Note: The black color is used for sections and subsections and blue is for the content.

**Abstract**

* **School and robotic**

**Contents**

**Introduction**

The text from the original thesis proposal

**Background**

* Collaboration problems
* Evoltion as a solution (Group selection)
* Implementation of the collaboration (with its problems) and evolution as a solution using AI (MABE)

**Purpose**

* Original text from the proposal
* Research gap (minimum and maximum)

**Literature review**

Only the AI articles

**Material and Methods**

**Experiments**

Here we should talk about the MABE and how we modified and used (in making the world) it to do the experiments. This part will have several sections.

**Data description**

LOD.csv

Movement.csv

Beep.csv

**Methods**

Lod Analyzer

Movement Analyzer

Beep Analyzer

**Results**

**Score variations through generations (Based on LOD files)**

**Overall score statistics (Based on LOD files)**

**Clone versus not clone statistics (Based on LOD files)**

**Behavioral statistics (Based on movement files)**

**Beep versus mute statistics (based on beep files)**

**Discussion**

* Clone and minimum is the best (as the research aim)
* High variance of performance during evolution correlates with high performance in the end
* Clones follow the rewarding scheme better
* Beeping helps those groups who have to organize their behavior (actions)

**Conclusions**

* the thesis aim is satisfied
* beyond the initial thesis aim
* future works

**References**