

# TER : Report

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## 1 Introduction

This project complete developement projet. The aim is to understand, formalise, analyse, and meet software needs in terms of data structures, algorithms, decision support, or even artificial intelligence.

We will introduce our two IAs.

## 2 Game version

We use the last tag (FINAL) but we removed few things in our code : for example Spring, the plots objectives are no longer in this version of the game, we also removed PlotBot.

Finally, we removed irrigation channel in all the game and actually plots are automatically irrigated.

## 3 Guaranteed AI

Our IA is called IANormale.

### 3.1 Functions

- **ChoixDeplacementJardinier :**  
This function move the gardener to the most valuable destination. The best destination for the gardener is two neighbouring plots with the same colour (this strategy is efficient if the opponent tries to collect that we just grew up).
- **ChoixDeplacementPanda :**  
This function move the panda to its new desination. It take as an argument an array list of the possible destinations for the panda, then it do a search to find either a plot with same colour as our objective or a transition plot if we can't reach the desired plot with one move.

- **choixParcellePioche :**  
This function return the plot with the most represented colour in our objectives.
- **choixCoordonnePoseParcelle :**  
This function tells us where we should put the picked plot, it try to put it next to a plot with the same colour.
- **choixTypeAction :**  
This function selects what our IA should do depending on its objectives, the plots, the state of the field and some other conditions written in the specification.  
The conditions are ordered according to a permutation depending on the opponent .

## 4 How our Guaranteed AI performs?

We tested our AI against bots and itself to see the victory ratio.

### 4.1 Guaranteed AI vs Random

When our AI plays against the random bot, our AI has a number of victory of 1000.

### 4.2 Guaranteed AI vs Bots

There are two types of bot : the gardener bot and the panda one.

Against the gardener bot (the bot which is trying to complete its gardener objectives) our AI wins with a number of victory of 1000.

Against the panda bot (the bot which is trying to complete its panda objectives) our AI wins with a number of victory of 993.

### 4.3 Guaranteed AI vs AI

When our AI compete with itself, our AI wins with a number of victory of 663 (because we have chosen a better order by using a different permutation).

## 5 Ambitious AI

Ambitious AI is an improved version of the original AI (IANormale) which is using the fact that it can see the different objectives of its opponent; knowing that our AI can evaluate the situation and choose the best option (for example: letting the opponent grow sections of bamboos in order to complete our objectives ,collecting a great number of bamboos that will be used in the end of the game ... etc ).This AI has two strategies depending on how the opponent

plays (a strategy against an adversary who focus on doing panda objectives and another one against an adversary who focus on doing gardener objectives). Unfortunately, we haven't finished the ambitious AI, we have begun doing the panda strategy.

## **6 How our Ambitious AI performs?**

Our unfinished Ambitious AI wins 96% of the games against the panda bot. Since we didn't finish the AI, we don't have the stats against the other bots.

## **7 Conclusion**

For the guaranteed IA, the results fits our expectation, our AI has a high win rate against all the others. For the ambitious AI, we cannot discuss about its efficiency but we think that it's "in theory" smarter than guaranteed one.