Network Analysis on High-Speed Rail System in China

Network Analysis Project Proposal

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**1. Problem Addressed**

The high-speed rail construction as well as urbanization in China have been developing with an incredible speed. In this project, we are about to perform a network analysis on Chinese high-speed rail system. Specifically, we plan to find out the traffic convenience by calculating the centralities of the cities involved and then perform a regression over the total population of each city. Eventually, we try to figure out which cities in China meet the travel demand or need further transportation construction.

**2. Data Needed**

Data needed for this project includes the names and geographic information of cities/stations in the rail system, route information of every line as well as the distance between stations (and maybe the train speed in each line too). These data could easily be found on Wikipedia page and since the number of cities/stations are not in a huge amount, such data could be input manually.

**3. General Approach**

1. Collect and clean the data

2. Input the information in terms of nodes and edges (stations and routes)

3. Construct the network and calculate the centrality of each station

4. Perform a regression based on centralities and total population

5. Evaluate whether the travel demands are meet

**4. Preliminary Division of Work**

I will be the leader of the team and generalize the main idea and optimize the necessary steps. Yunong is going to take part in data collecting and cleaning. Jiaxu and Tengfei will be responsible for inputting data. Everyone will participate in the further stages of this project including constructing the network and calculating the centralities. In addition, I’m going to prettify the graphs produced during the network analysis via D3.js.