

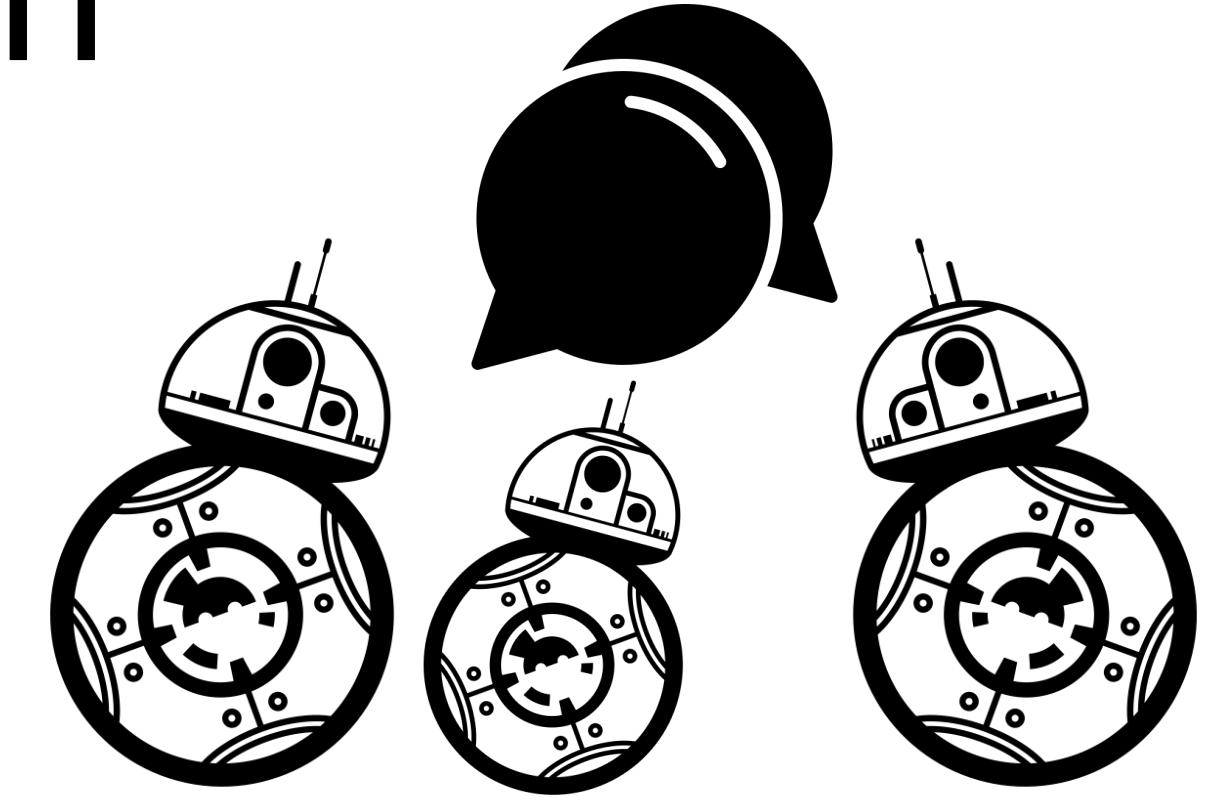
