

Computer Systems Project Proposal

Model of a Virus Outbreak on a Contained Population

CJ Cahill

1. Today we are faced with the possibility of a new virus outbreak being quite deadly in our densely packed society. The purpose of this model is to show how a virus would spread amongst a close-quartered population.
2. The subject of this project is viruses, and how they spread. This project is worthwhile because it could help people prepare for future outbreaks. Mainly scientists will be interested, but possibly the average person will take interest if an outbreak ever does occur.
3. Some data from previous outbreaks will be looked at in order to check the validity of my program. For the final project, I would want it to be boundless (population-wise), and be able to accurately model most common viruses.
4. There have been other projects similar to mine, and some of them go more in-depth than mine will simply because I don't have the computing power nor the programming expertise to rival their program. There was one project that modeled smallpox getting released into a subway station, and how it would spread throughout the city from a certain station. This also seemed a bit complicated for me because it also included a geographical aspect into the model, which my program ignores.
5. My project will consist of two main parts. The first is to figure out the variable values for a given virus. This will be somewhat subjective, since there are no concrete numbers for infection rate, but there are usually accurate numbers for death & recovery rate. I will have to experiment with the infection rate a bit before getting it more exact. The second part of the project is just running the simulation and reporting the results. The first couple runs of the project will be previous recorded outbreaks so that I know what types of numbers I'm supposed to get from the program. After that the system will be "calibrated" and so I can move into unknown territory with more obscure viruses and viruses that haven't had a major outbreak yet (the Avian Flu for example).
6. The Results from my project will show people what could happen if a given virus were to appear in a given population. I have a simple script in Matlab that does a nice job of plotting all the relevant data so that one can easily see what happened in the simulation. These results can help people trying to protect us from an epidemic because the simulation can show them how a virus would spread so that they can react accordingly, and even take some precautions beforehand.