# Multiagent Coordination in Roombas: From a Neural Network Perspective

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*Abstract*—The abstract goes here.

## I. INTRODUCTION

## II. RELATED WORKS

### A. Coordinated Multiagent Reinforcement Learning

[1] ..
[2]
[3]
[4]
[5]

### B. Coordinated Multiagent Neuroevolution

## III. PROBLEM FORMULATION

### A. Structure of Roomba Environment

Add description of Roomba module here...

### B. Multiagent Behaviors

### C. Difficulties and Challenges

## IV. IMPLEMENTATION AND RESULTS

### A. Reinforcement Learning

Add implementation details of Q-Learning and variants here...

### B. Neuroevolution

Add implementation details of Neuroevolution here...

## V. RESULTS

## VI. CONCLUSIONS

The conclusion goes here.
Future Works go here.

## REFERENCES

[1] D. T. Nguyen, W. Yeoh, H. C. Lau, S. Zilberstein, and C. Zhang, "Decentralized multi-agent reinforcement learning in average-reward dynamic dcops," in *Proceedings of the 2014 international conference on Autonomous agents and multi-agent systems*. International Foundation for Autonomous Agents and Multiagent Systems, 2014, pp. 1341–1342.

[2] C. Zhang and V. R. Lesser, "Coordinated multi-agent reinforcement learning in networked distributed pomdps." in *AAAI*, 2011.

[3] C. Zhang and V. Lesser, "Coordinating multi-agent reinforcement learning with limited communication," in *Proceedings of the 2013 international conference on Autonomous agents and multi-agent systems*. International Foundation for Autonomous Agents and Multiagent Systems, 2013, pp. 1101–1108.

[4] B. Banerjee, J. Lyle, L. Kraemer, and R. Yellamraju, "Sample bounded distributed reinforcement learning for decentralized pomdps." in *AAAI*, 2012.

[5] L. Kraemer and B. Banerjee, "Informed initial policies for learning in dec-pomdps." in *AAAI*, 2012.