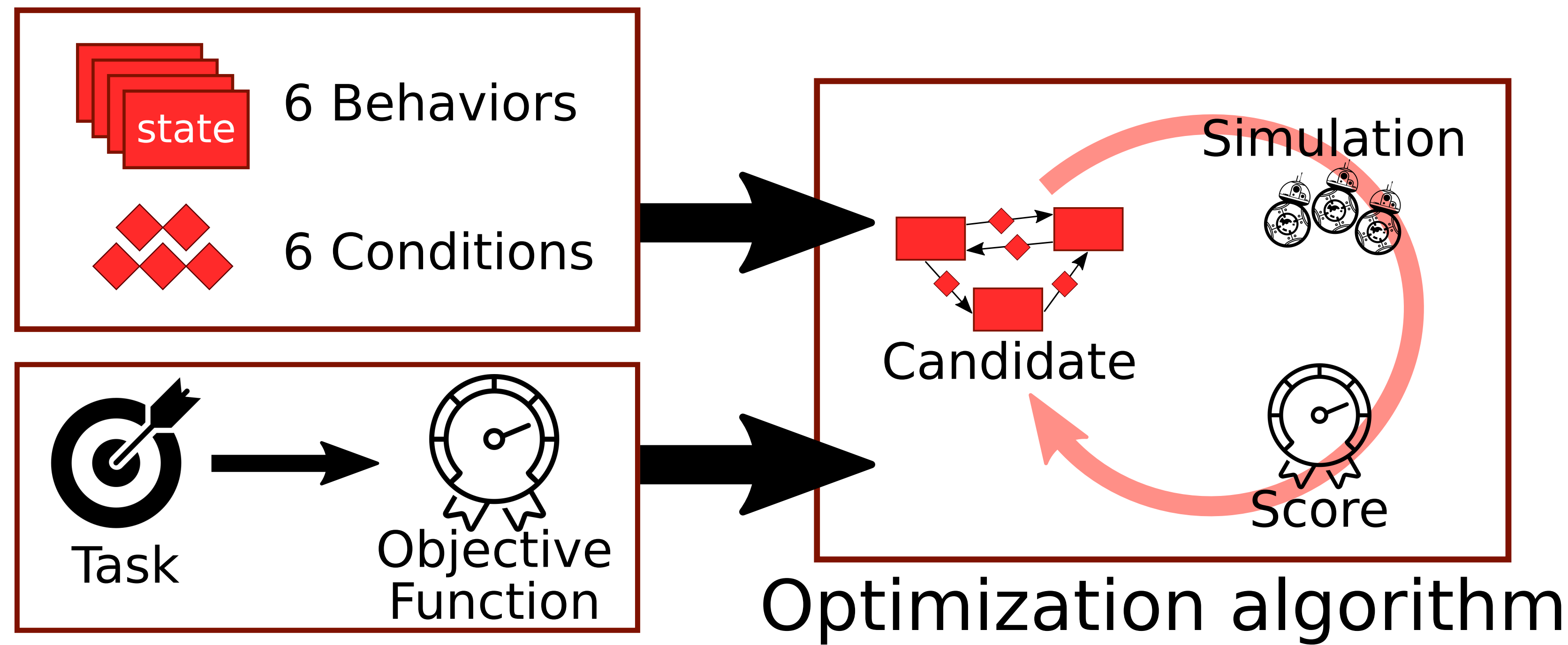
# AutoMoDe-Gianduja:

