What I did in the past two months

- New simulator
  - Getting started with twodee
  - Extension (proximity, camera, leds, collisions...)
  - Implementation of chaining behaviour
- Preparation of experiments
  - Parameter landscape for various situations
- Some reading on sensor networks
- Excellent holiday

Experiments

- Objectives:
  - Find optimal parameters for given task
  - Understand impact of parameters
- Sources of variation:
  - Two probability parameters: 0, 2^-10,2^-9,..2^0
  - Number of sbots: 10, 20
  - Arena size: (5x5)m^2
  - Number of preys: 0, 1, 2, 4
  - Distance to prey: 60, 120, 180, 240, 300 cm

Experiments (cont.)

- Measures:
  - Percentage arena explored
  - Time until nest found by n-th sbot
  - Time until n-th prey found
  - Chain length (max/dynamic)
 - State dynamics

Experiments (cont.)

- Procedure:
  - Sbots are placed at random positions
  - Finished without prey: 3h
  - Finished with prey: min(t(success),3h)
  - Prey removed after connected for
    certain amount of time
    --> Problem: chain stays, robots are recruited to prey
    --> Possible solution: include assembly and retrieval

Experiments (cont.)

- Anticipated results:

  - Optimal parameter set depends on task
    --> Possibility for adaptive controller

  - Linear relationship between time to find prey and number of preys

  - Quadratic relationship between time to find prey and distance to prey
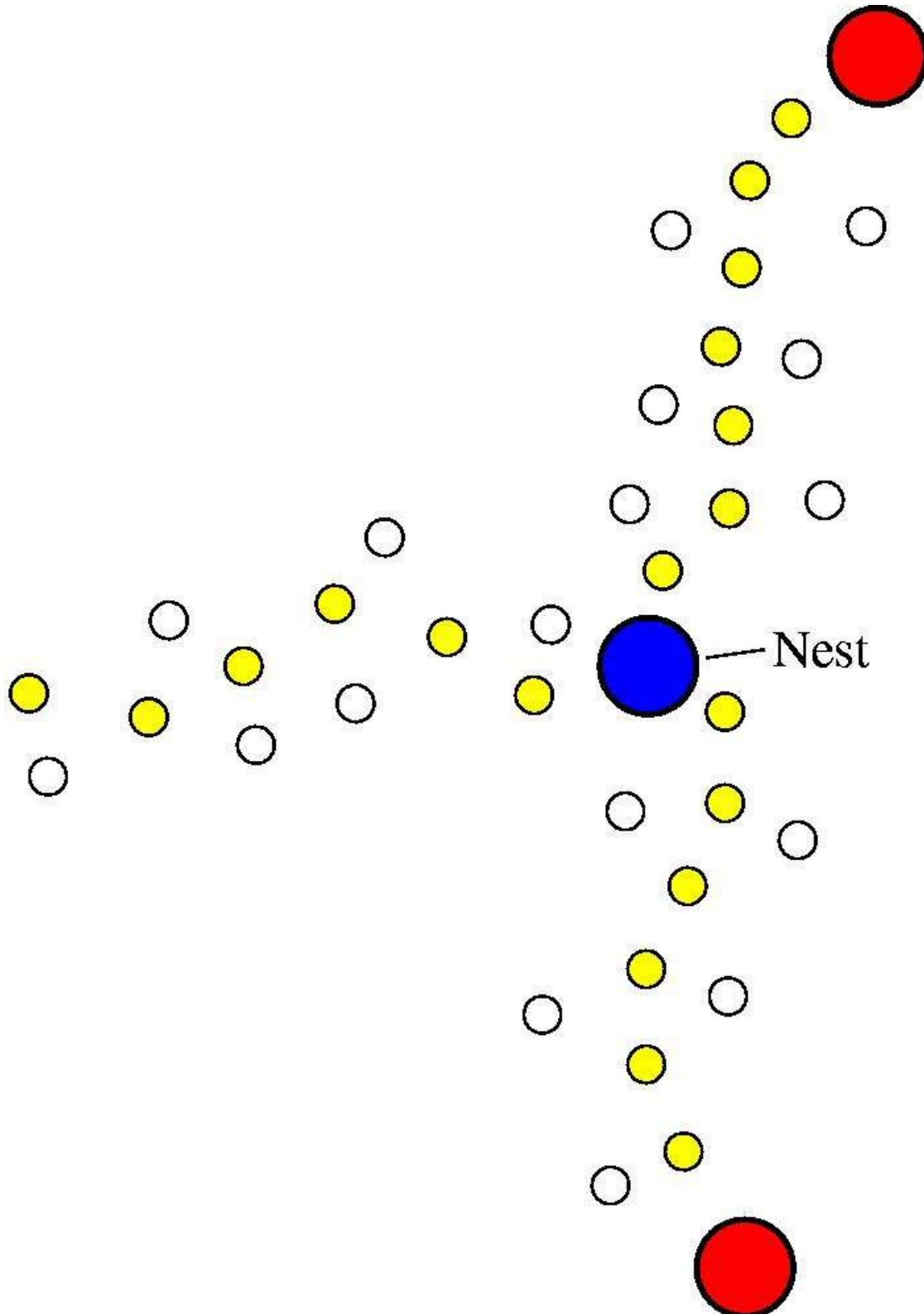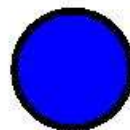
Future works

