INFO-H-414 - Swarm Intelligence

Swarm Robotics - Chain Formation Strategy

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Introduction

Controller overview

Controller details

Results

Introduction

Test

Rules

1. If the **nest** has been **left**, and **no** chain beacon have been already **sensed**, after t_{ns} time step, decide with probability p_{btoe} to stop and become a *chain end (E)*.
2. If the **nest** has been **left**, and **exactly one** chain beacon has been **sensed** at a distance greater than d_{chain}, stop and become a *chain end (E)*.
3. If a **chain end (E)** has **more than one** neighboring **beacon**, but **less than three**, then it changes its state to *chain member (M)*.
4. If a **chain member (M)** has **more than two** neighboring **beacons**, then it changes its state to *chain junction (J)*.
5. The chain identifier of a new beacon is determined by incrementing of one unit the chain id of the closest beacon.

Chain example

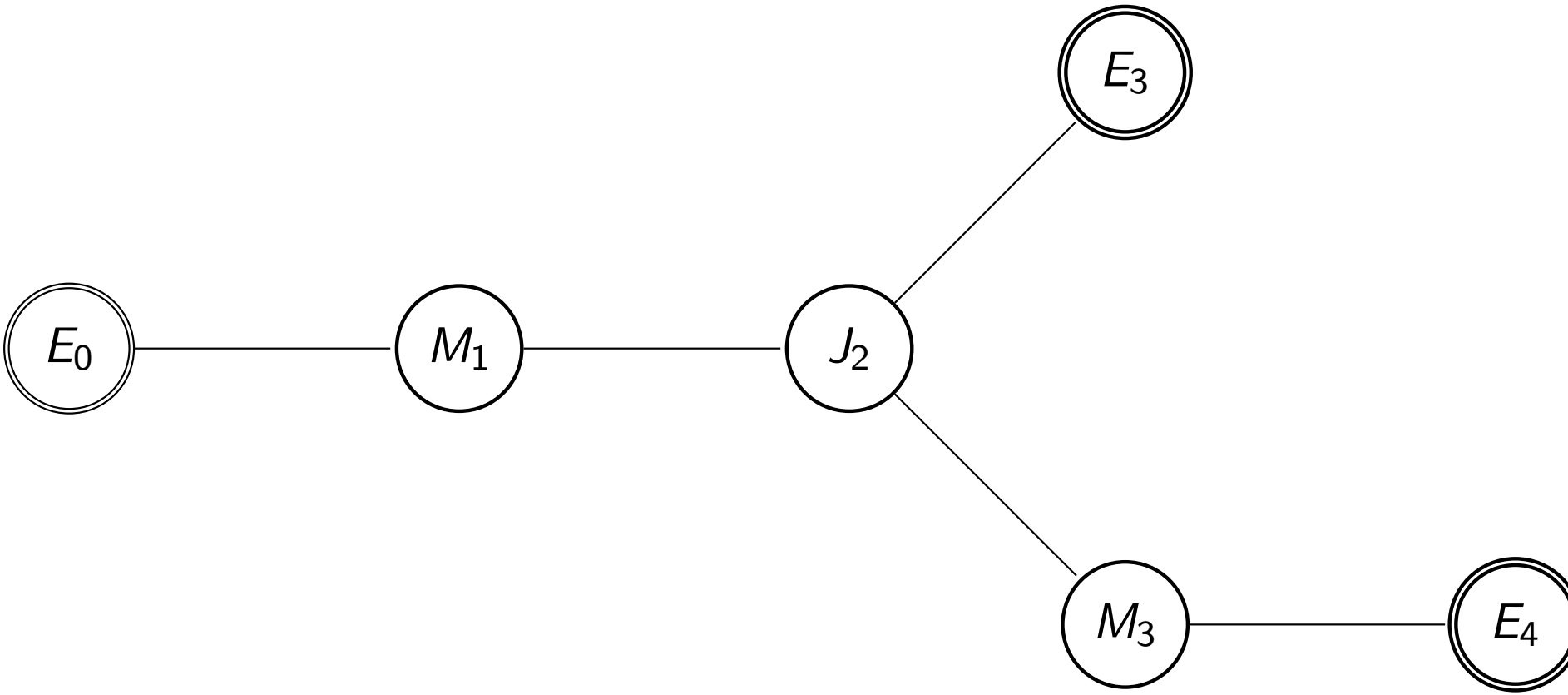
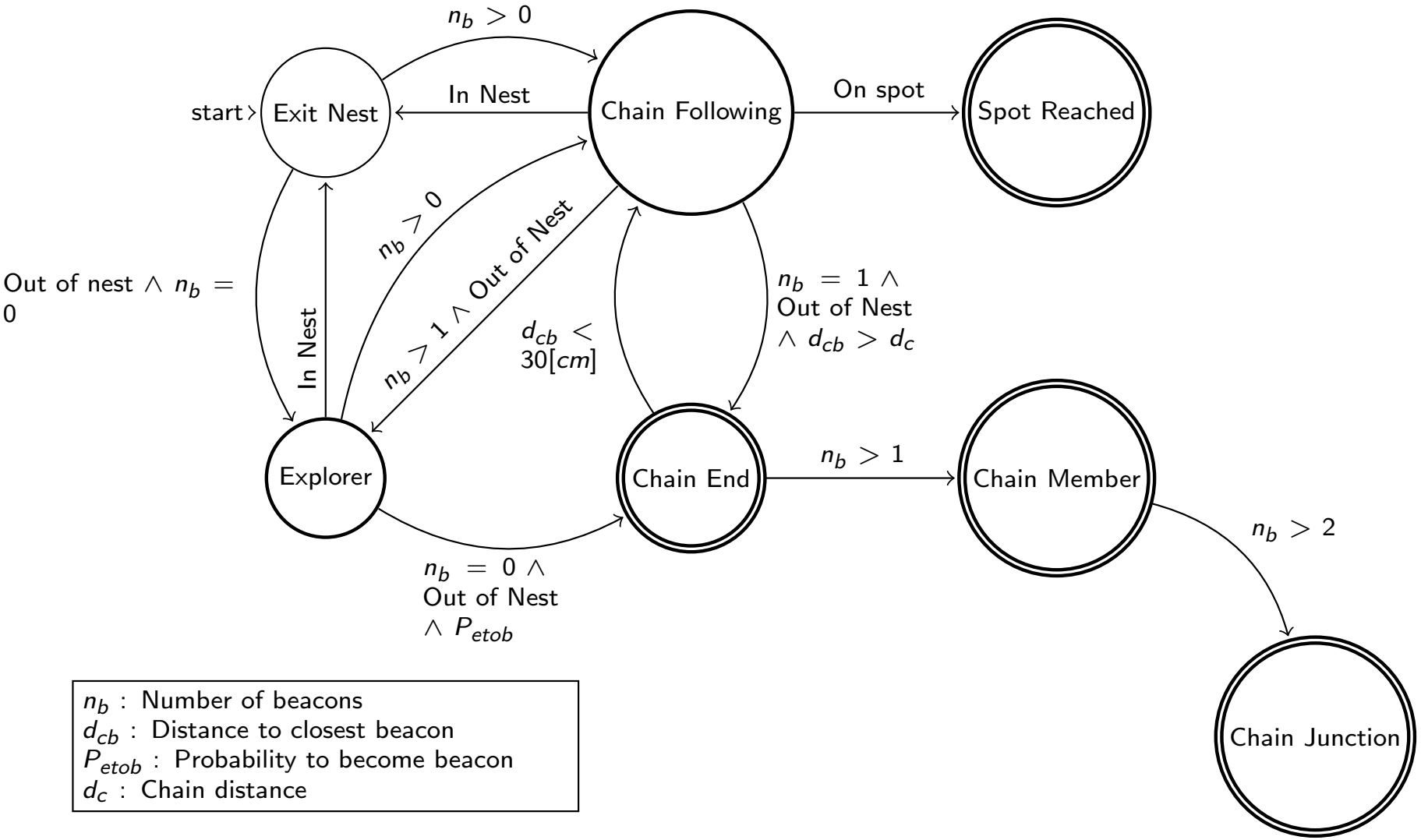


