Assignment 4

MATH 381 A - Winter 2022

Yixuan Liu

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The "small world" theory was quite popular in my high school several years ago. After our philosophy teacher talked about that almost every person could be connected within six acquaintances, students were excited to explore their relations with famous people, such as young celebrities who were popular at that time among the students or successful entrepreneurs that seems hard to reach for us as students. At that time, this theory was hard for us to believe. It was hard for me to find a path to connect me and a celebrity, especially if we had different nationalities. But as we went into college, some real-life cases add more reliability. One of my friends I met in college went to the same high school with a famous young actor, so there must exist some students that can connect them, or even just one single student. Another friend I met in college has a family member who had a business relationship with someone, and that person somehow got in touch with Jackie Chan and invited them to a show. After knowing these facts, I started to think that how I connect to someone who seemed far away from me. For instance, if I want to find the connection between me and a famous actor in Korea, Jackie Chan might be the key person in the chain. Jackie Chan once went to a well-known reality show hosted by one of the most famous hosts in Korea. The "target" actor attended the same show before, so the host could be the acquaintance between them even they never any common in nationality nor area of filming.

At that time I notice that I cannot simply "find" the target person in the acquaintance graph or "build" a connection between that person and me, but based on the acquaintances that are already existed. After reading Milgram and Travers's paper, my idea was more confirmed. People cannot "see beyond their own acquaintances," that is, we cannot just imagine a connection between people. Our cognitions of acquaintances are built on the existing acquaintance graph. Besides that, geographical position and connection in the occupation have a large influence on how short the chain could be. We can find from the experiment in Milgram and Travers' paper, participants in Boston or were stockholders tend to complete the task and in the shorter chain length. It seems that people who share a common geographical position may have more acquaintances in different occupations and people tend to find the target through people who either have shorter geographical distance or are in the same industry. However, I was surprised about the claim in the paper that "women are more likely to cross-sex lines than men." It seems that there should be more underlying logic of Psychology behind this topic. The paper also mentioned that the target

and most participants were in the same class, so it could be another important influence factor in the experiment. In this experiment, the mail was the channel for participants to find possible acquaintances. If the experiment was done before that time, where mail and transportation might be underdeveloped, this experiment might be hard to proceed with. Firstly people would barely know each other if they were far away in geographical position, and hard to get in touch with each other even they are acquaintances. If the experiment could be repeated nowadays, it could be much easier due to the population shift all around the world and communication through the internet. The acquaintance graph could be more complicated but much more convenient to measure by various techniques, such as Facebook or LinkedIn, and people could be more confident to find acquaintances through the internet to reduce incomplete chains. However, also due to the techniques nowadays, the complete rate might drop since the overwhelming information a person could get every day might lead that person to drop the experiment.

Unlike Milgram and Travers's research, which was based on experiments and calculations on models, Karinthy used their own example to demonstrate their understanding of the small world theory in a more philosophical way. Karinthy used the same path as I used in high school to find a target person by "guessing" the possible acquaintances. Just as Karinthy's story says, as the world developed, all the people in the world and all the random things would be connected through time, but Karinthy thinks they are the source of everything, instead of they are a part of the acquaintance graph or the "small world". Here I will share some examples of acquaintances of my friends and family members:

	Family member 1	Family member 2	Family member 3	Family member 4	Family member 5	Friend 1 (Also FM2's friend)	Friend 2	Friend 3	Friend 4	Friend 5
Their age	26	52	43	17	22	48	22	22	22	21
Their location	China	China	China	China	China	China	Canada	China	US	China
Their occupation	UX designer		insurance consultant	student	student	accounting	student	student	bank trainee	student
Acquaintance's age	51	50	58	19	30	68	25	33	35	21
Acquaintance's location	China	Thailand	China	China	China	UK	Russia	China	US	Australia
Acquaintance's occupation	college professor	doctor	CEO	influencer	actor	gardener		athlete	investment advisor	student

Most of my friends and family members are either Chinese or students, but their acquaintances can be much different than mine. One of my family members in China has a friend who used to work in the UK, and at that friend's workplace, she got to know a gardener who was 68 years old; Her college classmate has a brother in law who is Thai; One of my friends in high school has a classmate who is now studying Australia; One of my high school classmates is now studying in Canada and he gets to know Russian when playing a video game; One of my friends is now doing an internship in a bank in New York, so he has a lot of acquaintances in the financial industry. I will use a graph to demonstrate the part of the acquaintance graph at the geographical level.
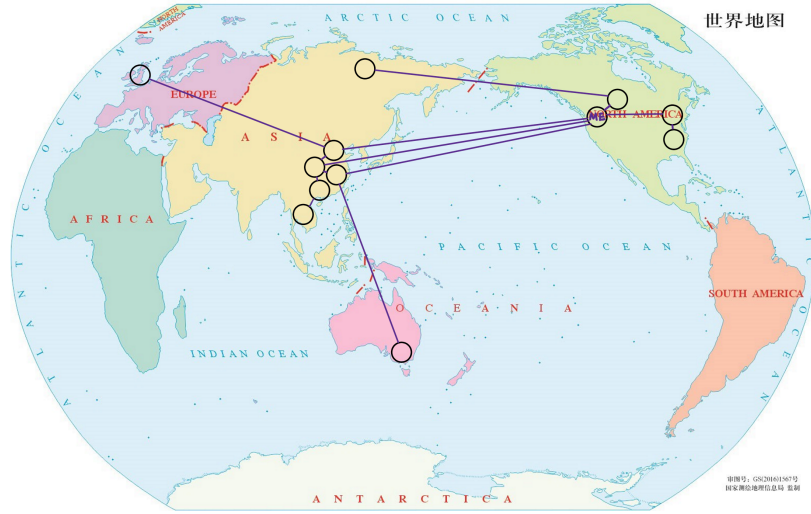
Figure 1: A part of acquaintance graph related to me[1]

We can see from that graph that I am the "center" of the acquaintance graph since the average distance to me for every other 11 people is 1.636, which is the smallest compared to the average distance to other people. However, I only listed a little number of my acquaintances and my acquaintances only told me about one or two more acquaintances from themselves, so as the acquaintance graph gets more complicated and more complete, the center could also be changed. Even though most of my friends and family members are Chinese, people from different countries can be related to me in a very short acquaintance chain. People of different ages, continents, and occupations were connected to each other and are all a part of the acquaintance graph, instead of an isolated small graph or a source. In figure 1 we can see that a person in the southern hemisphere can be connected to a person in the UK or in Russia within a distance of 4; a person from the Eastern Hemisphere can be connected to a person from the Western Hemisphere within a distance of 5. We can conclude that the world is "small" that can connect everyone with a closer distance.

References

[1] ONEGREEN. (2017, November 12). World Map. map. Retrieved February 3, 2022, from http://m.onegreen.net/maps/HTML/55533.html.