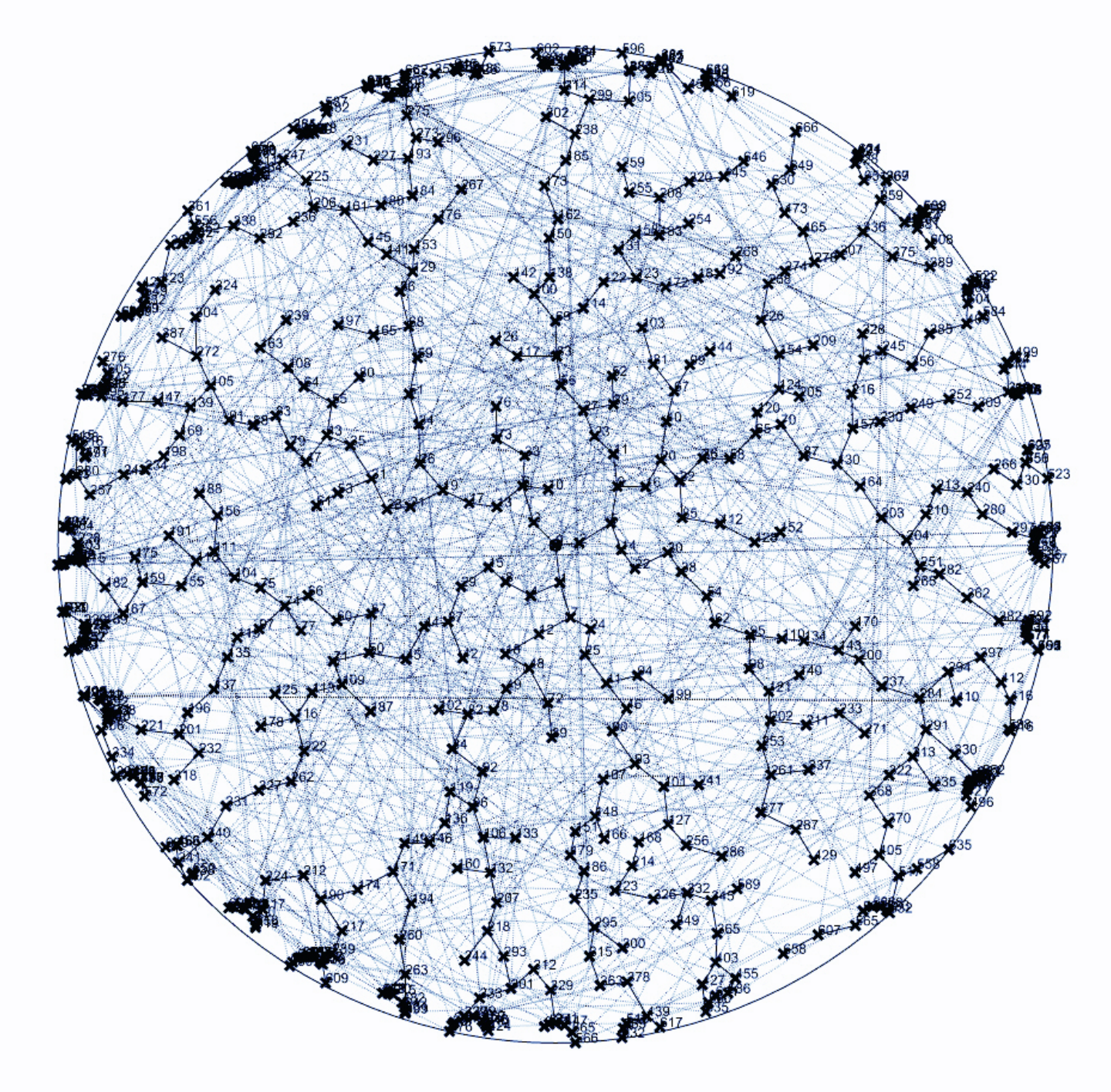
GRASSHOPPER VB WORKSHOP - Diffusion Limited Aggregation System

