# 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. If a user has already seen a document, then no rewards or punishments are applied to it (it has already been consumed, the user will ignore it).

**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.

# CONSTANT DESCRIPTIONS

|  |  |  |
| --- | --- | --- |
| Constant Name | Attack Peers Value | Random Peers Value |
| Advertising Reward per View | 0.05 | N/A |
| Turn Cost | -1 | N/A |
| Publish Threshold | 4 | 4 |
| Publish Cost | 4 | 4 |
| TopK Size | N/A | 5 |
| Consumer Reward | N/A | 1.5 |
| Consumer Punishment | N/A | 0.5 |
| Publishing Chance | 0.2 | 0.2 |

LAB 1 – Initial testing

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 2 | Attack-profiles |
| 2 | Random-profiles |
| 50 | Documents |

# 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 with Memory | Like Documents with Shared Tags | Selfish Payoff | Follow Similar Peers | Publish with Threshold and cost | 0 |
| Documents | N/A | N/A | N/A | N/A | N/A | 1 or 0 (random) |

# Constants

Advertisers reward per view is set at 1.

Publish threshold is 3

Publish cost is 2

TopK size is 5

# Results

# Observations

There is an initial rise in turn-payoffs for attack peers, and then it drops off, why?

Turn payoff for random peers is around 0 but then drops off before eventually increasing again, why?

LAB 2 – Simplified testing

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 1 | Attack-profiles |
| 1 | Random-profiles |
| 50 | Documents |

# 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 | N/A | 1 |
| Random-profiles | Random TopK with Memory | Like Documents with Shared Tags | Selfish Payoff | N/A | N/A | 0 |
| Documents | N/A | N/A | N/A | N/A | N/A | 1 or 0 (random) |

# Constants

Advertisers reward per view is set at 1

Publish threshold is 3

Publish cost is 2

TopK size is 5

# Observations

The first turn of the attacking peer is smaller because there is a high chance that no other peers in the network have had their turn yet.

The trail beyond turn 10 for attack peers turn-payoff, despite random peers exhausting all possible documents by then, is because the random peer’s turn count may be less than 10 when the attack peer’s turn count exceeds 10. This becomes increasingly unlikely as time goes on.

LAB 3 – Simplistic testing

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 1 | Attack-profiles |
| 1 | Random-profiles |
| 50 | Documents |

# 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 | N/A | 1 |
| Random-profiles | Random TopK | N/A | Selfish Payoff | N/A | N/A | 0 |
| Documents | N/A | N/A | N/A | N/A | N/A | 1 or 0 (random) |

# Constants

Advertisers reward per view is set at 1

Publish threshold is 3

Publish cost is 2

TopK size is 5

LAB 4 – Medium Network

# 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 |
| Advertising Reward per View | 0.15 | N/A |
| Turn Cost | -1 | N/A |
| Publish Threshold | 4 | 4 |
| Publish Cost | 4 | 4 |
| TopK Size | N/A | 5 |
| Consumer Reward | N/A | 1.5 |
| Consumer Punishment | N/A | 0.5 |

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

**This doesn’t make sense, as the attackers flood the network, they should experience and almost exponential rise in turn-payoff.**

**Or… The more turns an attacker has had in a short amount of time, the last chance consumer peers have had to visit the advertising files. So the small ascension in the first few turns for attackers is because of the predicted network flooding, then the fall off is because the attackers are too active compared to their network (and because since the attackers are viral, the more turns they’ve had the more likely each peer is to have downloaded the file, so their targeted group gets smaller and smaller)a**

LAB 5 – Balancing lab4

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 10 | 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 |
| Advertising Reward per View | 0.05 | N/A |
| Turn Cost | -1 | N/A |
| Publish Threshold | 4 | 4 |
| Publish Cost | 4 | 4 |
| TopK Size | N/A | 5 |
| Consumer Reward | N/A | 1.5 |
| Consumer Punishment | N/A | 0.5 |

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. Since the last simulation, Advertising reward was lowered to try and lessen the dominance of advertising profiles.

Despite consumer peers only being rewarded for new documents that match their taste, their turn-payoff values are more or less even because they quickly flood the market with new files. The turn-payoff should drop if new files are made less common.

The average age of the network for nth turn of a peer shows us how many other peers have had turns.

LAB ６ – Publishing Chance

# Breed Populations

|  |  |
| --- | --- |
| Initial Population Size | Population Name |
| 10 | 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

|  |  |  |
| --- | --- | --- |
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| Consumer Punishment | N/A | 0.5 |
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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. Since the last simulation, Advertising reward was lowered to try and lessen the dominance of advertising profiles.