Automatic design of robot swarms, an experiment on communication

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## Is it possible to automatically design a swarm of communicating robots ?

Our starting point: AutoMoDe-Chocolate



Shall we add/modify modules to automatically design communication ?

### Gianduja: the idea

- Robots may send *one* message
- The automatic design process assigns a specific, task-dependent semantic to the message

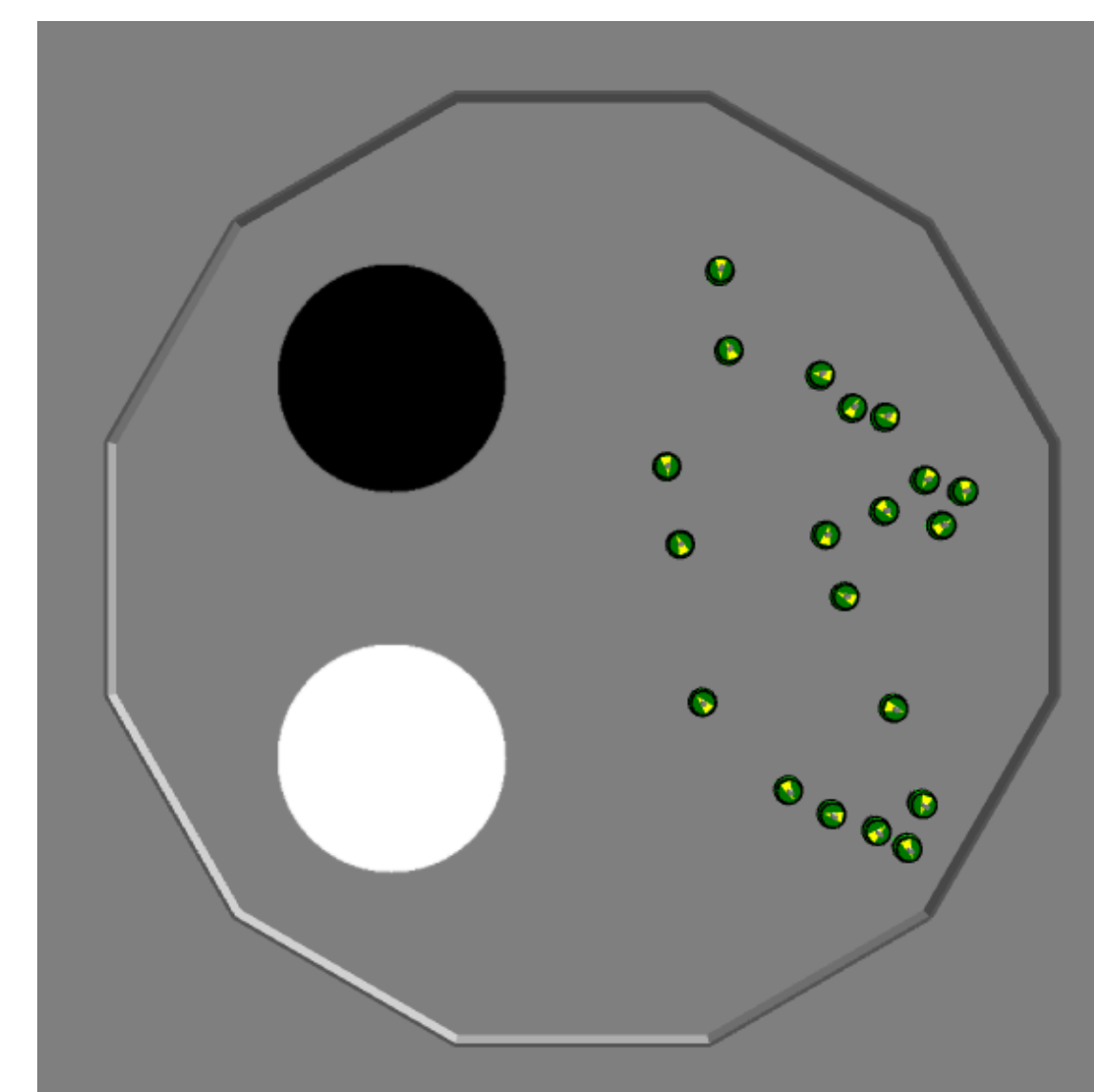
### Gianduja's modules

- Extend Chocolate's behaviors: message flag
- Two new behaviors: attraction to message and repulsion to message
- Two new conditions: message count, inverted message count

