Algorithm 1 BinID* : A Probabilistic Binary-Tree Namespace

Result: Each agent gets globally-unique Id.

```
myId ← ALLZEROS

while NOT unique OR NOT alarm do
    for i ← 0 to MAXBITS by BIT do
        currentbit ← FlipCoin();
        if CountNeighbors() ¿ 2 then
            myId| = currentbit ≪ i
            while group density NOT together do
                FindMyName(my Id)
            end
        else
            same ← true
            while same do
                if SuspiciousActivity(duelCount) then
                    alarm ← true
                    break
                else
                    entangled ← FlipCoin()
                    same ← CheckFlip(entangled)
                    increment duelCount
                end
            end
        end
    end
end


if alarm then
    Sound the alarm!
else
end


myLocalPartition ← PartitionNamespace(myId)

while overlaps do
    myLocalPartition ← PartitionNamespace(myId)
    overlaps ← CheckOverlaps(myLocalPartition)
end


alarm ← CheckShannon(myLocalPartition)
if alarm then
    Sound the alarm!
else
end


CheckShannon(localPartition, numBots) for i ← 0 to numBots by BOT do
    shannonNow ← BuildShannon(namespace[i])

end
if shannonNow == EXPECTED then
    do nothing
else
    alarm ← true

end
```