Digital Media and Material Practice, Fall 2012, Harvard, GSD

GH version 0.9.0014

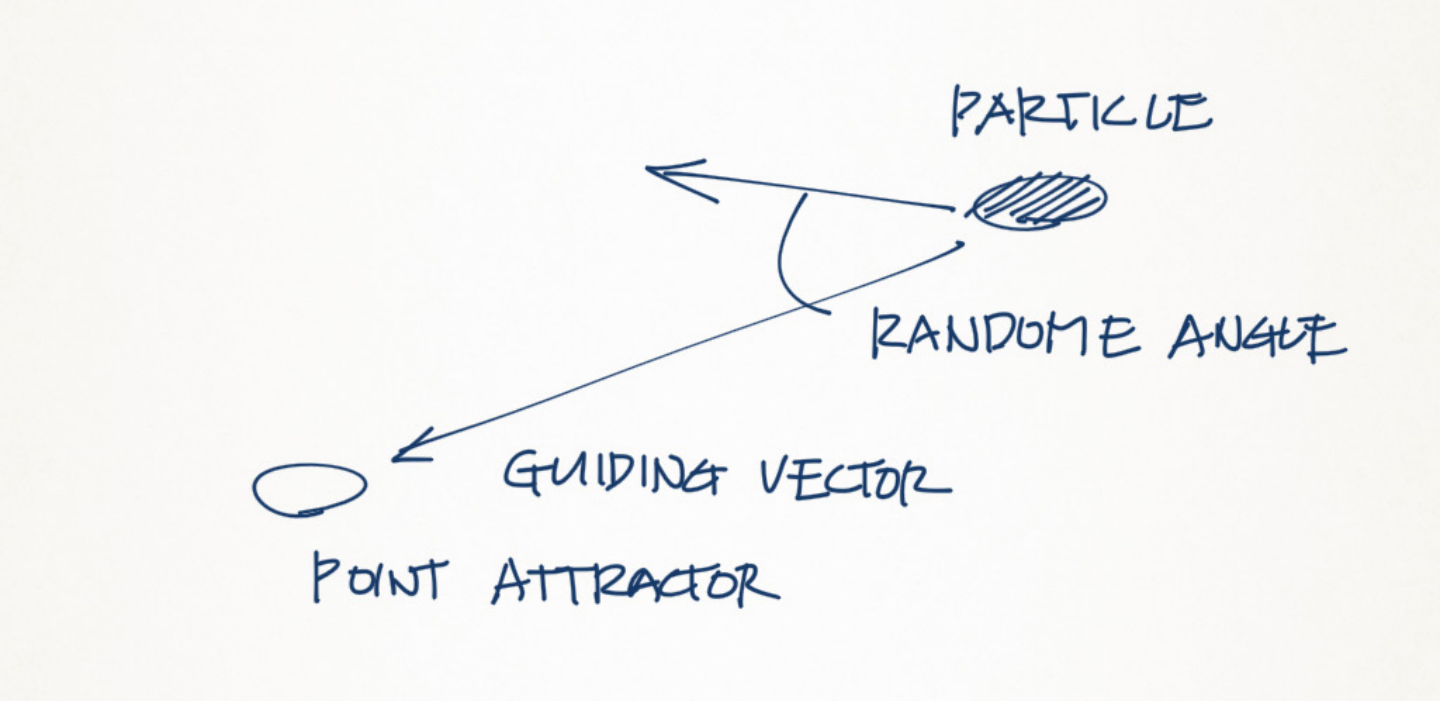
woojae sung · woojae.sung@yahoo.com · www.woojsung.com