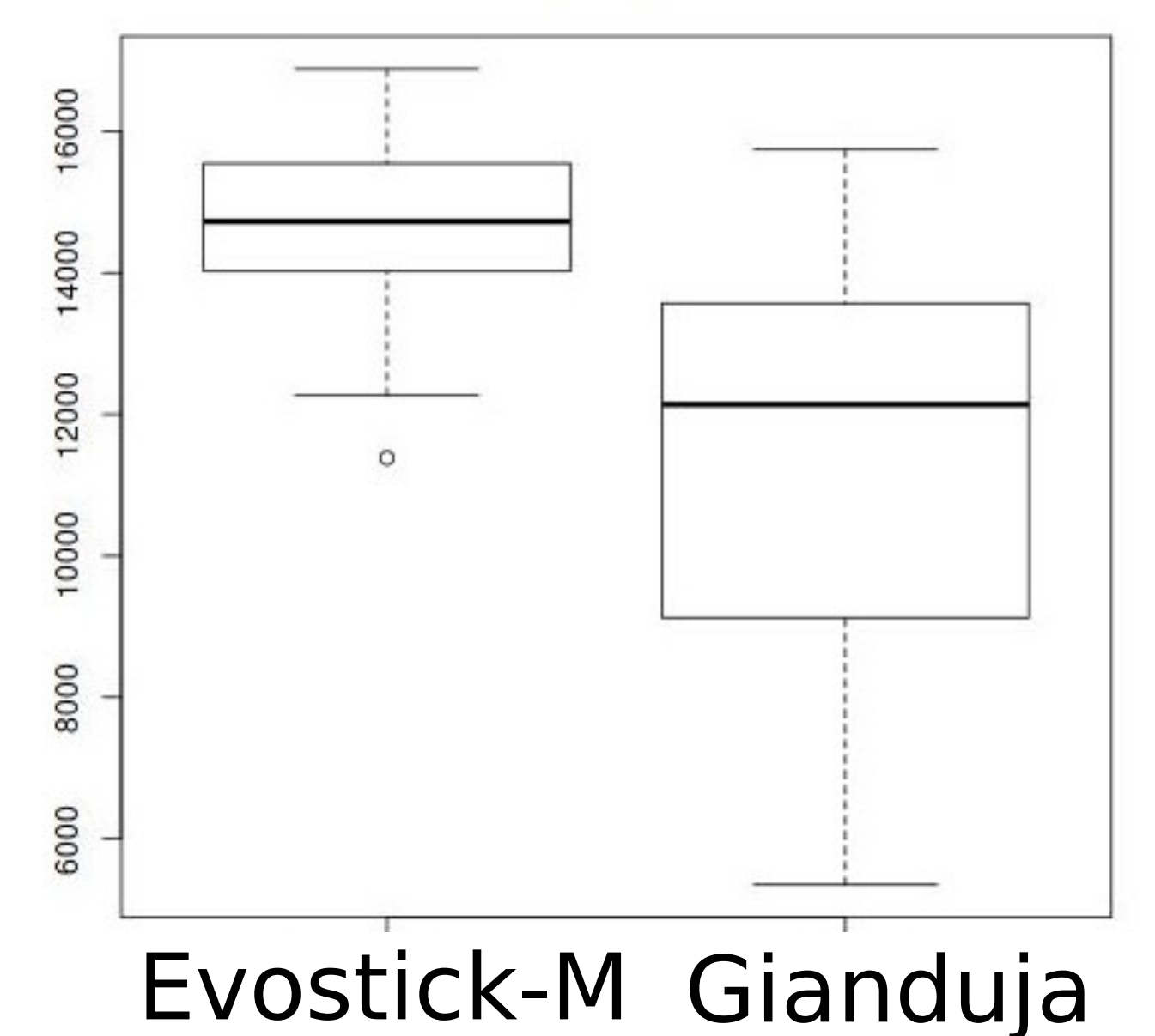
### Experiments

- Three tasks (in which the required semantic is different)
- Gianduja succeeds in giving a semantic to the message for all three tasks
- Gianduja performs better than Evostick-M for 2 out of 3 tasks