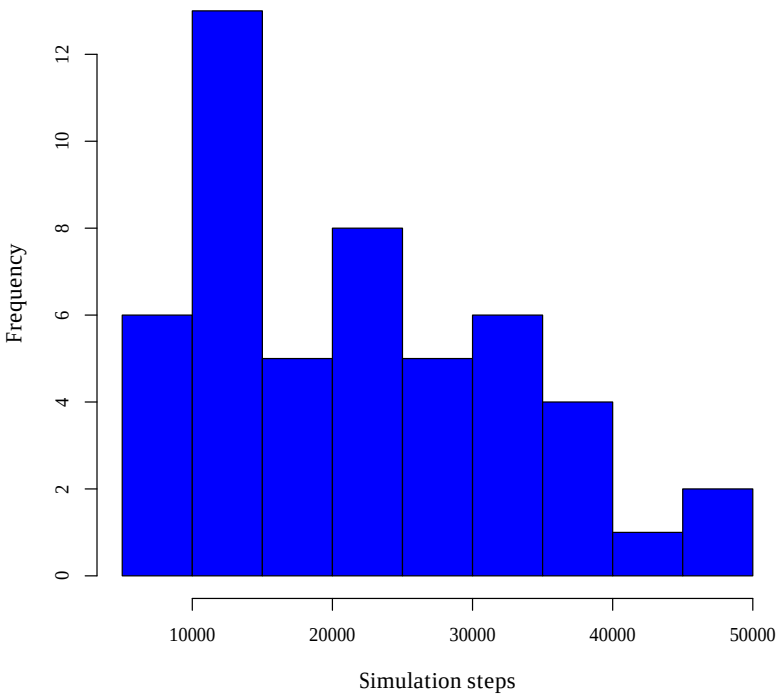
Figure: Chain example with nodes labeling and id

