$PRI = C(D + E + P + S) - L$

A Network Science Approach to Protests and Riots

Cadet Theodore Fong

Advisors: Drs. Chris Arney & Kate Coronges; PL470/MA490: Social Network Analysis for Public Policy; Spring 2012

Abstract

Protest movements and riots are not new in history, but the recent protests in Syria, the Arab Spring, and Occupy movements, are unprecedented in their speed and breadth due to advances in technology and communications. Law enforcers are not using technological and analytical tools to keep the protests from evolving into riots. Law enforcers are also stuck in the middle between protesting masses on Wall Street or the Arab Spring on one side and the ruling government on the other side. By researching and understanding the characteristics of protests and riots, we can determine what protocols and techniques used by law enforcement can keep protests from turning into riots; and how to turn riots back into protests with minimal force. We do this through the creation of a model that measures the tension between a protest and a riot in order to identify tipping points between these two states. We support this model through the use of agent-based modeling.

Background

In the past three years, significant events all over the world have taken place where peaceful protests in the USA, London, and the Middle East have evolved into a violent riot. The total cost of a riot ends up going back to the general population. Furthermore, innocent bystanders and business owners could potentially receive permanent damage during a riot. Therefore, it is crucial that we can allow the right to peacefully protest, but prevent them from escalating into violent riots. In order to understand this phenomenon, we model the tipping point between these two states - the point in time where a peaceful protest becomes a riot.

We define the words as follows:

- Protest – a group of people that come together to bring public awareness of an issue
- Riots – a protest that becomes violent
- Protesters and Rioters – Those who participate in protests and riots, respectively
- Government – the ruling organization of authority that is responsible for the protesters and rioters.
- Law Enforcement – Those who's job is to protect the general public from harm.

Methodology

In order to come up with a model for a protest, we must examine the forces within a crowd. There are two major forces that influence a crowd's violence:

The *first force* is the general population's discontent with the government (G). Government discontent is the general negative perception of the government's job performance.

The *second force* is the anti-riot forces which we describe as Law Enforcement Effectiveness (L). Law enforcement effectiveness is how effective the law enforcers, such as police officers, conduct their job.

Knowing this, we can seek to understand the extent to which these two forces interact. The balance between these two forces are the difference between a protest and the potential riot.

We determine three general assumptions:

- Individuals have incentives to protest which have various degrees of aggression. Protesters want to stay proactive as long as possible and therefore will avoid getting arrested. This implies that rioters will only engage in violent actions when they believe their actions will not have personal repercussions.

- All those who participate in a protest are capable of rioting, but have different personal thresholds of deciding when and if to riot. These personal thresholds vary upon people's motive for protesting, those they are protesting with, their personal values, and their economic status.

Results

The model of protests and riots is represented as:

$$C\left[D + E + P + S\right] - L = PRI$$

PRI = Protest Riot Index; indicates how close the protest is to becoming a riot.
C = Communication; indicates how well are the people communicating.
D = Destructive Forces; indicates how much destruction has taken place, like a fire.
E = Environment; indicates the external factors such as time of day, weather, etc.
P = Personal State of Panic; indicates how close one's mental state is to panicking.
S = Government Satisfaction; indicates approval ratings of government actions.
L = Law Enforcement Effectiveness; indicates how well law enforcers do their job.

We use agent-based modeling to simulate our model and verify our assumptions.

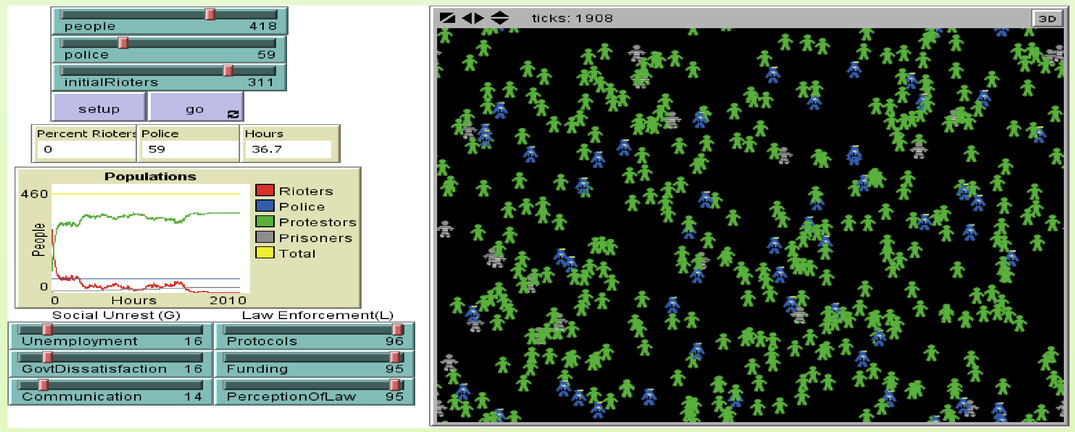

Figure 1

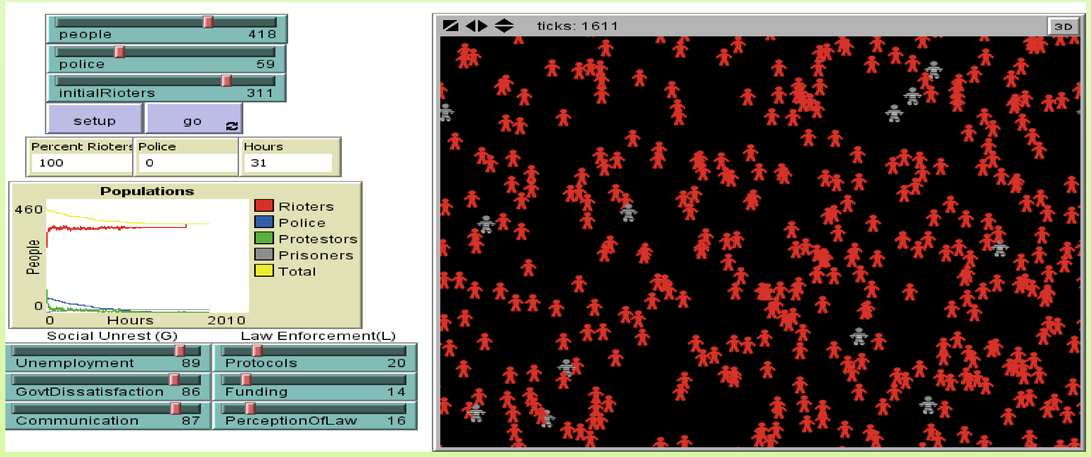

Figure 2

Conclusion

We model the relationship between a protest and a riot through the forces within a crowd. We break down the force of discontent in order to better understand it's contributing factors. From there, we created a standard index, PRI, to measure the tipping point and the state of the protest within a crowd. Using agent-based modeling we simulate a protest/riot interaction.

It resulted with three simple rules: (1) high government discontent and low law enforcement effectiveness guarantees a riot, (2) low government discontent and high law enforcement effectiveness results in peace, and (3) when government discontent and law enforcement effectiveness are equal then there is high tension and the situation can tip either way.

In order to better understand riots and help prevent them, we are modeling the tipping point between protests and riots. We seek to understand the key factors that law enforcement should be aware of during a protest, as well as inform the general public about how they can help prevent a protest from becoming a riot.