# STRATEGY DESCRIPTIONS

|  |  |
| --- | --- |
| Random TopK | This strategy returns a random list of documents of size K. |
| Random TopK with Memory | This strategy returns a random list of documents of size K, it will remember and exclude documents that were in the list previously. |
| Like Documents with Shared Tags | The user will like documents that were returned by their rank strategy if that documents has at least one tag in common with the user. |
| Advertising Payoff | Rewards the user based on how many times documents with the same taste as them have been visited since the user’s last turn. |
| Selfish Payoff | Rewards the user based on how many documents returned by their rank strategy have tags in common with the user. Punishes the user based on how many documents returned by their rank strategy have no tags in common with the user or have already been seen. |
| Follow Similar Peers | The user will follow peers who have liked documents that were returned by the user’s rank strategy this turn, and that the user liked. |
| Publish with Threshold and Cost | If the payoff the user received this turn is above a certain threshold, then the user will publish a document and a cost will be subtracted from the user’s payoff. The published document will possess the same tags as the user who published them. |
| Viral Payoff | Rewards the user based on if documents with the same taste as them are consumed once. |

# CONSTANT DESCRIPTIONS

|  |  |
| --- | --- |
| Reward | This is the reward a peer will receive in their payoff function |
| Turn Cost | This is the starting payoff a peer has each turn, before rewards and punishments are applied |
| Publish Threshold | This is how much payoff a peer will need to have before they consider publishing a document |
| Publish Cost | When a peer publishes a document, this cost will be subtracted from their turn-payoff |
| TopK Size | How many files can a peer consume each turn? |
| Publishing Chance | The chance that a peer will publish a document when all other criteria for publishing are met |

LAB 1 – Small Network Analysis

# Simulator

|  |  |
| --- | --- |
| Simulation Run Time | 1000 |
| Simulations Run | 100 |

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 20 | Attack-profiles |
| 100 | Random-profiles |
| 12 | Documents |

Explained: Arbitrary assumption attackers make up around 20% of the peer network, and that the file to peer ratio is 1:10

# Breed Profiles

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Population Name | Rank Strategy | Like Strategy | Payoff Strategy | Follow Strategy | Publish Strategy | Tag Values |
| Attack-profiles | N/A | N/A | Advertising Payoff | N/A | Publish-with-Threshold-and-Cost | 1 |
| Random-profiles | Random TopK | N/A | Selfish Payoff | N/A | Publish-with-Threshold-and-Cost | 0 |
| Documents | N/A | N/A | N/A | N/A | N/A | 1 or 0 (evenly divided) |

Explained: Random profiles are chosen for their simplicity. They are simple because they do not use like or follow strategies.

# Constants

|  |  |  |
| --- | --- | --- |
| Constant Name | Attack Peers Value | Random Peers Value |
| Reward | 0.05 | 1.5 |
| Punishment | N/A | 0.5 |
| Turn Cost | -1 | 0 |
| Publish Threshold | 4 | 4 |
| Publish Cost | 4 | 4 |
| TopK Size | N/A | 5 |

Explained: The constants were chosen in hopes of keeping peers and attackers in close competition. The thresholds are fairly high relative to the rewards in order to avoid the network being flooded

# Notes

Attackers benefit from having very high publishing thresholds because of the limit of documents that consumer peers can consume each turn. This is not necessarily realistic: for one thing, they advertiser could quite probably have a heart attack and die from excitement (thus having a detrimental effect on their next turn). One way around this is to create a logarithmic scoring for advertisement success.

LAB 2 – Small Network Viral Analysis

# Simulator

|  |  |
| --- | --- |
| Simulation Run Time | 1000 |
| Simulations Run | 100 |

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 20 | Attack-profiles |
| 100 | Random-profiles |
| 12 | Documents |

Explained: Arbitrary assumption attackers make up around 20% of the peer network, and that the file to peer ratio is 1:10

# Breed Profiles

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Population Name | Rank Strategy | Like Strategy | Payoff Strategy | Follow Strategy | Publish Strategy | Tag Values |
| Attack-profiles | N/A | N/A | Viral Payoff | N/A | Publish-with-Threshold-and-Cost | 1 |
| Random-profiles | Random TopK | N/A | Selfish Payoff | N/A | Publish-with-Threshold-and-Cost | 0 |
| Documents | N/A | N/A | N/A | N/A | N/A | 1 or 0 (evenly divided) |

Explained: Random profiles are chosen for their simplicity. They are simple because they do not use like or follow strategies.

# Constants

|  |  |  |
| --- | --- | --- |
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