# Research Progress Presentation 3

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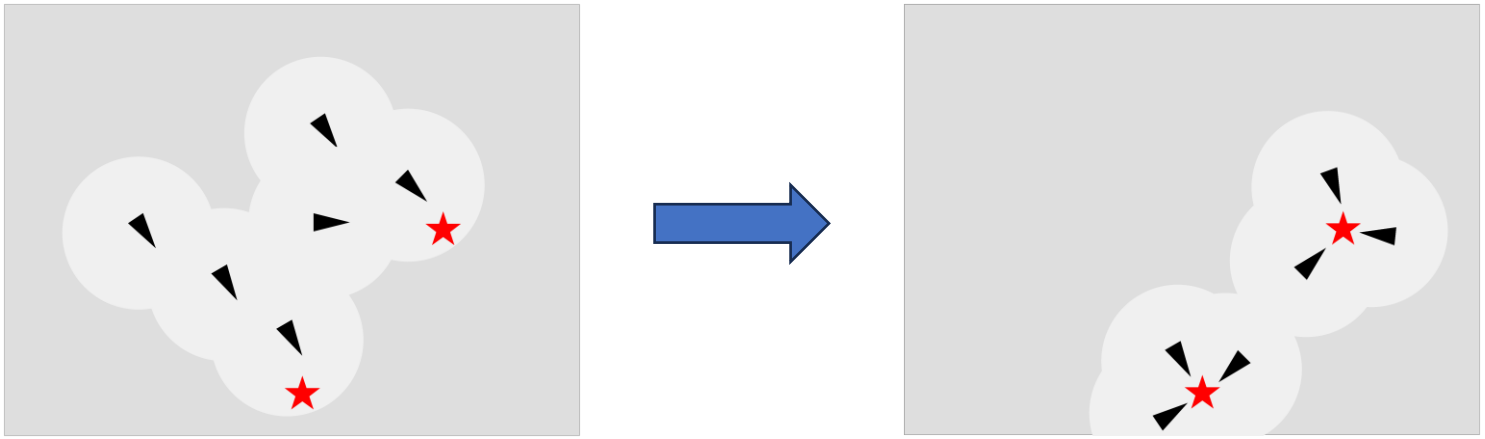
# Outline

- Recap
- Progress
  - Grouping mechanism (splitting of tasks)
  - Obstacle avoidance
  - Simulation video

# Problem Setting (Recap)

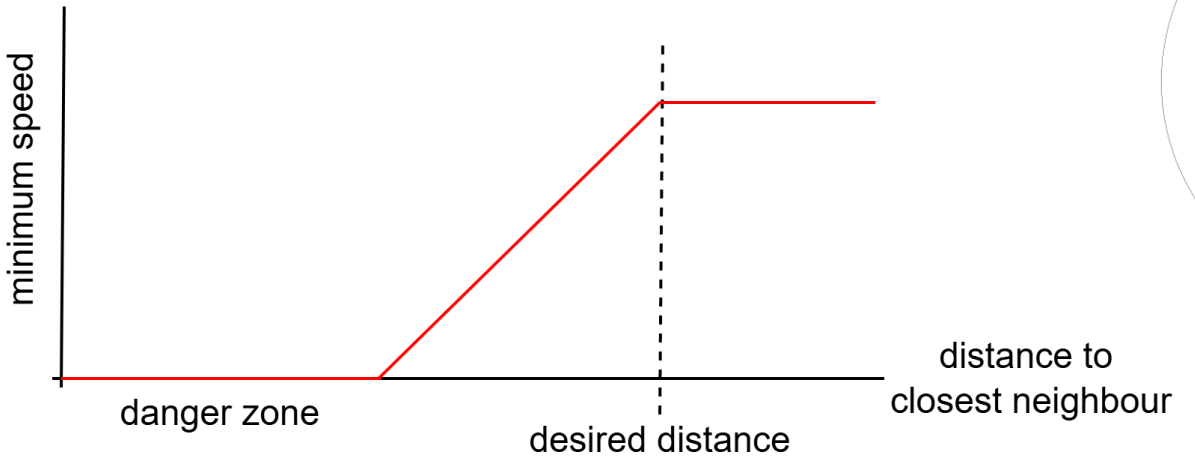
- Bounded undiscovered 2D area
- Goal: to cover all targets & ability to split task
- Each boid runs on the same code, in parallel
  - Info at time t → calculate move for time t+1
- No memory of map

