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| **University of Southern Denmark – Course AM24** |
| Multi-Agent Systems |
| Planet Exploration |
| **Group 3** |
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# Introduction

A project created for the summer course of AM24 – Multi-Agent Systems, using Madkit and Turtlekit.

The project involves multiple agents for planet exploration; ore is harvested from the planet with robots and stored in bases, using explorers to find the ore, and transporters to move the ore to the base. The explorers and transporters have a limited amount of energy available, when energy is almost depleted they return to base to recharge. Energy is consumed by actions; moving, sending messages, perceiving the environment. The explorers have a limited perception scope and can only detect ore that is nearby. Each base has a limited capacity of ore, and each transporter can carry a limited amount of ore.

|  |  |
| --- | --- |
| Base Capacity | C |
| Ore Density | D |
| RobotEnergy | E |
| Grid Size | G |
| Mode | M |
| Number of Bases | N |
| RobotPerceptionScope | P |
| RobotCommunication Scope | I |
| Robot Memory Size | S |
| Max Simulation Time | T |
| Transporter Ore Capacity | W |
| Explorer Amount | X |
| Transporter Amount | Y |

The table show the parameters of the project and the associated symbols which are used throughout the report.

# Design



# Base

# Explorer

# Transporter

# Experiments

|  |  |  |
| --- | --- | --- |
| Base Capacity | C | 200 |
| Ore Density | D | 0.05 Uniform distribution |
| RobotEnergy | E | 5000 |
| Grid Size | G | 200x200 |
| Mode | M | Cooperative |
| Number of Bases | N | 1 |
| RobotPerceptionScope | P | 5x5 |
| RobotCommunication Scope | I | 11x11 |
| Robot Memory Size | S | 15 |
| Max Simulation Time | T | 10000 |
| Transporter Ore Capacity | W | 8 |
| Explorer Amount | X | 10 |
| Transporter Amount | Y | 10 |

# Discussion and Further Development

# Conclusion

# Appendix