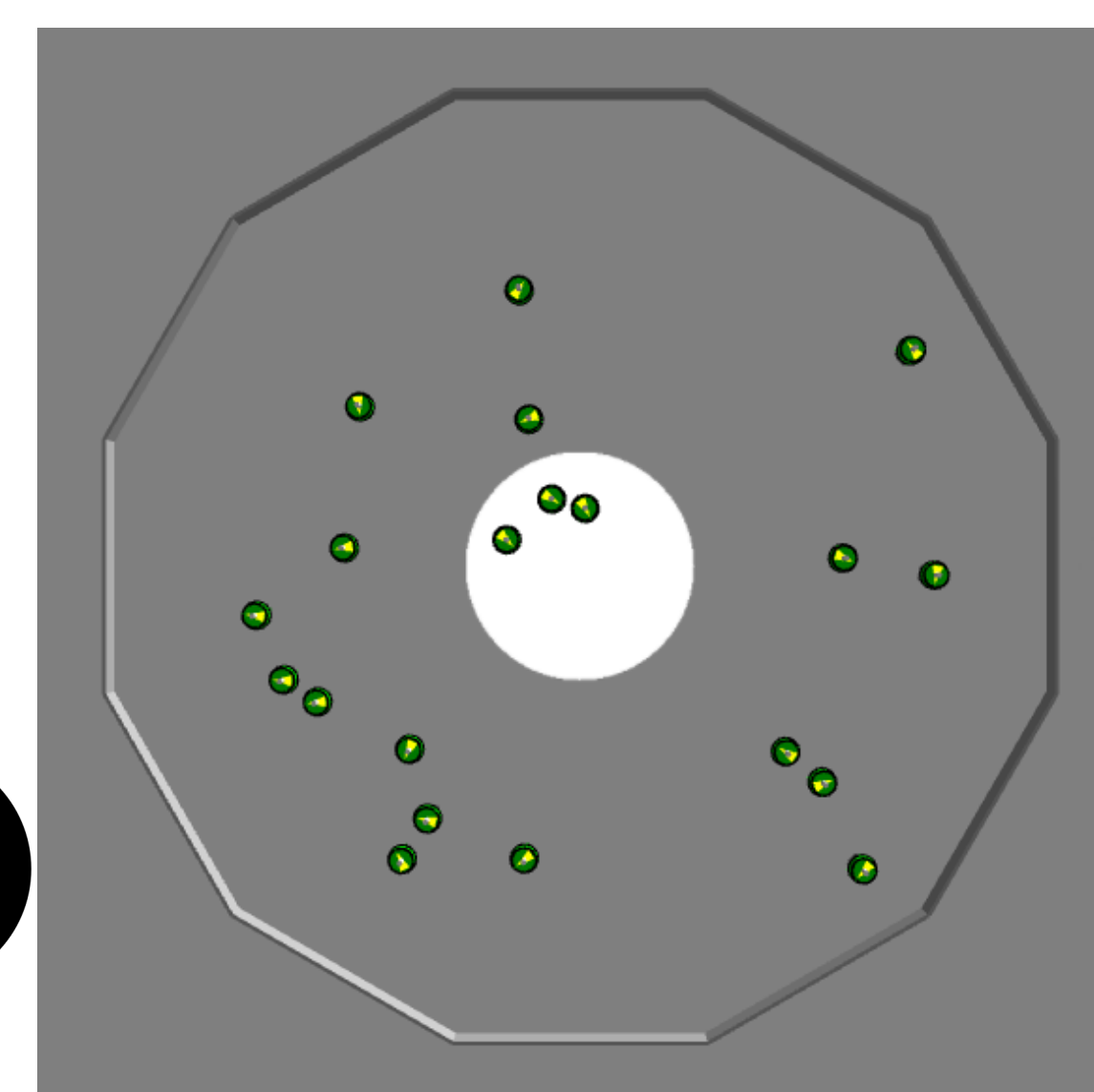
### Tasks and