NIBBS-Search Algorithms Pseudocode

Algorithm 1: NIBBS-Search: Network Instance Based Biased Subgraph Search

Input: P—A set of positive network instances
N—A set of negative network instances
ϕ_0—The minimum bias score for seed expansion
Output: M—A set of maximally-biased subgraphs

```
1  Γ ← GenerateSeedSets();
2  Remove all seed sets S from Γ where φ(S, P, N) < φ_0;
3  foreach seed set S ∈ Γ do
4      M = M ∪ ExpandSeedSet();
```

Algorithm 2: GenerateSeedSets

Input: E_G—The edge set of the network map
κ—The maximum size of the seed set
Output: R—A set of seed sets

```
1  E' ← Sort the edges in E_G by their φ-values;
2  while E' contains unmarked edges do
3      e_0 = ← Unmarked edge in E' with the least φ-value;
4      S ← S ∪ e_0;
5      Mark e_0;
6      C ← GenerateSeedCandidates(S) ;
7      while C ≠ ∅ AND |S| ≤ κ do
8          e ← Best candidate in C;
9          S ← S ∪ e;
10         Mark e;
11         C ← GenerateSeedCandidates(S)
12     R ← R ∪ S;
```

Algorithm 3: ExpandSeedSet

Input:
S—A seed set of edges
α—Expansion bound
Output: S—The expanded set of edges

```
1 C ← GenerateExpansionCandidates(S, α);
2 while C ≠ ∅ do
3 |   e ← Select best candidate from C;
4 |   S ← S ∪ e;
5 |   C ← GenerateExpansionCandidates(S, α);
```