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Progress Report

This week I’ve made a lot of progress on my model. In the previous version of the model, I simply had the turtles turn randomly between 60 degrees left and right. In this version, I’ve changed it so that the paranoia-level of the turtles affects their movement behavior. During each tick, the turtles compare a randomly generated number with their paranoia-level. If the random number is less than their paranoia-level, then they will avoid that person by facing the opposite direction of that agent. Otherwise, the person will turn randomly between 60 degrees left and right as before.

I’ve also created an option to create links and groups in this model. Each group is equal size and the number of groups is determined by the user. The number of links is also adjustable. The group assignment and the links allow for more network-like behavior as well, to emulate family or friend groups, those whose communication isn’t affected by distance but are in contact via phone and Internet. Right now, the groups and links don’t play any role in the model but I’ve laid the groundwork for their use later. In regards to these groups though, I am not sure about what I should do about the size of the groups. Should there be an x number of randomly sized groups or an x number of equal size groups? Right now I have equal sized groups because it is easier to deal boundary conditions but I feel like randomly sized groups are more likely. These are possible changes I’ll make to next week.

The color of the agents now reflects the paranoia-level of that person. When the turtle’s paranoia level is closer to 50, their color is closer to white. The most paranoid the turtle is, the more red they are and the less paranoid, the more blue they are.

The way paranoia spreads has also been changed. Originally, paranoia was spread simply by taking the average of the agent’s own paranoia-level and any other turtle’s paranoia-level on the same spot. I’ve made changes so that the greater the difference between paranoia-levels of two turtles, the greater effect they have on each other. When a turtle encounters another turtle, it subtracts its own paranoia-level from the other turtle’s and then takes 5% of that difference and adds it to their own paranoia-level. This way, the changes are more moderate and are affected by the magnitude of difference between the two paranoia-levels. The paranoia-level is adjusted accordingly based on whether the other turtle’s paranoia-level is higher or lower.

Right now, my two measures of output are the total sum paranoia-level and the average level of paranoia. My model right now shows how paranoia may reach an equilibrium over time but does not address the question of my problem, which is event-based. Those are my biggest next steps for this upcoming week, creating event-based terror events that are both group/network-based and location-based. I will most likely implement this by having a button that allows clicking on the model and any turtles within a certain radius of the clicked area will have a heightened level of paranoia. I will also have an additional button for group-based events.