

Symbols

$G(V, E)$	A social network with vertex set V and edge set E
N	The number of nodes in the network ($ V $)
M	The number of Edges in the network ($ E $)
$N(u)$	The neighbors set of node u
V_a	The set of active nodes
S	The seed set
k	The number of nodes in seed set ($ S $)
$p_{x,y}$	The influence probability of x to adjacent node y .
$\sigma(S)$	The expected influence of seed set in the network, i.e., $Inf(S)$
m	The number of products for advertising
l	The number of channel of interaction or relationship
L	The set of relationships
C	The community structure of G
C_i	The community $C_i \in \{C_1, C_2, \dots, C_m\}$
I	The number of rounds of simulation
f	The fraction of seeds to be selected from communities
r	The fraction of nodes in the community to be non-desirable

h	The fraction of nodes in non-desirable to be taken from nodes joining different communities
pop	The population of swarm
$V(j)$	The velocity vector of particle j
$pos(j)$	The position vector of particle j
$pbest(j)$	The personal best position vector of particle j
$gbest$	The global best position vector (solution)
$Imax$	The maximum number of iteration
δ	Inertia weight $\delta \in [0, 1]$
$C_{L.x}$	The community label of node x
$D(C_i)$	The detachability index of community C_i
$CI(x,y)$	The community index of existing link (x,y)
$SI(x,y)$	The similarity index of existing link (x,y)
$LS(x,y)$	The likelihood score of non-existing link (x,y)