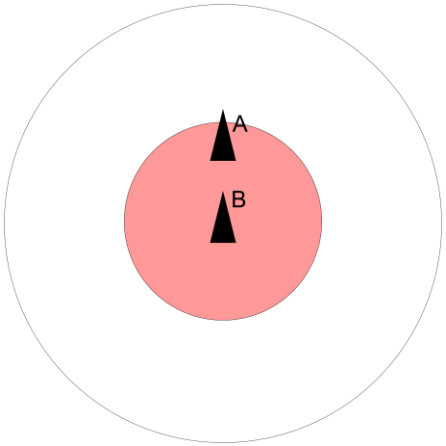


# Problem Setting (Recap)

To cover more area (not stay in the same place)

- Design of minimum speed constraint
  - Promote exploration
  - While still prioritizing no collisions

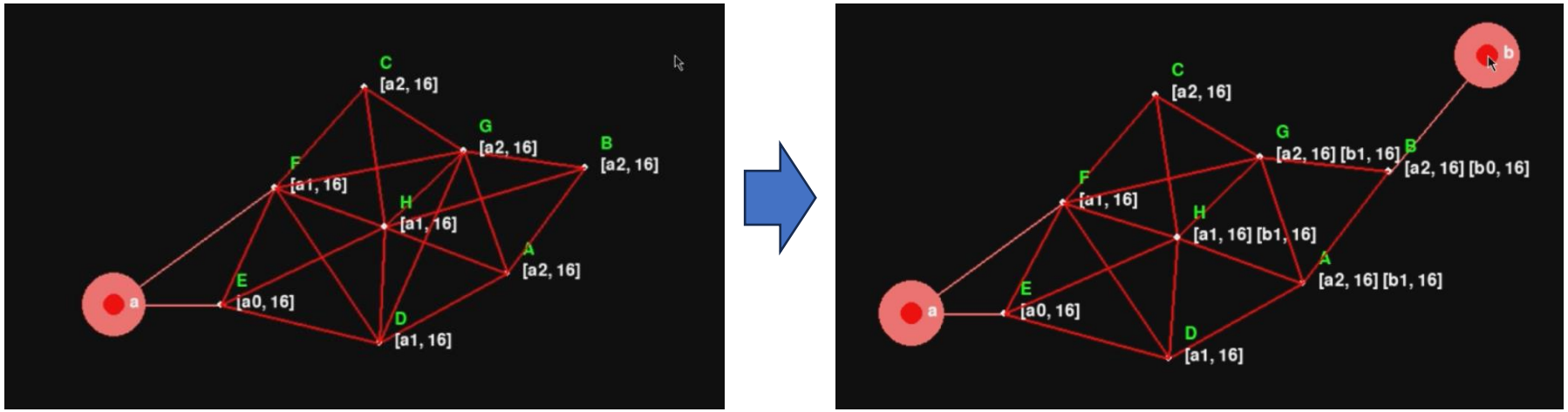


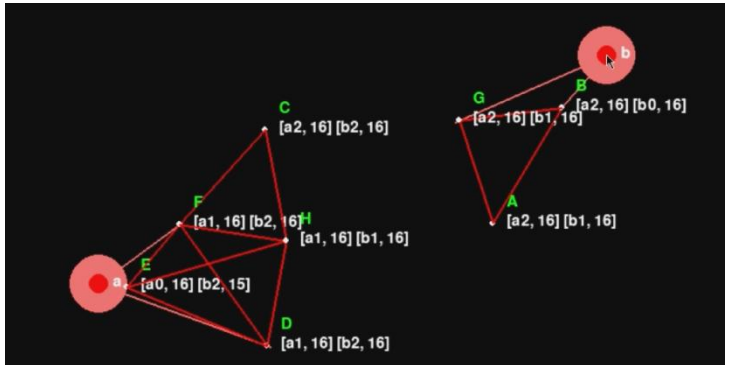



