents non-cop agents from moving through the environment.

This project’s primary objective was to change how the agents interact with one another. The original model served primarily as a demographic model, and was of little use in charting geographical activity. This project’s improvements, i.e. to make agents’ statistics reliant on the environment (surrounding agents) as well as on the sliders, entailed extensive modification of preexisting Java files for the NetLogo interface as well as additions of new ones.

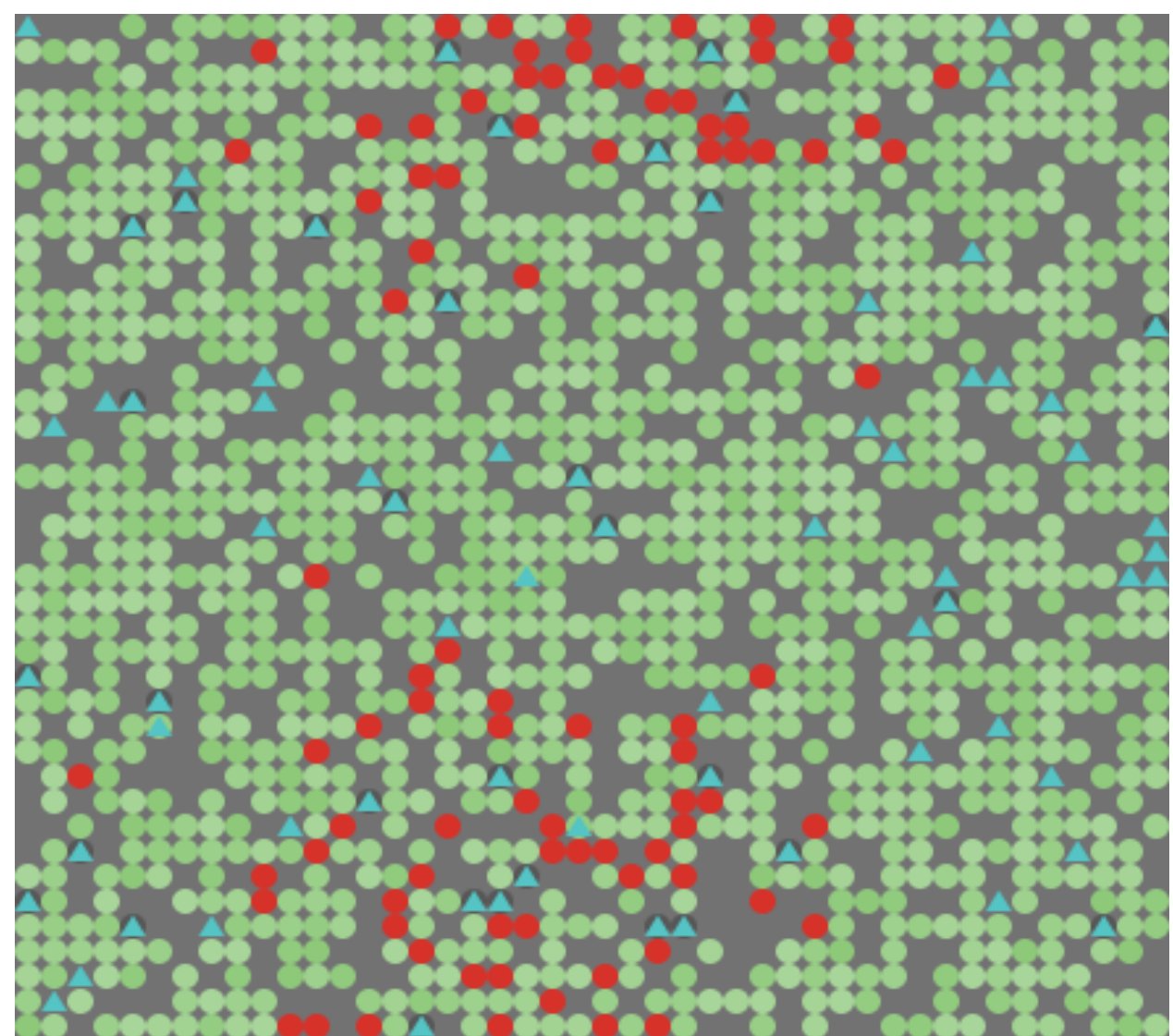


Figure 2. Modified model, in which clearly delineated territories for rebels and government can be made out.

Conclusion and Results

The new, geographically oriented features were successfully implemented, and agents now receive and use input from their environment as well as the global slider input. Findings and overall concept were verified by preexisting theories regarding rebellions in social history, viz. de Tocqueville, Seaman, and Marx.

Possible extensions include adding functionality for ethnic groups and multiple rebelling factions, or to alter the efficiency of government or rebel activity depending on the conditions elsewhere in the environment.