Eric Hao

EECS 372 – Uri Wilensky

May 14, 2018

Progress Report

My proposal has not been fully approved yet. A slightly more detailed proposal has been reuploaded to *Final Project Proposal* addressing some of the feedback, and this progress report will detail a more developed project idea and model design.

**Main Idea**:

I hypothesize that the arrangement of restroom facilities in a given space affects how people can crowd each other in the restrooms if NUM-PEOPLE greatly exceeds NUM-STALLS. In addition, how people line up for stalls (one line for all stalls, or many lines, one per stall) can affect how long people must wait.

**Agent Behavior**:

Turtles represent people, and patches represent elements of a restroom.

*Setup:*

* Setup restroom based on selected type.
* Spawn group of people away from the restroom.

*At each tick, turtles:*

* Try to use a stall, sink, and dryer in that order by moving toward each facility.
* Move across patches to a vacant facility if it is available.
* If no facility is available, line up for it.
* Wait if PATCH-CAPACITY turtles exist on the patch it is trying to pass through.
* Move slowly across patches to vacant facility if other turtles are also on the same patch.

*At each tick, patches:*

* Update number of turtles on them
* Maybe update count of number of turtles that pass through?
* Change color or appearance to represent vacant or occupied.

**Rationale for agent rules**:

* Feels natural to have turtles be people and patches make up parts of the restroom.
* Patches may be able to store some information to potentially save on computation to make the model faster, like updating the number of turtles on them per tick.
* Even basic turtle behavior for this model is a bit complicated, so I am trying to keep it as simple as possible to start.

**Questions**:

* Is it okay to incorporate both restroom facility arrangement *and* queueing strategy for stalls? Or should I really be focusing on just one.
* If no facility is available, should turtles wait in place or do something that resembles “getting out of the way”, like moving to the side? But I am concerned this probably complicates the model.

**Next steps** (other ideas):

* There are many variables and additions that have crossed my mind, but my goal right now is to get a strong foundation for the most basic version of this model.
* How do people line up for things?
* Towel dispenser versus dryers? Maybe this introduces trash cans?
* Right now, I am assuming the shape of the restroom should be consistent, perhaps a rectangle of fixed size. What about varying the geometric shape of the restroom without changing the area?
* How does the introduction of urinals affect things?
* Can interesting comparisons be made between male and female restrooms? What about unisex ones?

**Bathroom sketches**:

The following image on the next page shows some brainstormed ideas form Thursday. Clearly not all the bathrooms are the same size, but it demonstrates some of the different designs that could be tested and result in different crowding effects.

