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What is a Mob?

A **mob** is an event where a group of individuals get together online or offline (or both) to conduct an act, which can range from dancing on public streets to collectively hacking an electric grid.



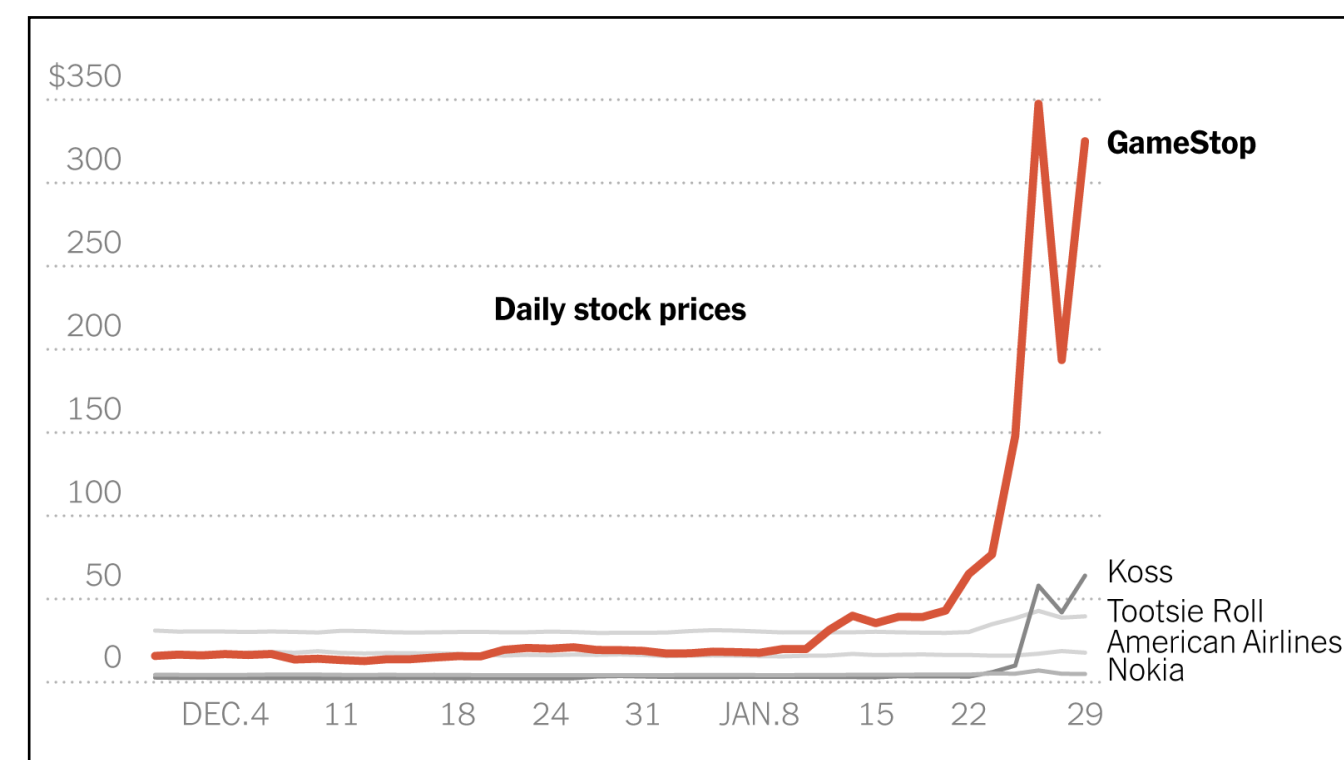
Burger King in Paris (11/5/22)



7-Eleven in California (8/15/22)