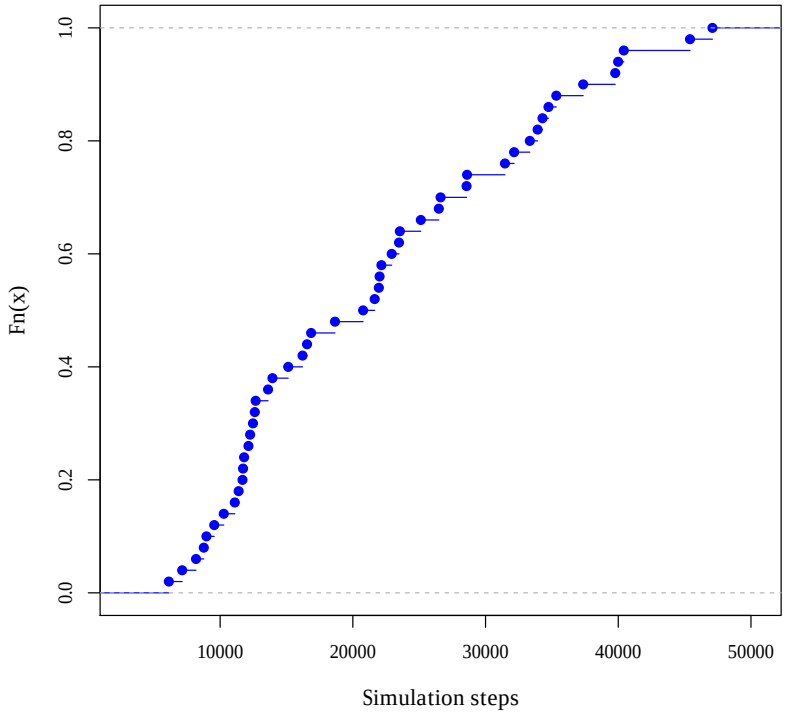
State machine



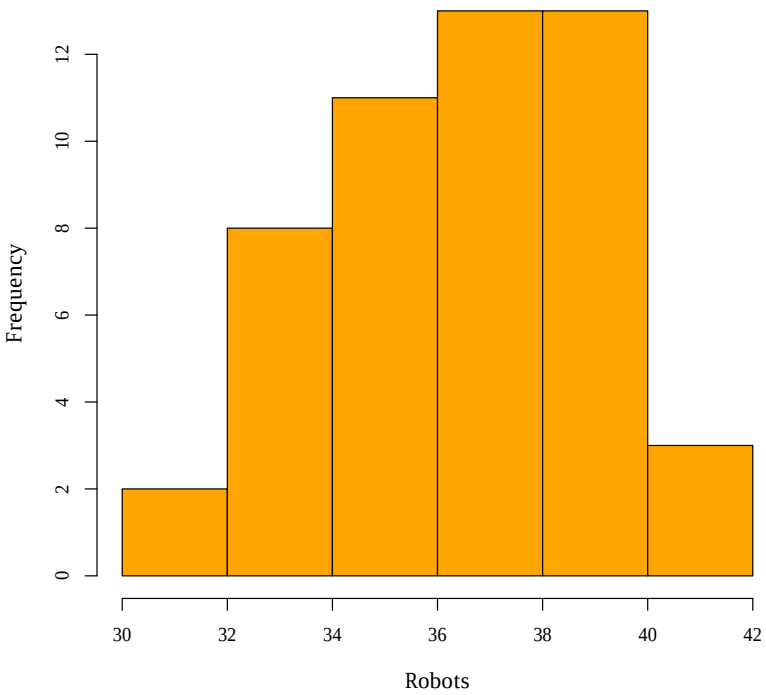
n_b : Number of beacons
d_{cb} : Distance to closest beacon
P_{etob} : Probability to become beacon
d_c : Chain distance

