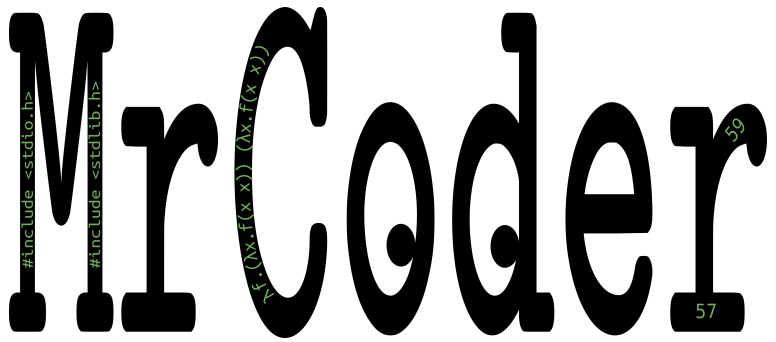
Yolah Board Game

Building a Two-Player Perfect-Information Game with AI Players

Pascal Garcia

November 18, 2025


MrCoder
#include <stdio.h>
#include <stdlib.h>
λf.(λx.f(x x)) (λx.f(x x))
59
57

C’est en forgeant qu’on devient forgeron

À Sarah, Hugo et Célya ❤

Contents

1 Introduction **1**
- 1.1 The Yolah Game . . . 1
  - 1.1.1 Game Rules . . . 2
  - 1.1.2 Interesting Characteristics of Yolah for Developing AIs . . . 2
  - 1.1.3 Game Example . . . 2
  - 1.1.4 What's Next . . . 2

2 Game Engine **3**

3 AI Players **5**

4 Monte Carlo Player **7**

5 MCTS Player **9**

6 Minmax Player **11**

7 Minmax with Neural Network Player **13**

8 AI Tournament **15**

9 Conclusion **17**

List of Figures

1.1 The box of the penguin game 1

List of Tables

Chapter 1

Introduction

1.1 The Yolah Game

I created the Yolah game to illustrate effective techniques for implementing board games and artificial intelligences for my students. I was inspired by the penguin game, whose box you can see in Figure 1.1 (I highly recommend it ☺)

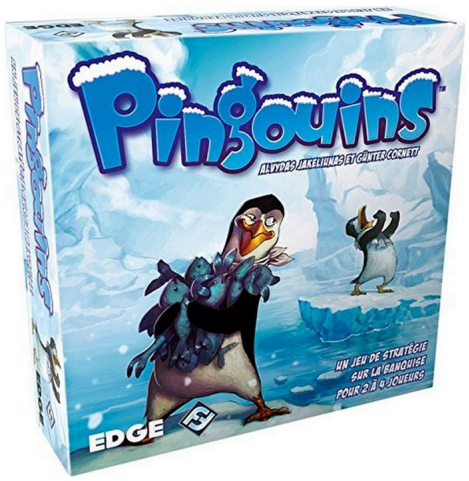


Figure 1.1: The box of the penguin game

Important

I have done my best with my current knowledge (*ars longa, vita brevis*) to implement my game and the associated AIs. But like any good scientist, you should look at my work with a critical eye. I wrote the book in French (easier for me) and asked an AI assistant (Claude [**anthropic2025claude**]) to translate it for me.

I will now describe the rules of the game, then I will explain why I chose these rules, I will give an example of a game between two AIs and then I will present the rest of the book.

1.1.1 Game Rules

1.1.2 Interesting Characteristics of Yolah for Developing AIs

1.1.3 Game Example

1.1.4 What's Next

Chapter 2

Game Engine

Chapter 3

AI Players

Chapter 4

Monte Carlo Player

Chapter 5

MCTS Player

Chapter 6

Minmax Player

Chapter 7

Minmax with Neural Network Player

Chapter 8

AI Tournament

Chapter 9

Conclusion