

Writing Assignment 3 - Math 381 A - Dr. Matthew Conroy

Read the paper by Stanley Milgram and Jeffrey Travers, *An Experimental Study of the Small World Problem*.

<http://snap.stanford.edu/class/cs224w-readings/travers69smallworld.pdf>

Then write about the paper, using the following prompts.

1. Consider the network of "friends" on Facebook: vertices are Facebook accounts and there is an edge between two accounts if the accounts are "friends" (the Facebook term). One can ask the same sorts of questions about this network as are asked in the Milgram paper. Discuss some ways in which you would expect the Facebook network to differ (qualitatively or quantitatively) from the network (of "acquaintances") in the paper. (Note that there would be no need to perform an experiment on the Facebook network the way Milgram and Travers did. Similar information about the Facebook network can be acquired directly through software, as long as one has access to the necessary data.)

In the Milgram paper, the network consists of all people (or perhaps, everyone in the U.S., if we want to restrict the network that way), with edges defined by acquaintance-ship: two people have an edge between them if and only if they are "acquaintances". The experiment is an attempt to quantitatively measure some aspect of this network. In particular, the experiment described in the paper gave an estimate (however poor) of the mean number of intermediary acquaintances between any two (randomly selected) people. The network exists, and we can posit that this mean value exists, regardless of the methods used to measure the network, or even if we make no attempt to measure the mean value. The distance between people is not the distance of a particular (or even possible!) chain of letters (though this gives an upper bound), but the actual distance on the graph.

(If you are unfamiliar with Facebook, or disinclined to think about it, feel free to use a different, specific online social network.)

2. What effect do you think the occupation of the "target" in the study had on the length of the chains? Can you give examples of different occupations that might have resulted in shorter or longer chains?