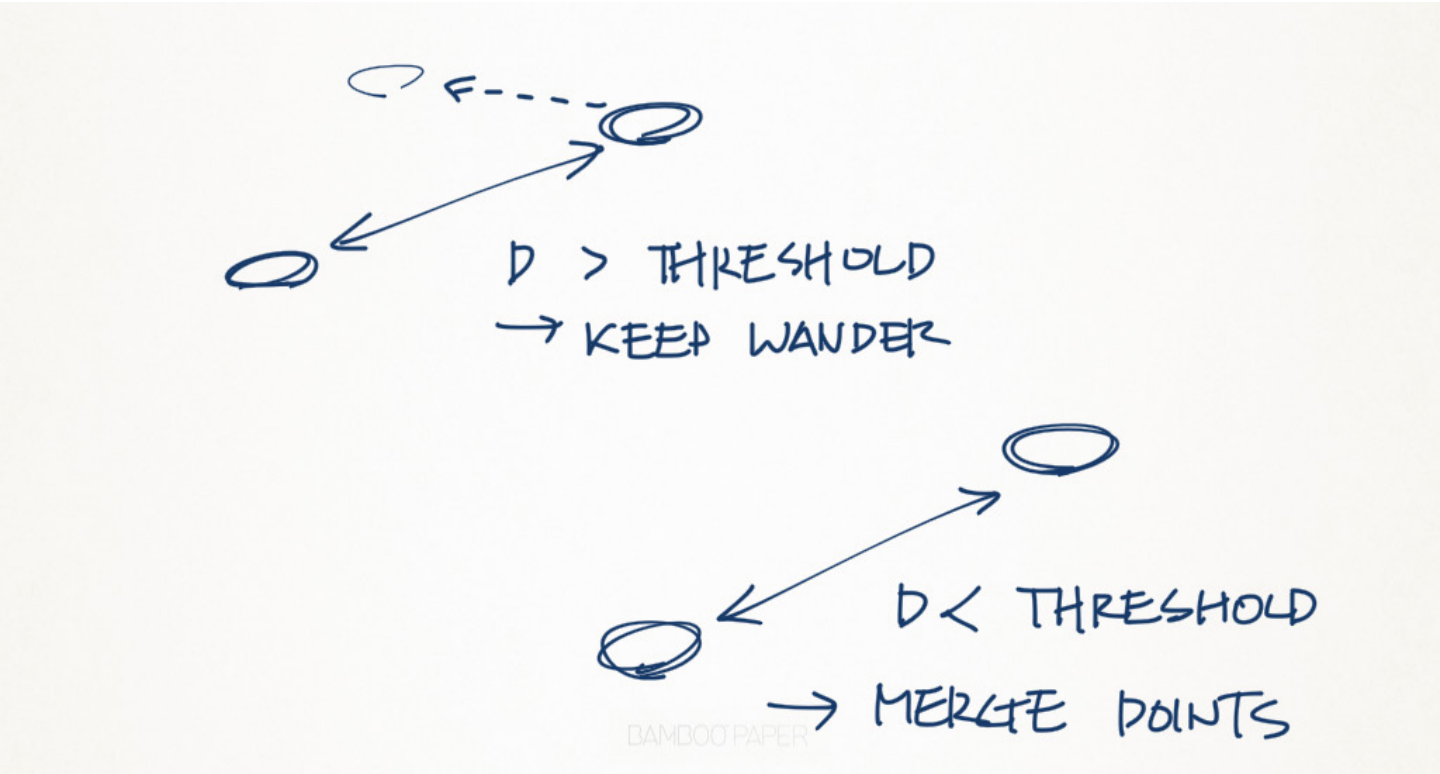
DIFFUSION-LIMITED AGGREGATION

The process whereby particles undergoing a random walk due to Brownian motion cluster together to form aggregates of such particles (from Wikipedia). This can be simply break down into two main processes;