- Implement gripping and retrieval on twodee

- Some more reading on sensor networks

- "Spreading algorithm" where the robots spread in the environment. Similar to chains, but more random and less structured
  --> Better scalability
  --> Easy to deduce a macroscopic model
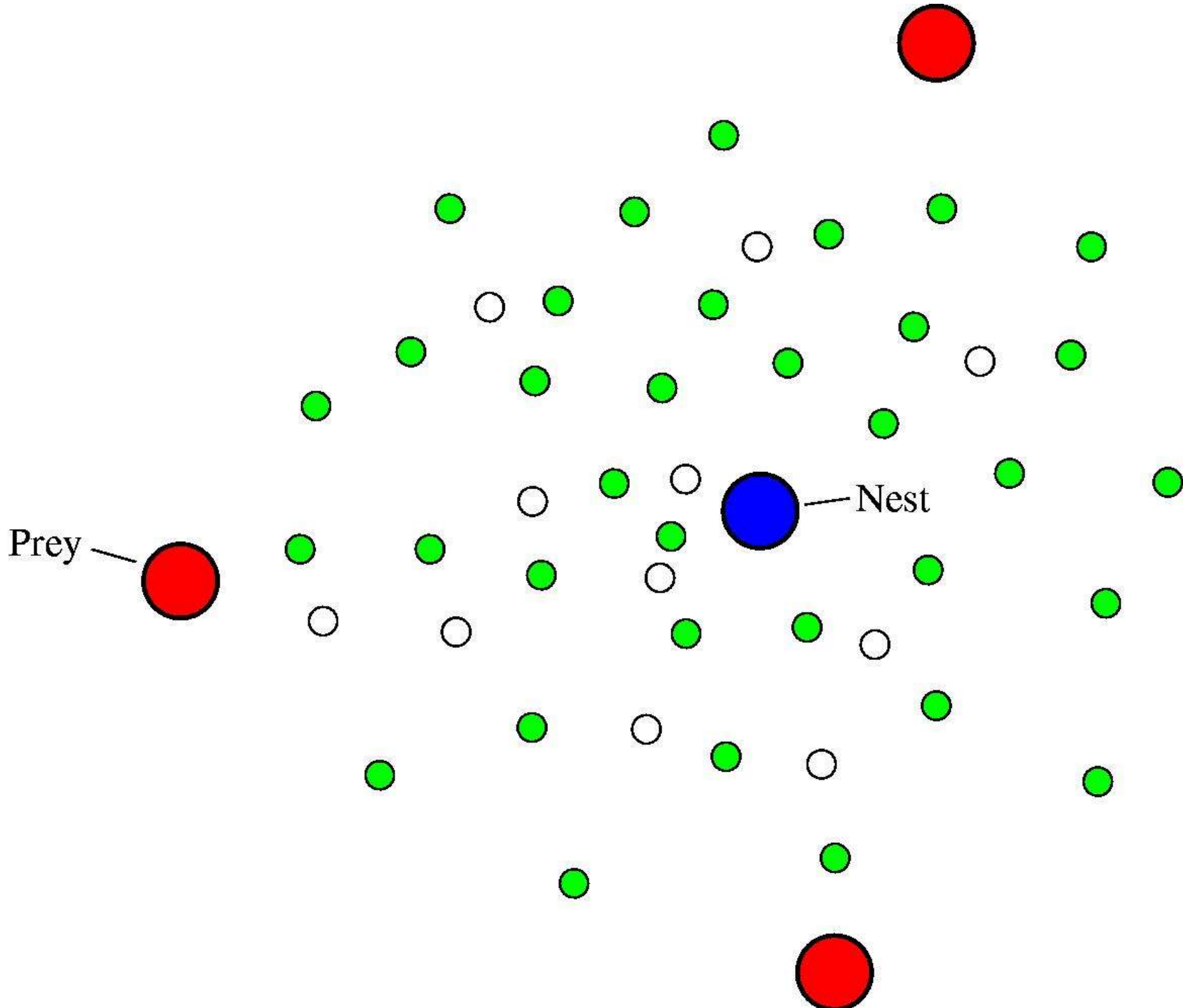
Prey
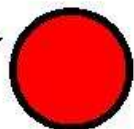
Nest

Prey

Nest

- prey of different weight

- --> task allocation