1. 왜 AS-Model, M-Model을 선택했는가?

AS-Model has the various state like social opinions. And AS-Model includes persuasion and compromise process. So, it is appropriate for opinion layer.

M-Model has only binary state, such as yes or no, 1 or 0. So, it is appropriate for decision-making layer.

Because each layer has different feature, the competition model can consist of a two-layer network.

1. Sequential updating rule과 Simultaneous updating rule을 왜 그렇게 해석했는가?

These updating rules are related to time.

Considering order of node, sequential updating rule can be analyzed to have enough time for opinion evolution. In the real world, communication method with enough time is like conversation, discussion and so on.

However, simultaneous updating rule can be analyzed to have no time for opinion evolution. Only considering the current situation, the nodes change their states. In the real world, it is similar with vote and election.

Considering order of edge, if the order of edges is simultaneous updating rule, the nodes change their state whenever edges are activated. So, the nodes change their state easily. It is similar with the node characteristics, rash.

If the order of edges is sequential updating rule, the node change their state considering all connected nodes. So the nodes do not change their state easily. It is similar with considerate node.

1. 이번 연구는 어디에 도움이 되는가?

This research can answer several questions.

First, how many leaders do we need in the organization?

Second, how do we make the structures of our group?

Third, which communication method is better for our group?

Fourth, who is the most powerful leader in our group?

To sum up, this research could be used to make network structures and organizations in the real world, and to solve the social conflicts.

1. 무슨 프로그램을 사용해서 연구를 했는가?

Mainly, I use python library, networkx. And Mysql database is used for saving simulation results.

1. 왜 Random Regular 네트워크와 BA 네트워크를 선택했는가?

Random Regular network has all characteristics of both regular network and random network. Small world network is also same. But random regular network is easy to control the number of edges. So I selected random-regular network.

And, BA network is a kind of scale-free network. It is totally different with RR network. So I chose this network.

1. Multiple indicators에서 왜 노드중심성의 랭크 합으로 계산했는가?

Identifying key nodes by multiple indicators is still an open problem because there are lots of ways to set up and optimize the weight of each node centrality.

It would be applied to machine learning or other skills.

Although my multiple indicators need to be researched further, here, I simplify the method by setting the weights as equal and calculate the summation of ranks,

1. Multiple indicators의 이전 연구는 어떠한가?

In previous research, the rank difference is used for finding the nodes of interest.

First, single indicators are selected with strong correlations. Second, the node of interest

is selected by rank difference of single indicators.

1. 이전 경쟁모델의 연구 결과는 무엇이며, 차이점은 무엇인가?

In previous research, the interconnected competition of the social network has been

researched by finding the threshold or critical point for consensus.

Besides, the main features, such as transition and cascade, are precisely characterized by the mean-field theory and magnetization.

In my thesis, I focus on the finding the feature of competition model by changing various conditions. Besides, I provided the characteristics of updating rules and key nodes in order to make the generalized model as future work.

1. 이전 updating rule의 결과는 무엇이며, 차이점은 무엇인가?

In economics and social networks, it has been proven that there exist different results between simultaneous and sequential interaction. The simultaneous method is very different from the sequential method. And, it is found out that a simultaneous rule makes a complete consensus much more difficult. However, they are considered on a single layer network.

In my thesis, updating rules are considered on the two-layer network. So updating rules become more various. 25 updating rules are researched. And then, it is found out which updating rules are very influential for changing the state.