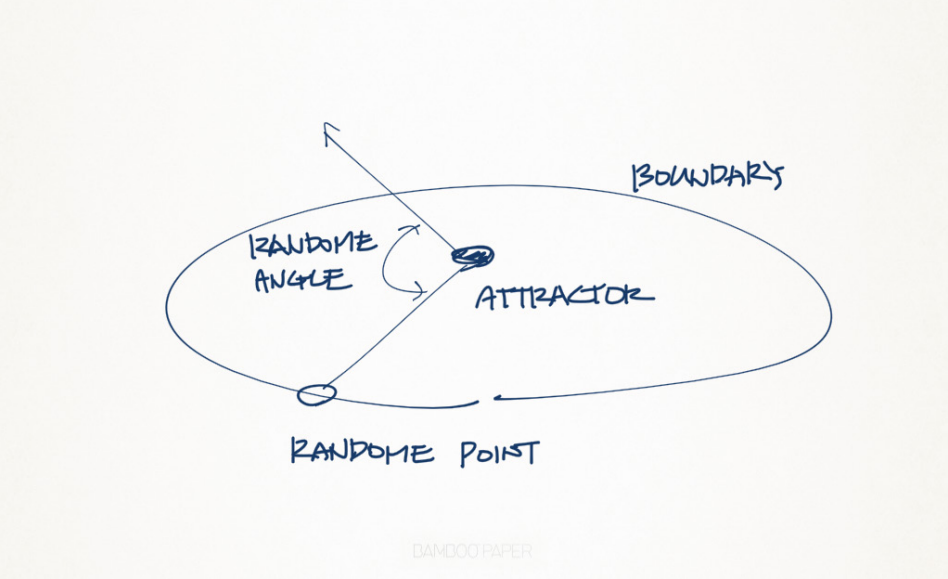
Diffusion (Wandering Particle) *- Start with two points. One as a static working as an attractor, and the other as a wandering particle that gradually approaches toward the attractor over time.*



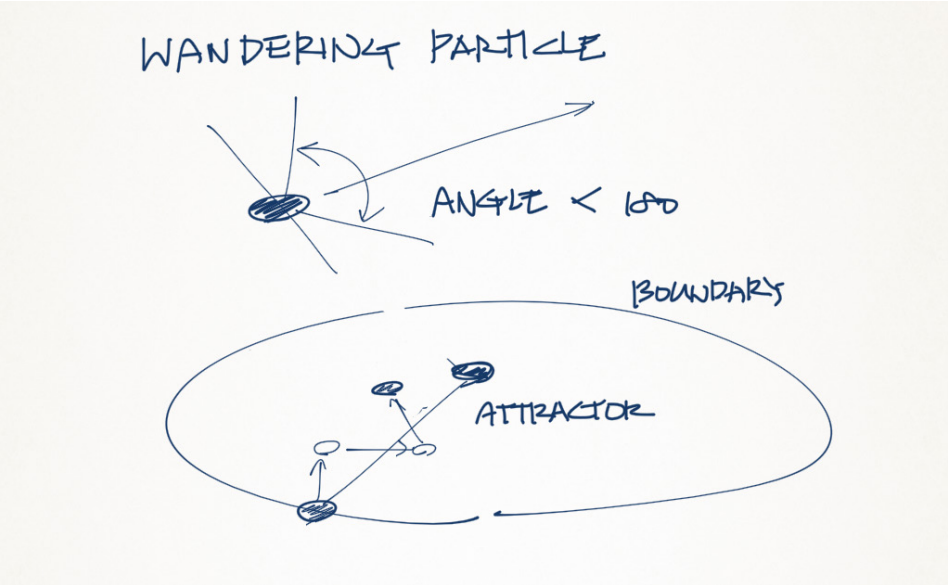
Aggregation (Sticking Particles within threshold) *- Constantly check if those two points are close enough. If yes, stop wandering and merge two points by connecting them with a single line. Otherwise, let the particle wander until it gets in to the threshold.*



