Reddit Interaction Model

Table 1: Networks used by the Reddit Interaction Model.

Network Name	Source -> Target	Required/ Optional	Default value	Range	Access Type
user active time network	user -> time	Required	0	{true, false}	iterative access, random access
knowledge network	user -> knowledge	Required	0	{true, false}	iterative access
knowledge trust network	user -> knowledge	Optional	0.5	[0, 1]	iterative access, random access
subreddit membership network	user -> knowledge	Required	0	{true, false}	iterative access, random access
knowledge type network	user -> knowledge type	Required	0	{true, false}	random access

The "`Reddit Interaction Model`" simulates information diffusion in a Reddit-based environment. It inherits functions from the social media no followers model provided by the Construct API. Within the model, there are two types of agents: users and moderators. Users make posts and comments, vote on posts and comments, and update their knowledge and knowledge trust based on the posts and comments they read. The moderators remove content and ban users from making posts in subreddits based on their attributes and the attributes of the subreddits they moderate.

To use the model, the input xml file must initialize each agent, timestep, knowledge, and subreddit involved in the simulation. Construct models each of these entities as a node. Consequently, to define when users are active, what communities they belong to, etc., the xml file must also include the networks listed in Table 1. The meaning of each network is as follows:

- `user active time network`: specifies when each user is "logged on" to the platform
- `knowledge network`: indicates the pieces of knowledge that each user is aware of at the start of the simulation
- `knowledge trust network`: indicates how much each user trusts a given piece of knowledge
- `subreddit membership network`: specifies each subreddit a user is subscribed to
- `knowledge type network`: indicates whether a piece of knowledge is true or false

Once the input xml file is created, the simulation can be run using the Reddit model. To do this on a windows machine:

1. Save the input file as "construct.xml" in the API_Functions folder.
2. Open the API_Functions > Construct_DLL.sln in visual studio.
3. Compile and run the solution (e.g., Debug > Start Debugging).
4. The solution should compile without error. If there are issues during the run, check the input xml file to ensure it is formatted correctly. The example_input_construct.xml discussed below can be used to check whether the error is with your input xml file or the solution itself.

To get started with an existing input xml file, please see the example on the next page.

Starter scripts for generating input xml files ("generate_input_file_simple.py" and "generate_input_file.py") and analyzing the simulation outputs ("calculate_end_knowledge.py" and "plot_knowledge_diffusion.py") are available in the Python_Modules folder.

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Example

An example xml input file is included in this folder. Before attempting to run the "example_input_construct.xml" file with the Reddit Model, please read the instructions above and move the file to the API_Functions folder and rename it to "construct.xml." This example should only take a few seconds to finish running.

In this example, there are 10 users (i.e., agents), 2 subreddits, 5 items of knowledge, and 5 timesteps. The knowledge network has a density of 0.1 and the knowledge trust network has a density of 0.05 with max values of 0.9 and min values of 0.1. The users are active for half of the timesteps and subscribed to half of the subreddits on average. Additionally, none of the knowledge items are classified as misinformation.

A second example input xml file is also included which runs a larger and longer simulation. It has 100 users, 10 subreddits, and 576 timesteps. It is recommended to start with the "example_input_construct.xml" file to understand how to format an input file. However, this file may be helpful for testing a larger input file. It should take less than a minute to run with the standard Reddit model.