results



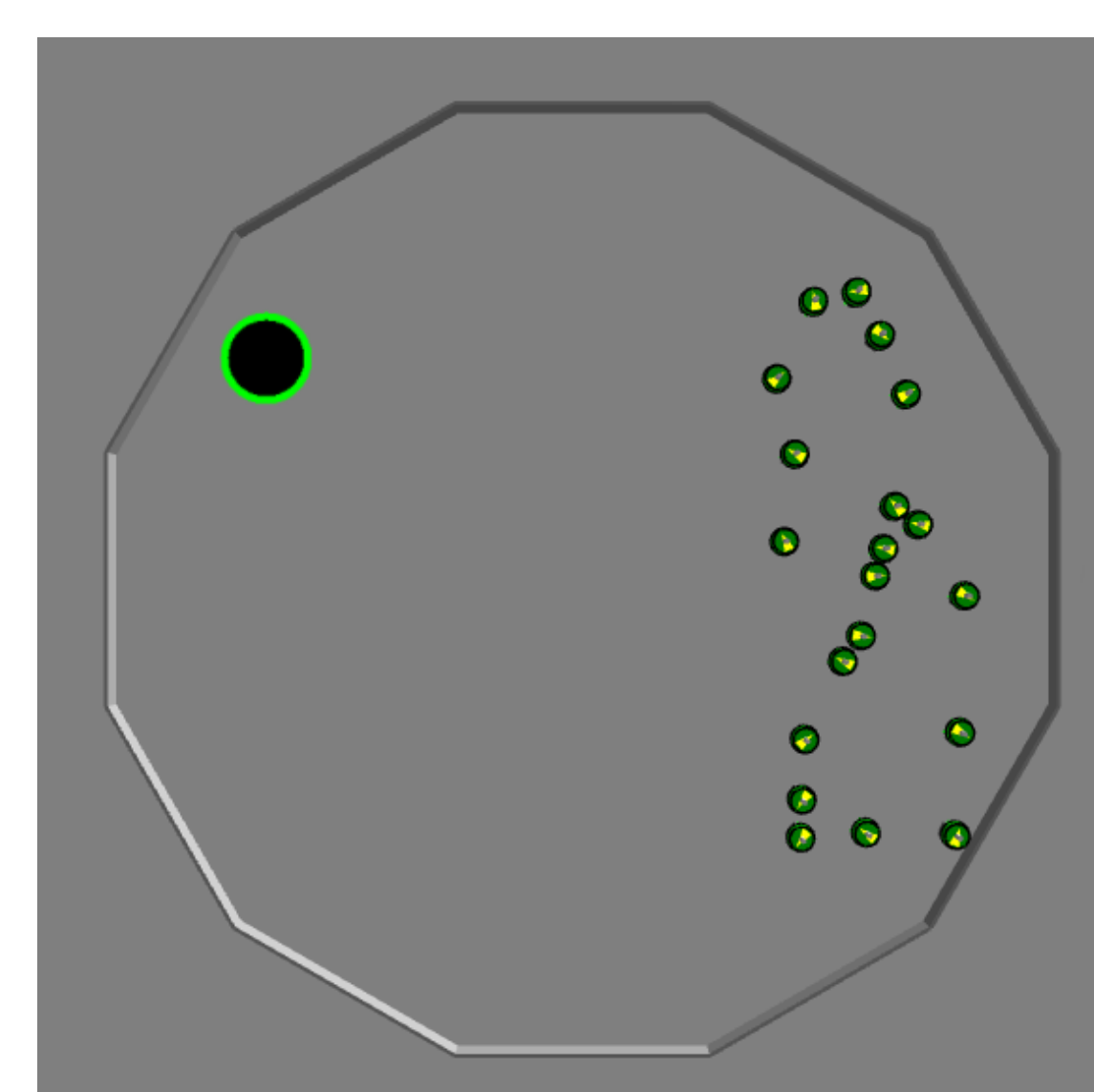