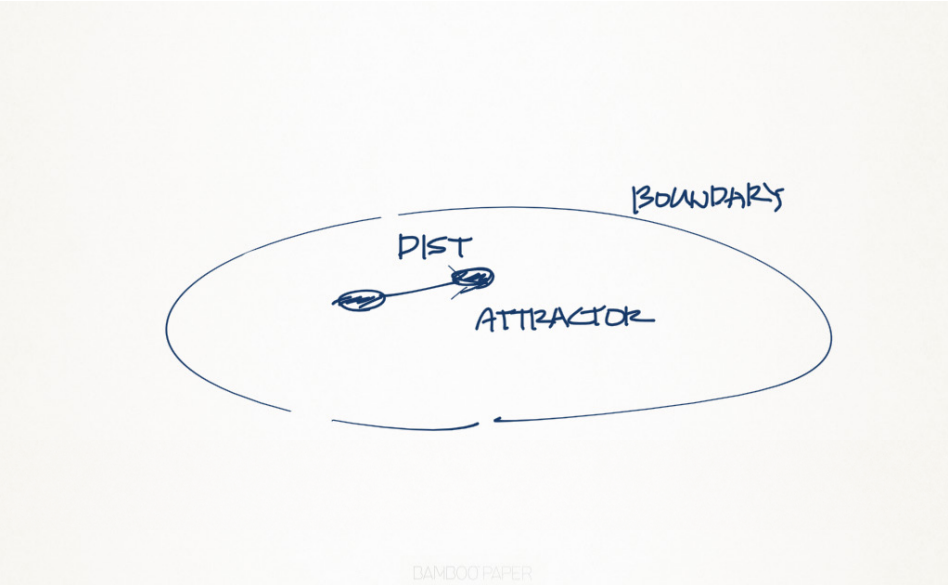
PROCESS



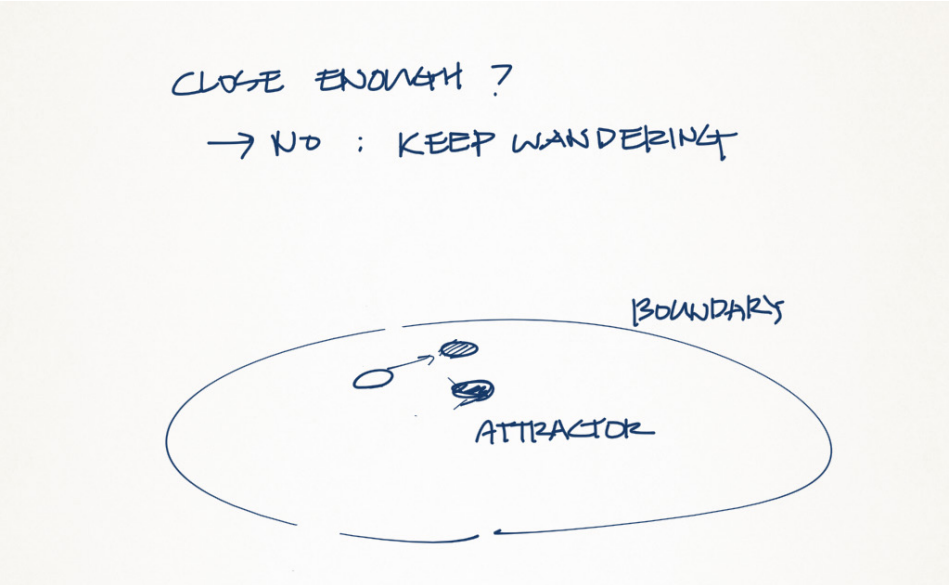
step 01
Get a random point on a given boundary. This point will gradually approach to an attractor as it wander within the boundary. The attractor will be the first aggregate as it still serve as an attractor.



