User Study of Our Network Analysis System

Thank you for participating in our study! This session is completely voluntary and you can choose to stop at any point. Before we begin the session, please answer the questions below to give us a sense of your background. If you are not comfortable answering any of the questions, please let the moderator know and leave the response blank.

1. Please enter your Participant ID (ask the moderator)

_____

2. Please enter your gender.

_____

3. Please select your age range.

Mark only one oval.

- ◯ 18 -- 24
- ◯ 25 -- 34
- ◯ 35 -- 44
- ◯ 45 -- 54
- ◯ 55 -- 64
- ◯ 65 and over.

4. Please select your position in the University.

Mark only one oval.

- ◯ Undergraduate
- ◯ Graduate, Master's
- ◯ Graduate, Ph.D.
- ◯ Postdoctoral Researcher
- ◯ Faculty
- ◯ Other: _____

5. Please specify your major discipline of study or work.

_____

6. How familiar are you with Network Science (also known as Graph Theory)?

Mark only one oval.

	1	2	3	4	5	6	7	
I don't know what they are	◯	◯	◯	◯	◯	◯	◯	I use it regularly

7. If you are familiar with Network Science/Graph Theory, please describe the context in which you have used them.

_____

_____

_____

_____

_____

8. Please select network measures and metrics you know.

Check all that apply.

- [ ] Degree centrality
- [ ] PageRank
- [ ] Eigenvector centrality
- [ ] Katz centrality
- [ ] Closeness centrality
- [ ] Betweenness centrality
- [ ] k-core number (also know as degeneracy)

Start Tutorial and Training Session

Please stop and let the moderator know that you are ready for the tutorial and training session.

Training-1

Please stop and let the moderator know that you are ready for the task. Once the task is complete, you can return to this questionnaire and go to the next page.

Identify the uniqueness (if any) in the target network, compared to the background network, in terms of network structures, e.g., distributions of centralities and communities

9. Is there any uniqueness in the target network when compared to the background network?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Training-2

Please stop and let the moderator know that you are ready for the task. Once the task is complete, you can return to this questionnaire and go to the next page.

Explain found uniqueness (if there are multiples, explain each). If you judge there is no uniqueness, explain why you think so.

e.g.,
Why do you think the target network has the uniqueness?
Which features/what kind of network structures relate to the uniqueness?
Which nodes/regions relate to the uniqueness?
How different the related nodes above from other nodes in the target network?

10. Please answer here.

_____

_____

_____

_____

_____

Task 1-1

Please stop and let the moderator know that you are ready for the first task. Once the task is complete, you can return to this questionnaire and go to the next page.

Identify the uniqueness (if any) in the target network, compared to the background network, in terms of network structures, e.g., distributions of centralities and communities

11. Is there any uniqueness in the target network when compared to the background network?

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Task 1-2

Please stop and let the moderator know that you are ready for the next task. Once the task is complete, you can return to this questionnaire and go to the next page.

Explain found uniqueness (if there are multiples, explain each). If you judge there is no uniqueness, explain why you think so.

e.g.,
Why do you think the target network has the uniqueness?
Which features/what kind of network structures relate to the uniqueness?
Which nodes/regions relate to the uniqueness?
How different the related nodes mentioned above from other nodes in the target network?

12. Please answer here.

Task 2-1

Please stop and let the moderator know that you are ready for the next task. Once the task is complete, you can return to this questionnaire and go to the next page.

Identify the uniqueness (if any) in the target network, compared to the background network, in terms of network structures, e.g., distributions of centralities and communities

13. Is there any uniqueness in the target network when compared to the background network?

Mark only one oval.

- Yes
- No
- I'm not sure

Task 2-2

Please stop and let the moderator know that you are ready for the next task. Once the task is complete, you can return to this questionnaire and go to the next page.

Explain found uniqueness (if there are multiples, explain each). If you judge there is no uniqueness, explain why you think so.

e.g.,
Why do you think the target network has the uniqueness?
Which features/what kind of network structures relate to the uniqueness?
Which nodes/regions relate to the uniqueness?
How different the related nodes mentioned above from other nodes in the target network?

14. Please answer here.

Task 3-1

Please stop and let the moderator know that you are ready for the next task. Once the task is complete, you can return to this questionnaire and go to the next page.

Identify the uniqueness (if any) in the target network, compared to the background network, in terms of network structures, e.g., distributions of centralities and communities

15. Is there any uniqueness in the target network when compared to the background network?

Mark only one oval.

- Yes
- No
- I'm not sure

Task 3-2

Please stop and let the moderator know that you are ready for the next task. Once the task is complete, you can return to this questionnaire and go to the next page.

Explain found uniqueness (if there are multiples, explain each). If you judge there is no uniqueness, explain why you think so.

e.g.,
Why do you think the target network has the uniqueness?
Which features/what kind of network structures relate to the uniqueness?
Which nodes/regions relate to the uniqueness?
How different the related nodes mentioned above from other nodes in the target network?

16. Please answer here.

NASA TLX Questions

1. About the tasks to answer "Is there any uniqueness in the target network when compared to the background network?", please choose the option that best describes how you felt during the tasks.

17. Mental Demand: How mentally demanding was the task?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

18. Temporal Demand: How hurried or rushed was the pace of the task?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

19. Performance: How successful were you in accomplishing what you were asked to do?

Mark only one oval.

	1	2	3	4	5	6	7	
Perfect	◯	◯	◯	◯	◯	◯	◯	Failure

20. Effort: How hard did you have to work to accomplish your level of performance?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

21. Frustration: How insecure, discouraged, irritated, stressed, and annoyed were you?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

2. About the tasks to answer "Explain found uniqueness (if there are multiples, explain each). If you judge there is no uniqueness, explain why you think so?" Please choose the option that best describes how you felt during the tasks.

22. Mental Demand: How mentally demanding was the task?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

23. Temporal Demand: How hurried or rushed was the pace of the task?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

24. Performance: How successful were you in accomplishing what you were asked to do?

Mark only one oval.

	1	2	3	4	5	6	7	
Perfect	◯	◯	◯	◯	◯	◯	◯	Failure

25. Effort: How hard did you have to work to accomplish your level of performance?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

26. Frustration: How insecure, discouraged, irritated, stressed, and annoyed were you?

Mark only one oval.

	1	2	3	4	5	6	7	
Very low	◯	◯	◯	◯	◯	◯	◯	Very high

Final Impressions

General System Impressions. Please answer how much you agree with each statement below.

27. The system is easy to learn.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

28. The system is easy to use.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

29. The system is useful to find the uniqueness of a target network.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

30. The system is informative in understanding and explaining the found uniqueness in a target network.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

Usefulness of Functionalities Provided by the System. Please answer how much you agree with each statement.

31. The plot in the Contrastive Representation View was useful to perform the tasks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

32. The heatmap in the Feature Contribution View was useful to perform the tasks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

33. The visual linking with the Network Layout View was useful to perform the tasks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

34. The probability distributions of the target and background networks were useful to perform the tasks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly disagree	◯	◯	◯	◯	◯	◯	◯	Strongly agree

35. What did you think was the least useful function or feature of the system to answer the questions of "Is there any uniqueness in a target network?".

36. What did you think was the most useful function or feature of the system to answer the questions of "Is there any uniqueness in a target network?".

37. What did you think was the least useful function or feature of the system to answer the questions of "Explain found uniqueness".

38. What did you think was the most useful function or feature of the system to answer the questions of "Explain found uniqueness".

In-depth Interview

Please turn to the moderator for the last portion of the user study.

Thank you!

Thank you very much for your participation!