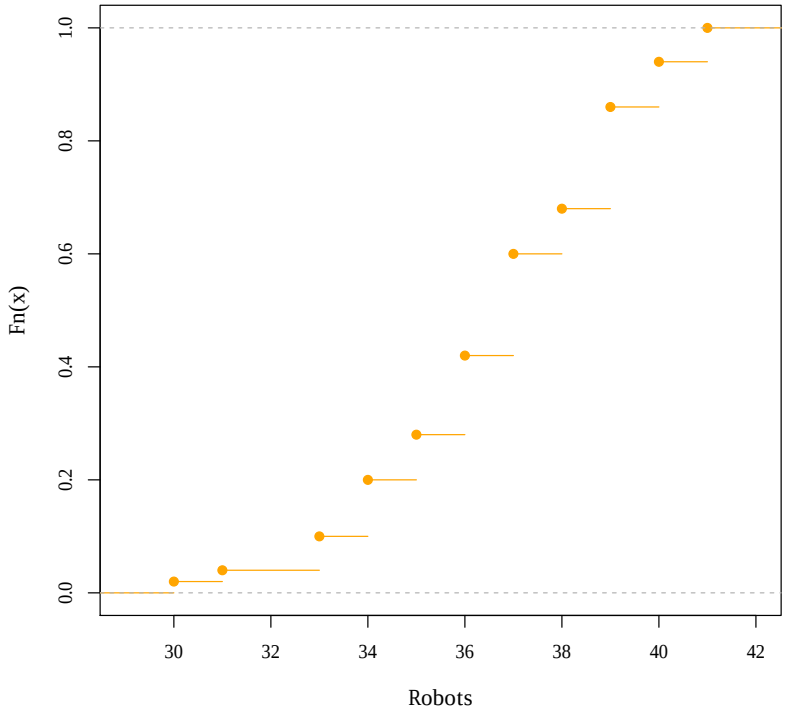
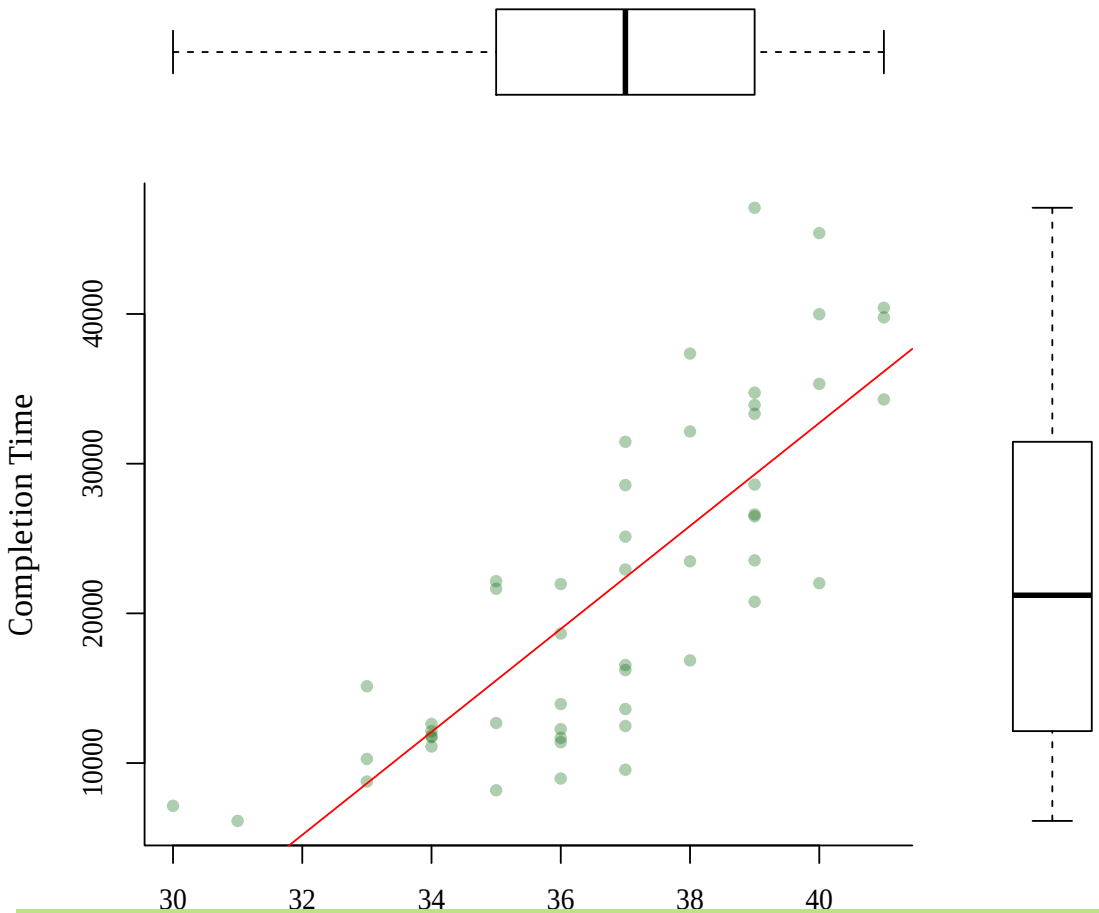
Robots in chain





Completion time





Correlation