Algorithm 1 HRindex 插入更新算法

```
1: function updateInsertEdge(src, dst, timestamp)
2:     G_t = originGraph[timestamp]
3:     SCC_t = SCCGraph[timestamp]
4:     if !G_t.exist(src) then
5:         updateAddNode(ur, oldHRindex)
6:     end if
7:     if !G_t.exist(dst) then
8:         updateAddNode(ur, oldHRindex)
9:     end if
10:    G_t.insert(ur.src, ur.dst)
11:    SCC_src = SCC_t.find(ur.src)
12:    SCC_dst = SCC_t.find(ur.dst)
13:    if SCC_src == SCC_dst then
14:        return
15:    else
16:        SCCGraph[timestamp].insert(src, dst)
17:        cycle ← findCycle(SCCGraph[timestamp])
18:        while cyele.size != 0 do
19:            SCCID_new ← merge(SCCGraph[timestamp], cycle)
20:            ▷ Firstly, we process the newly added SCC node after merging.
21:            In = SCC_t.getIncomingEdge(SCCID_new)
22:            Out = SCC_t.getOutgoingEdge(SCCID_new)
23:            if newSCCID exist in other timestamp then
24:            else
25:                newItem = getNITItem(In, Out)
26:                NIT.push(newItem)
27:            end if
28:        end while
29:    end if
30: end function
```