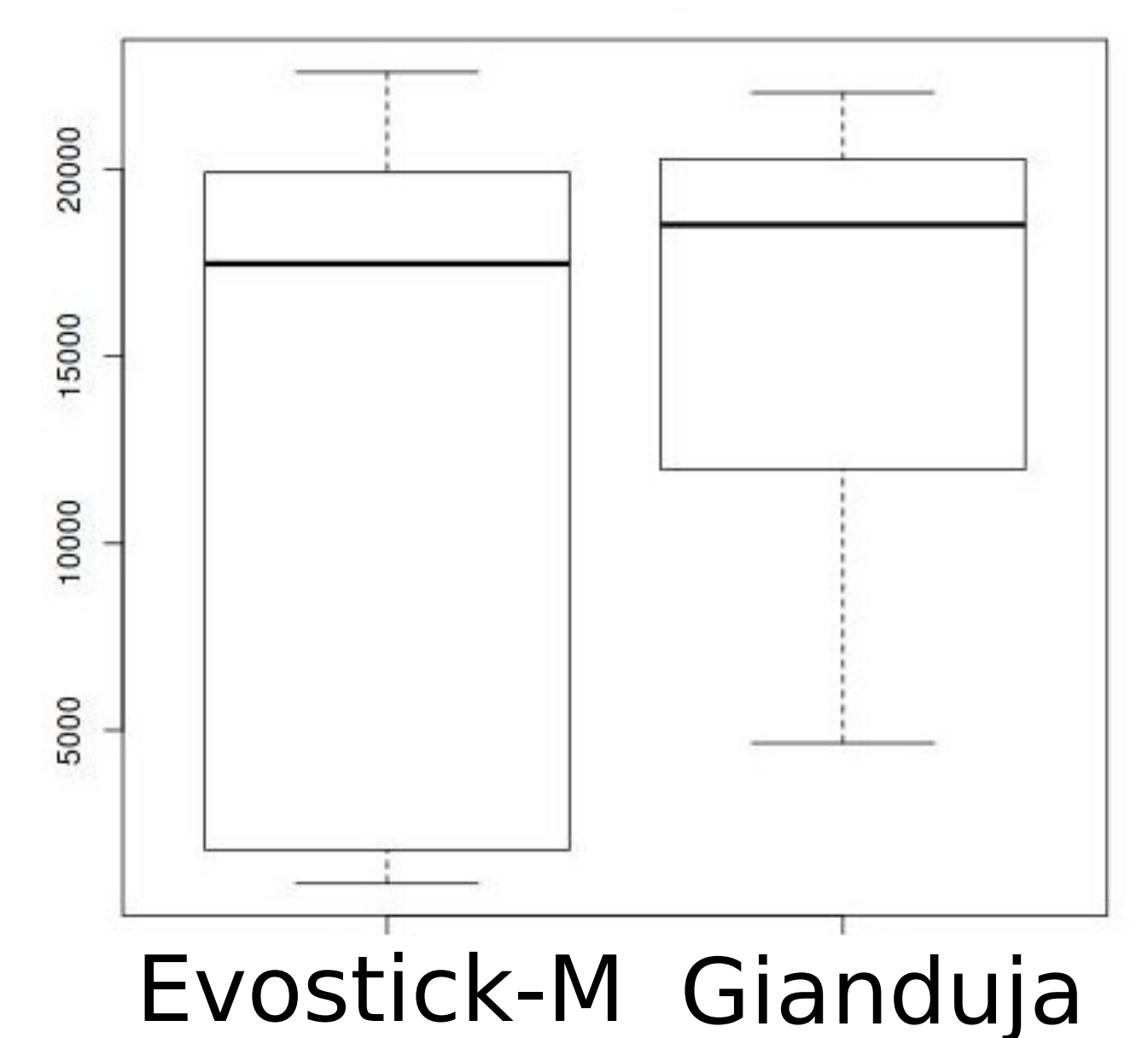
Aggregation