# Task Splitting (Recap)

Determined by which target has the lowest rank

- If same rank for both targets, go for the first

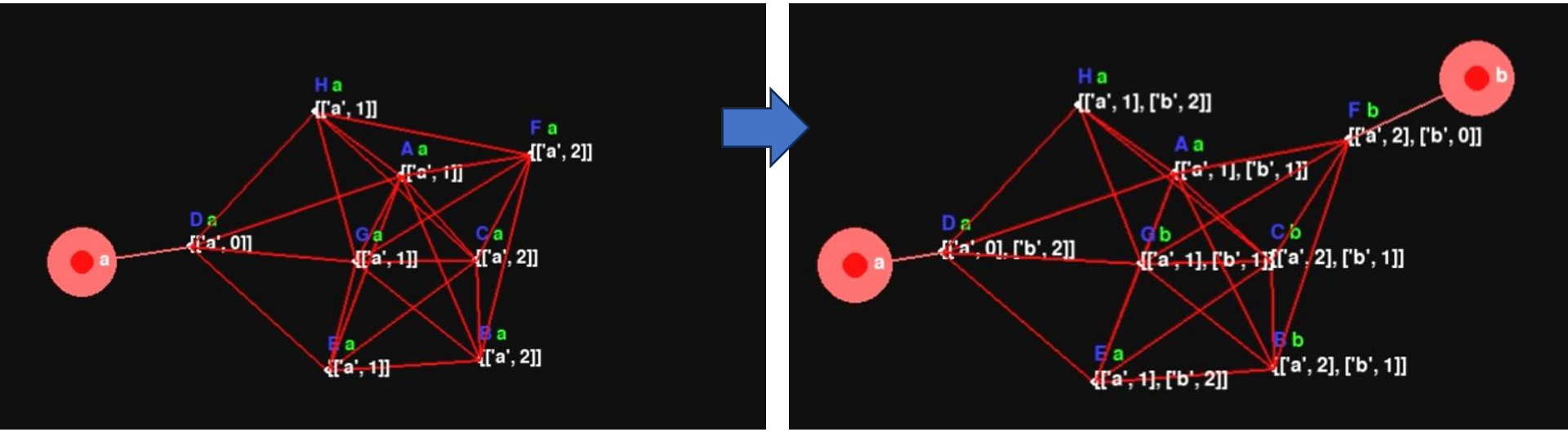


# Task Splitting (Revised)

Determined by which target has the lowest rank

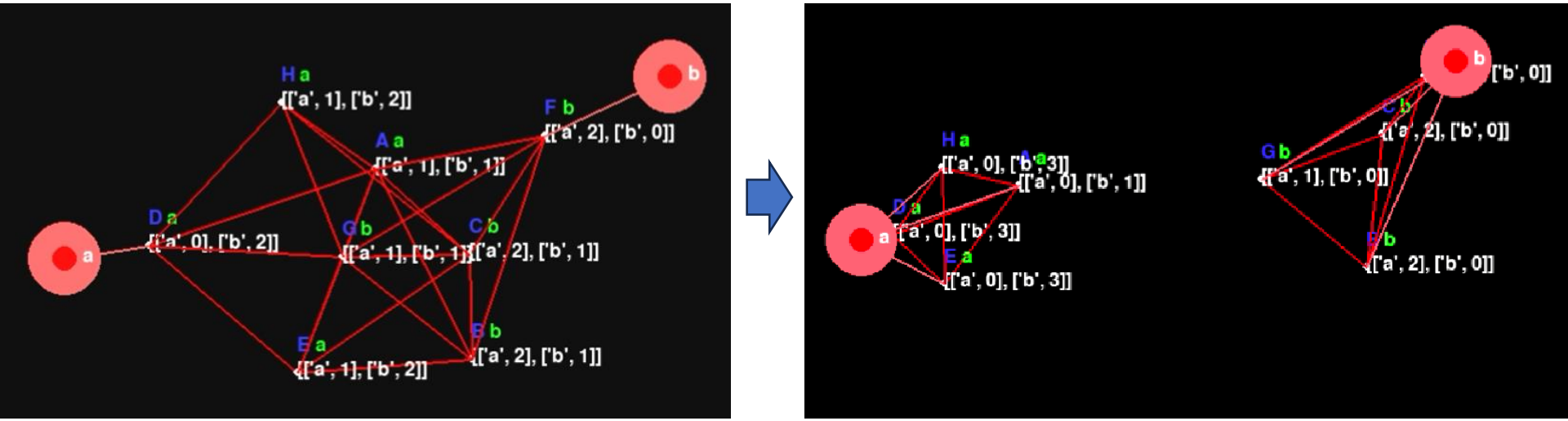
- If same rank for multiple targets, select random