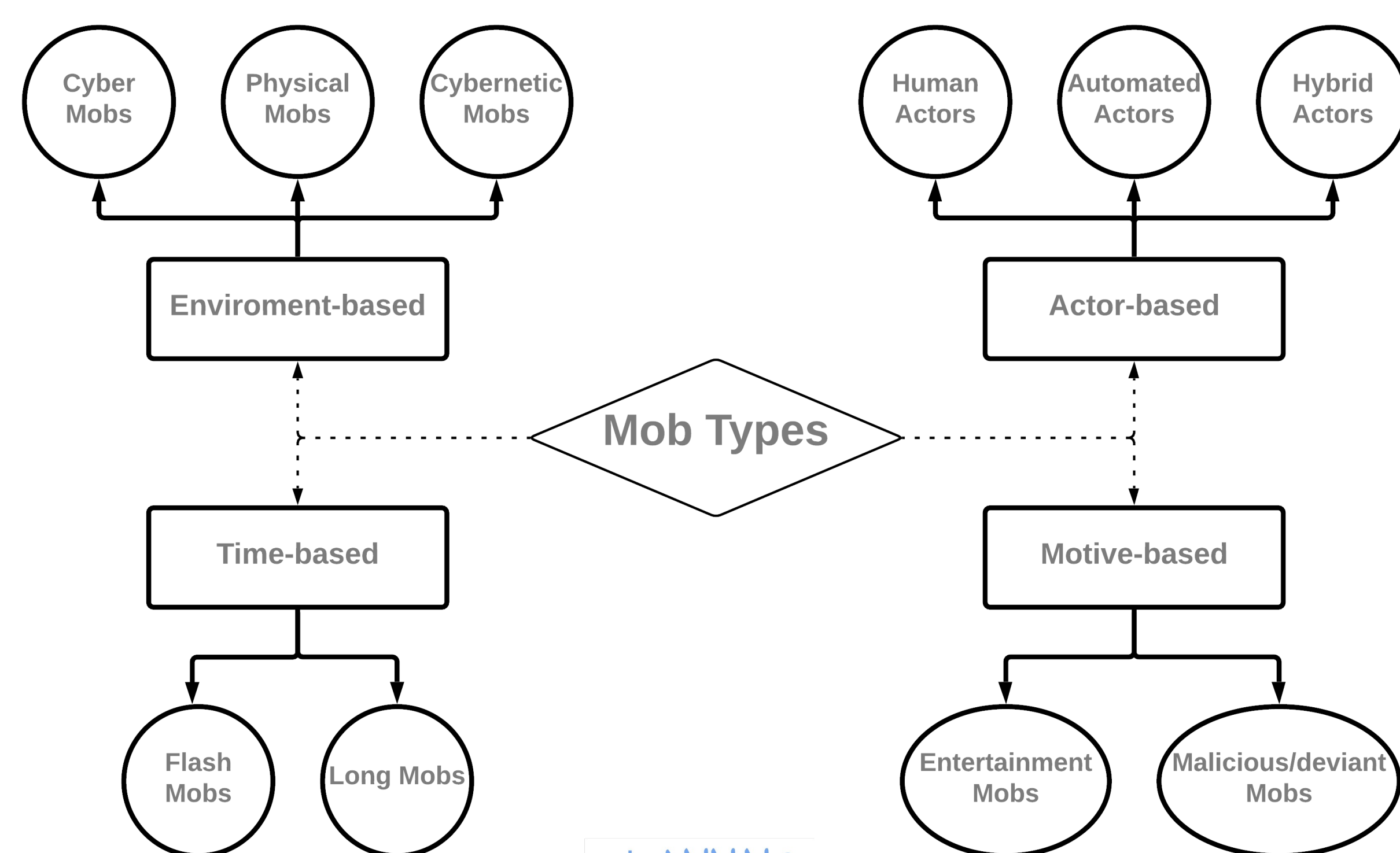


Josh Fight in Nebraska (4/23/21)



GameStop Meme Stock (01/29/21)

Mob Types



Theoretical Model

To determine if an agent will act in mob, we built a theoretical model based on the logic of *collection action theory*. Collective action is defined as an activity of common or shared interest among two or more individuals. According to the theoretical model, an agent could face one of these 4 possible scenarios:

- ❖ If an agent **has interest** and **control**, the agent will act.
- ❖ If an agent **has interest** and **does not have control**, the agent will act or withdraw (a 50/50 chance).
- ❖ If an agent **does not have interest** and **has control**, the agent will withdraw or power exchange.
- ❖ If an agent has **no interest** and **no control**, the agent will either withdraw or act against the mob.

How Did We Study Mobs?

We built an Agent-based model of the mob phenomenon using NetLogo tool to simulate the four scenarios an agent might encounter when it comes to acting or not acting in the mob. We believe that ABM would be a successful strategy for studying mobs as it is a bottom-up approach for studying emerging patterns from simple interactions among agents.