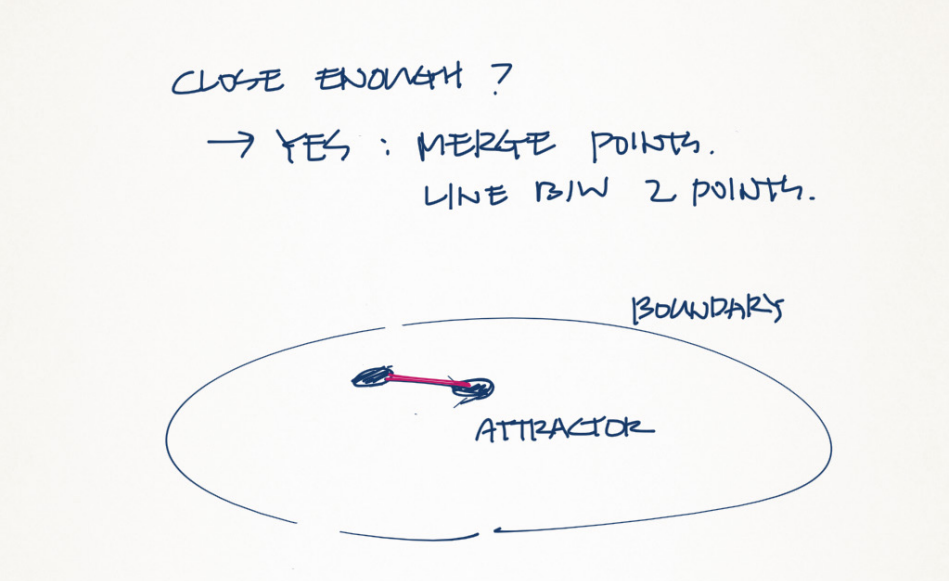
step 02
When wandering a particle, keep the random angle less than 180 degrees to force the particle move toward the attractor. Otherwise, the particle might be lost in the space.



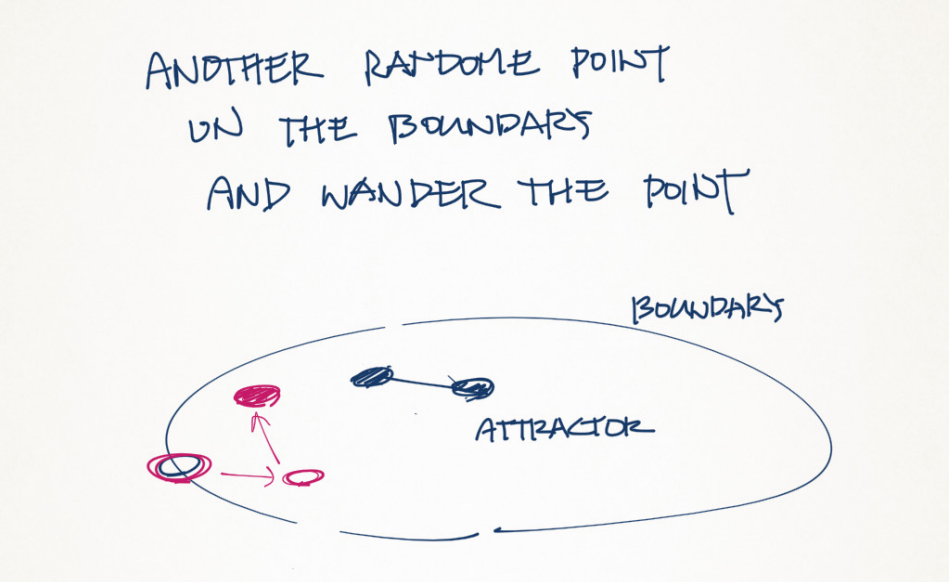
step 03
Every time moving the particle, check the distance between the two points to see if they are close enough to get merged.