# Task Splitting (Revised)

Alignment, cohesion: neighbors with same target

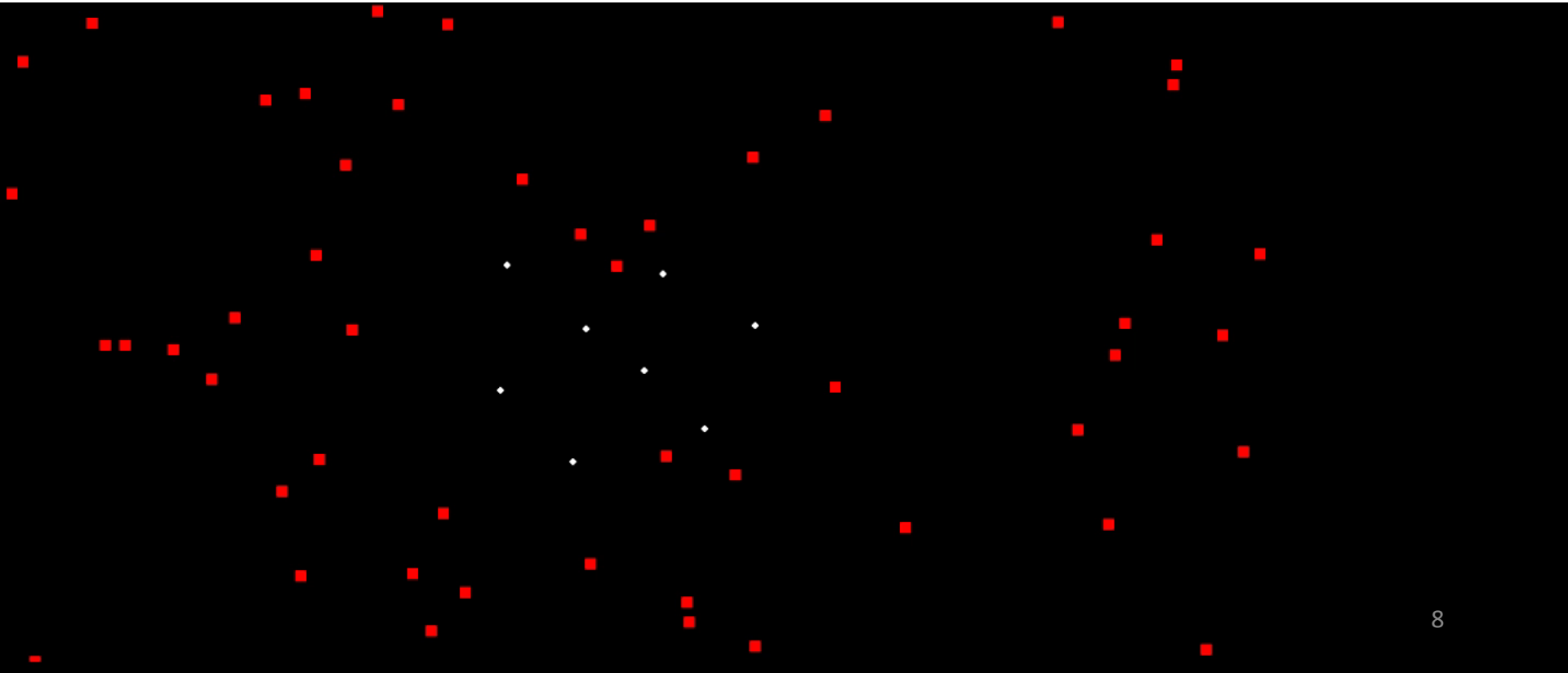
Separation: all neighbors



# Obstacle avoidance

Works like separation, but

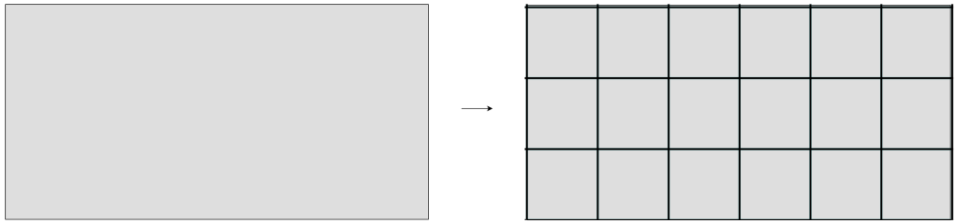
- Activated at a closer distance
- Greater weight