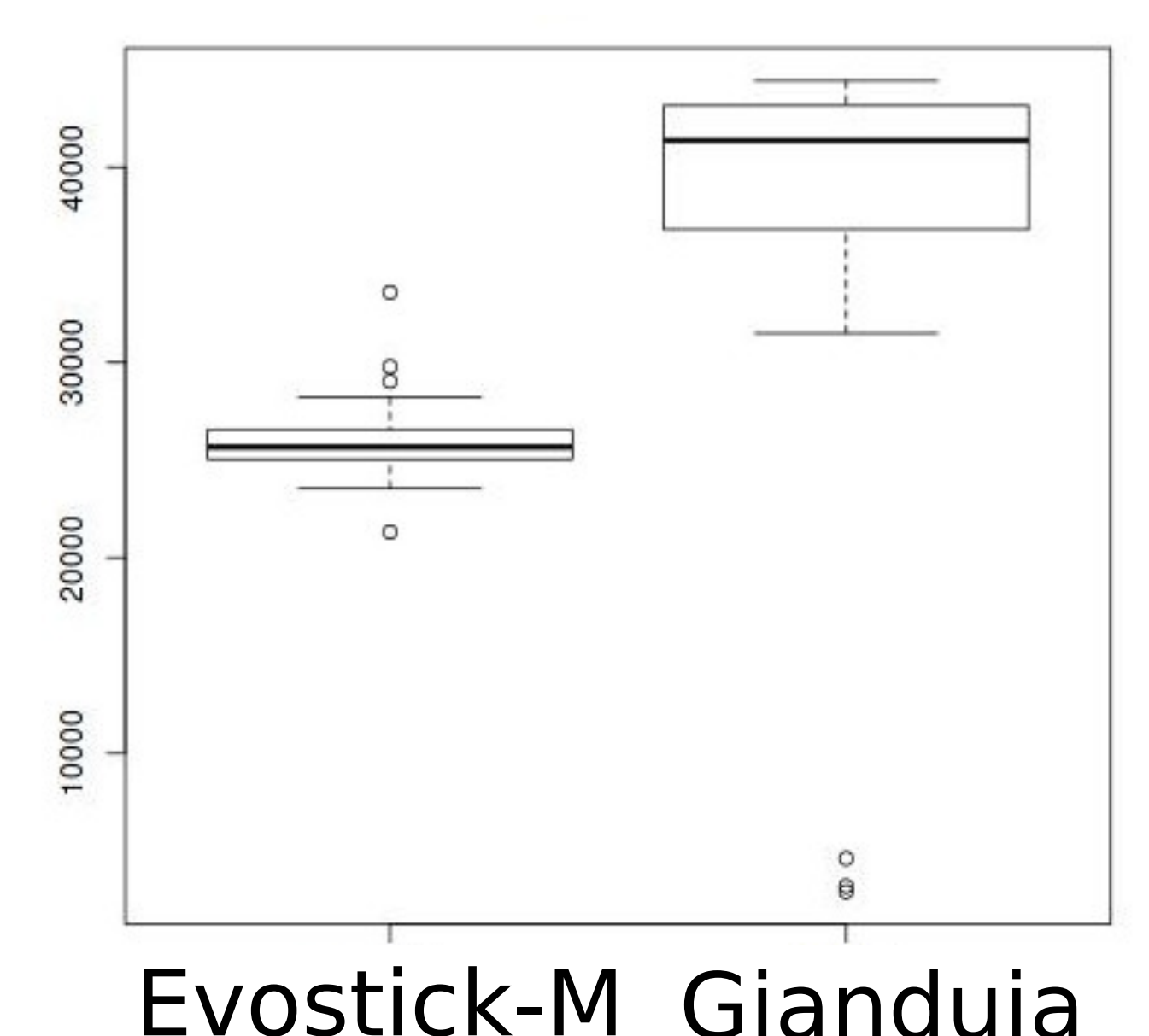
The higher the better ↑



Decision making



Stop



Experimental setting:  
 - 200k simulation budget  
 - e-puck robots  
 - Evostick-M as yardstick (classic evolutionary design method)