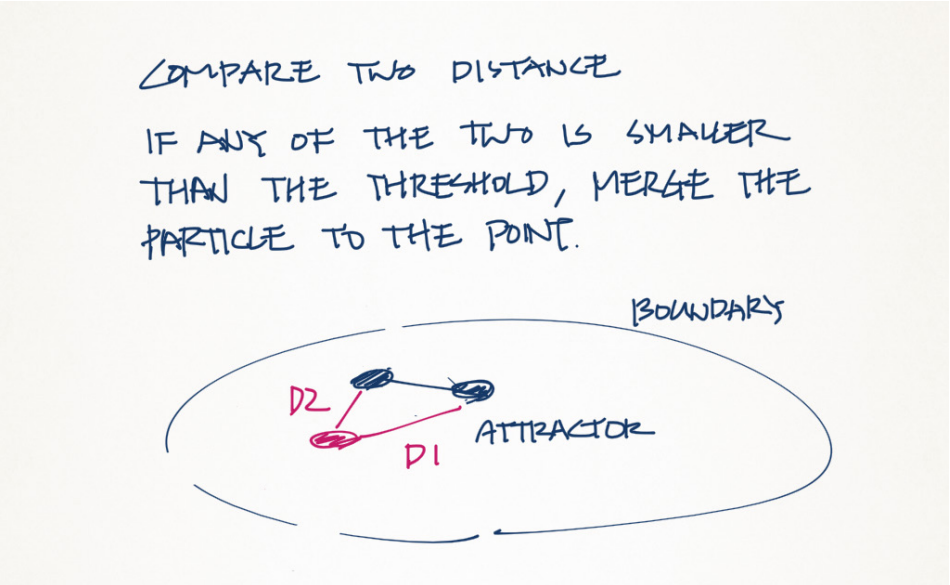
step 04
If they are not close enough, then keep the particle wandering.



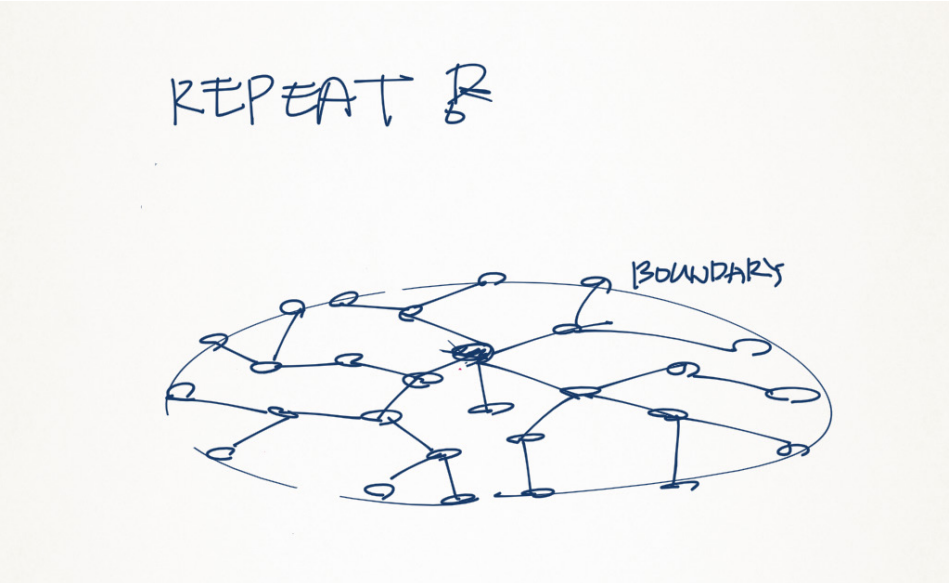
step 05
If yes, merge two points, connecting them with a single line. Two points form a new set of aggregate.



step 06
Get another random point on the boundary and get it wander.



step 07
Check distance from the wandering particle to each aggregate every time the particle moves. If any of the two distance is within the threshold, merge the particle to the nearer aggregate. If none of the two meets the condition, keep it wandering.



step 08
Repeat until you like the pattern.