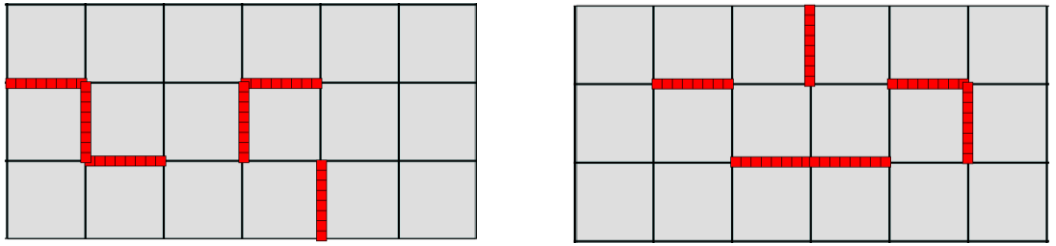
# Creating random maps

- Use a line of particles as a wall

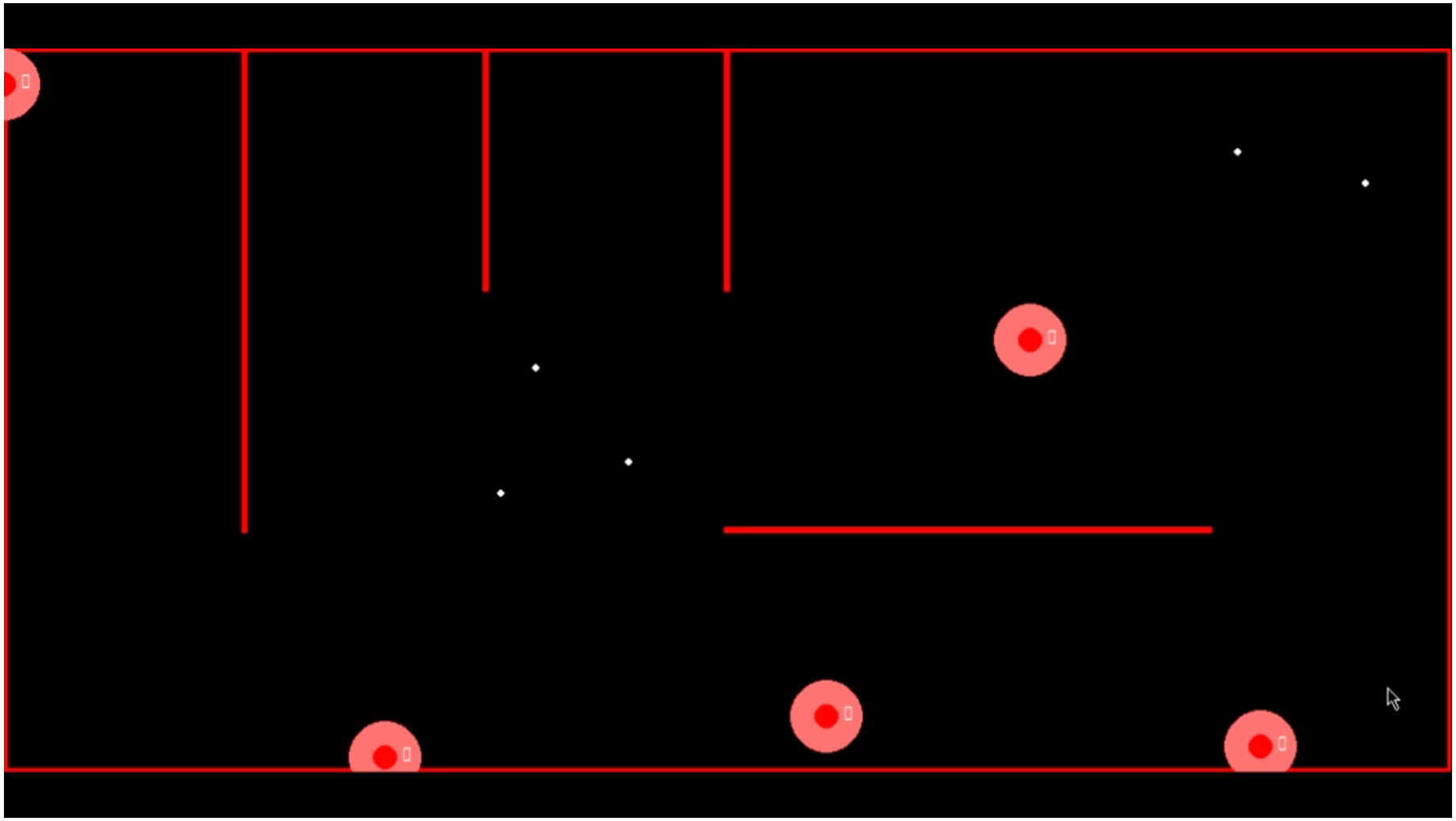
- Make a grid on the bounded area



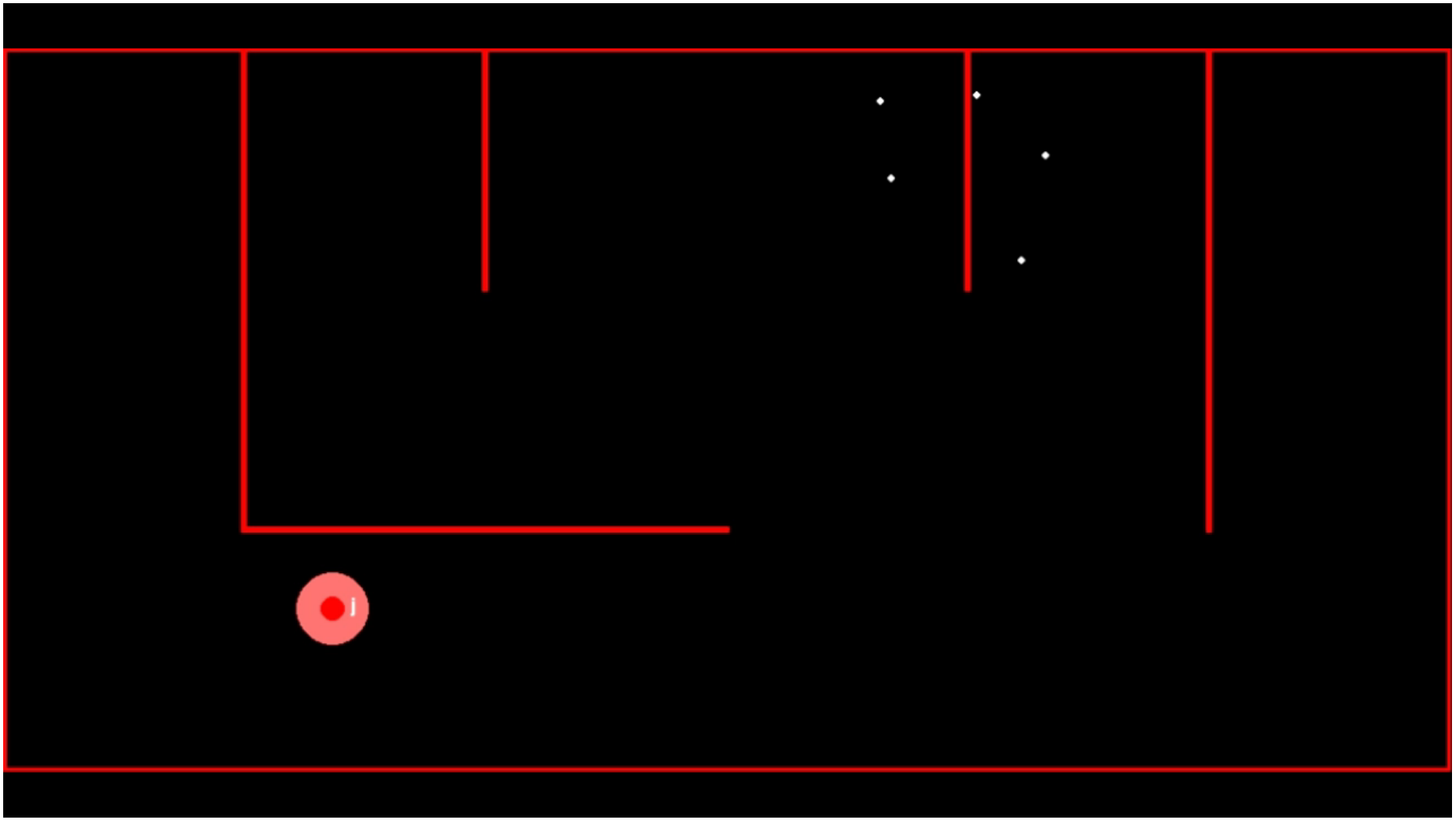
- Randomly selecting whether each edge will have a wall or not



# Simulation with walls (1)



# Simulation with walls (2)



# Future Work

- Create a leader boid with memory for mapping
  - For better navigation
- Modify the wall properties
  - Make so that boids cannot communicate through a wall