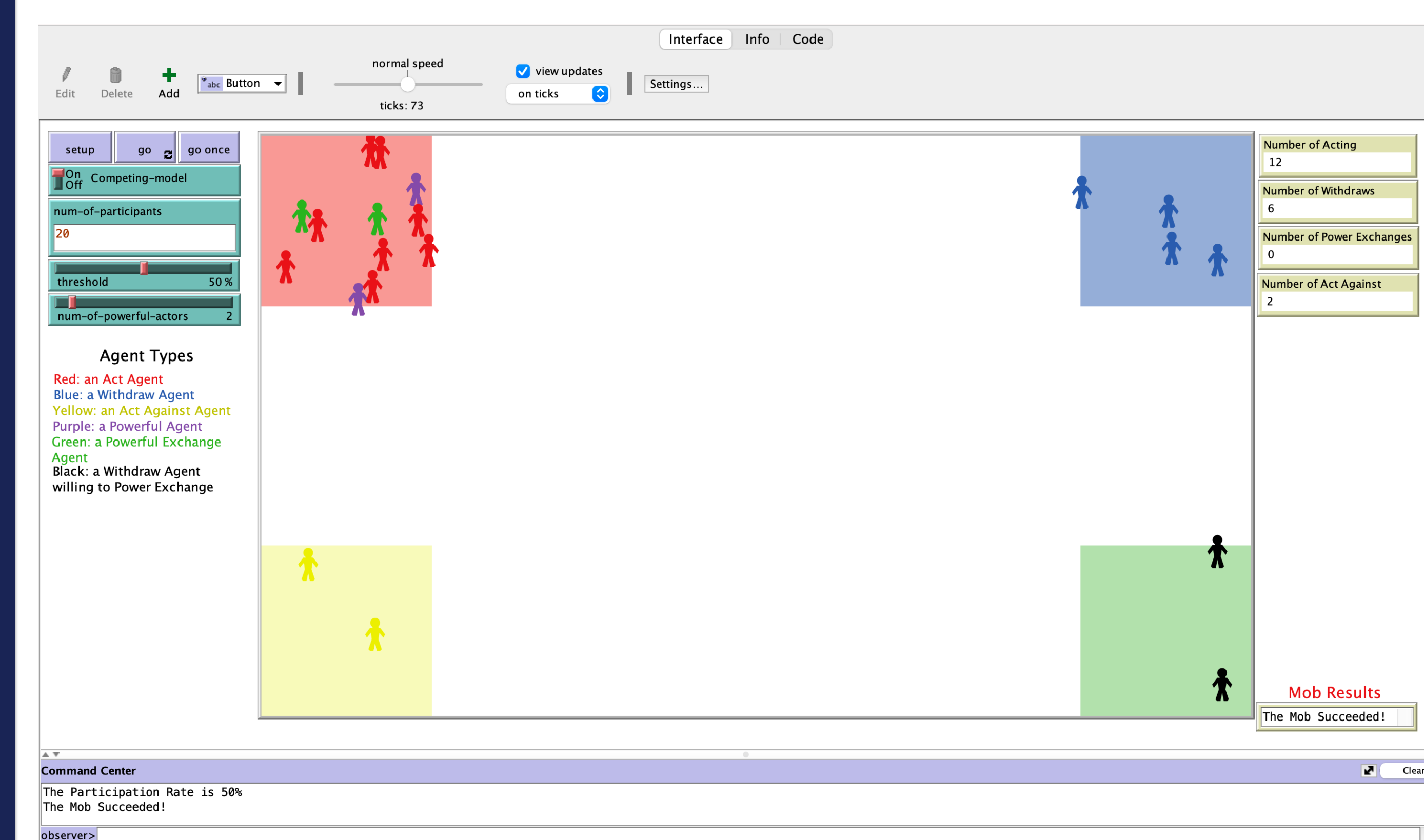
The Agent-based Model

In this mathematical and conceptual model agents can: act, do power exchange, withdraw, or act against the mob based on their interest in the event and control on the event outcome. The model input parameters are:

- ❖ The number of invited people
- ❖ The number of powerful participants (e.g., Mob organizers)
- ❖ The threshold to determine the mob success (which can be estimated from historical data)
- ❖ The participation rate which can be calculated based on one of the equations below:

$$1) \text{ ParticipationRate} = \frac{(\text{NumActing} + \text{NumPowerfulActors} - \text{NumActAgainst})}{\text{NumofParticipants}}$$

$$2) \text{ ParticipationRate} = \frac{\text{NumActing} + \text{NumPowerfulActors}}{\text{NumofParticipants}}$$



NetLogo Model After Simulation

Research Questions

- ❖ How can we use NetLogo to build an agent-based model of the mob phenomenon based on the theory of collective action?
- ❖ Does the number of invited people to a mob affect the number of mobbers participating, hence affecting the success or failure of a mob?
- ❖ How do the mob organizers affect the mob outcome?

Results

After collecting data from about 260 simulated mobs with varying number of powerful actors and participants our results showed:

- ❖ As the number of people invited increases the participation rate is constant (i.e., the group size does not affect the participation rate).
- ❖ As the number of people invited increases the relative difference in participation rate decreases due to the *law of large numbers*: the more the samples the more consistent is the result.
- ❖ The participation rate increases linearly with the increase in powerful actors (i.e., the more people in mob the more organizers we need to make a mob succeed).
- ❖ The participation rate is higher when we do not have agents acting against the mob. This is quite intuitive because the risk of participation will be lower when we do not have agents acting against the mob, hence more mobbers will be encouraged to participate.

Future Work

- ❖ Collect mob data to serve as the ground truth for model validation. The data can be collected from social media sites such as Meetup, Twitter, Facebook, or other online sources.
- ❖ Add more factors from other social science theories to the model. For example, the time of a mob, the location of a mob, and the social ties among mobbers can all be added. This will allow us to discover the critical factors that have a larger impact on the mob outcome.
- ❖ Create a web-based tool of this model to help the less technically savvy users to use it.
- ❖ Create a mob identification framework, for example, given a dataset (e.g., a social network or a set of tweets) can we identify the occurrence of a mob? the mob type, e.g., benign vs. deviant?

