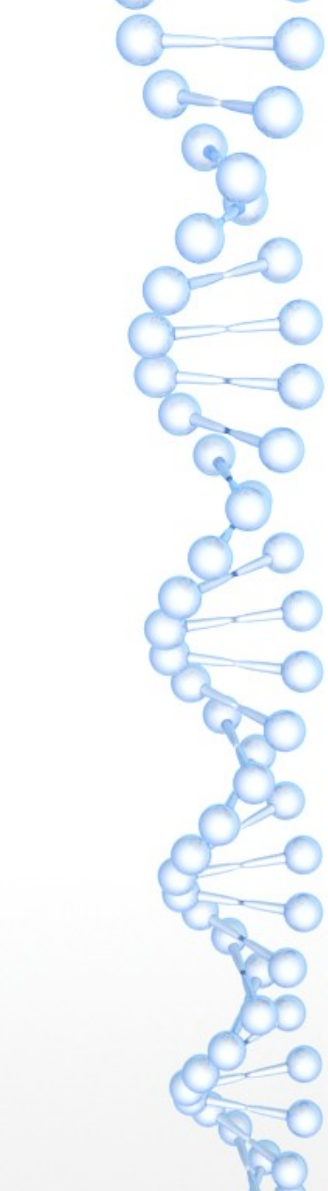

Artificial Intelligence learns to play „The World's Hardest Game" using genetic algorithms

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SSI Sem. VI

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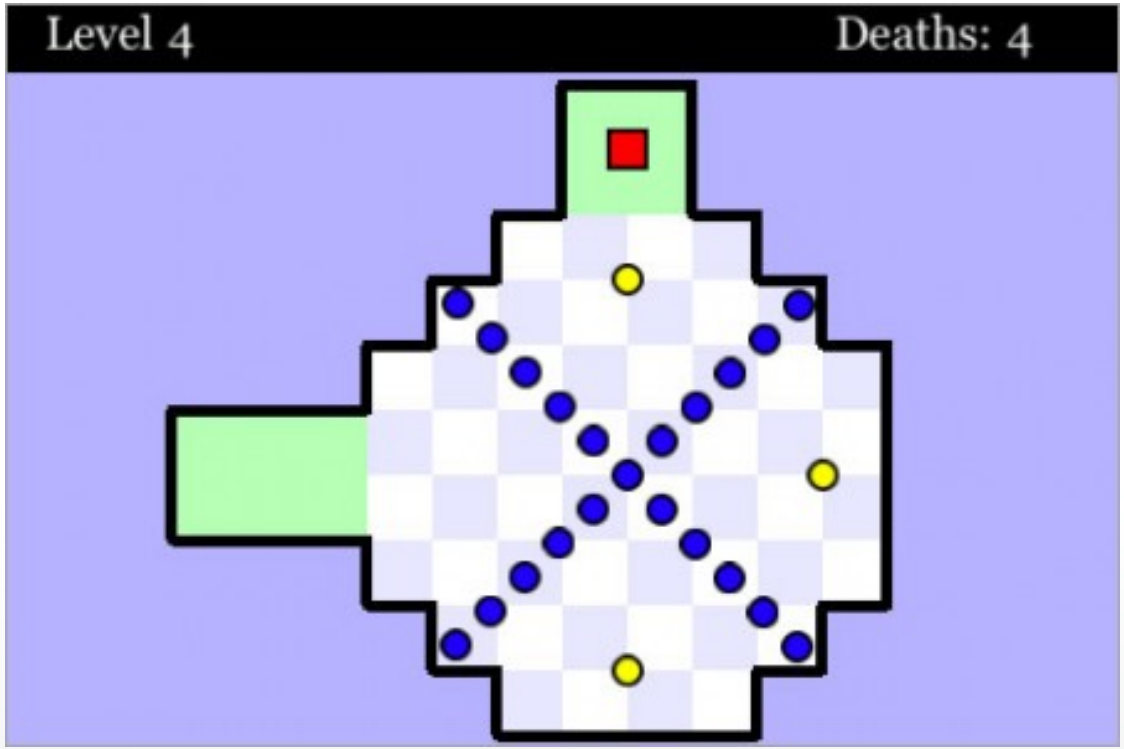
Game description

The World's Hardest Game is a game that involves moving from area A to area B, collecting points in form of coins.

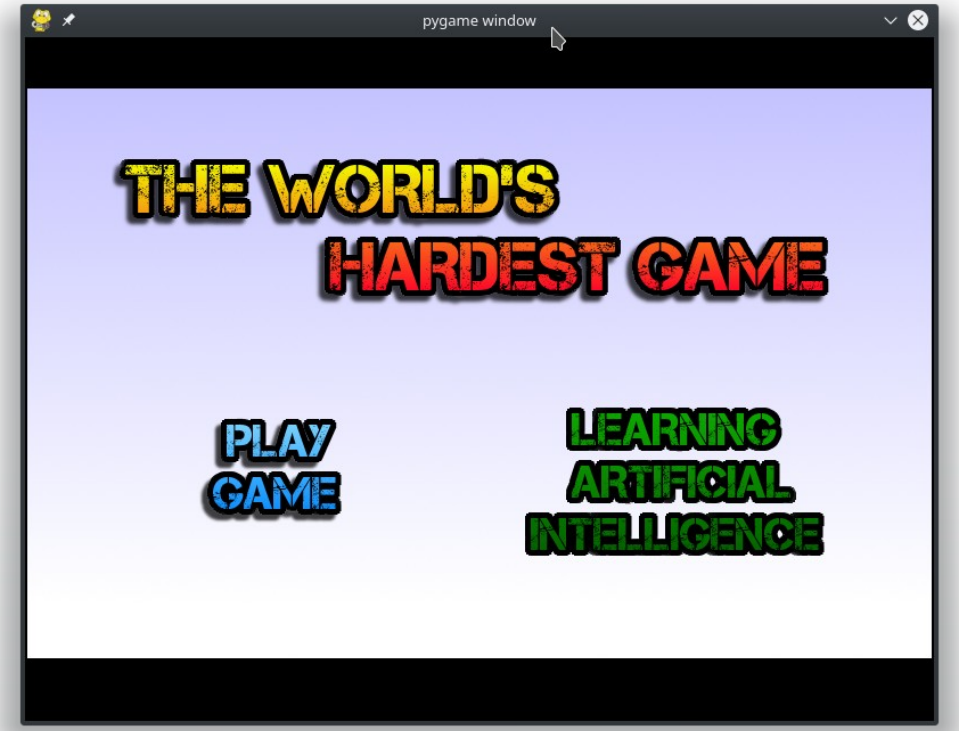


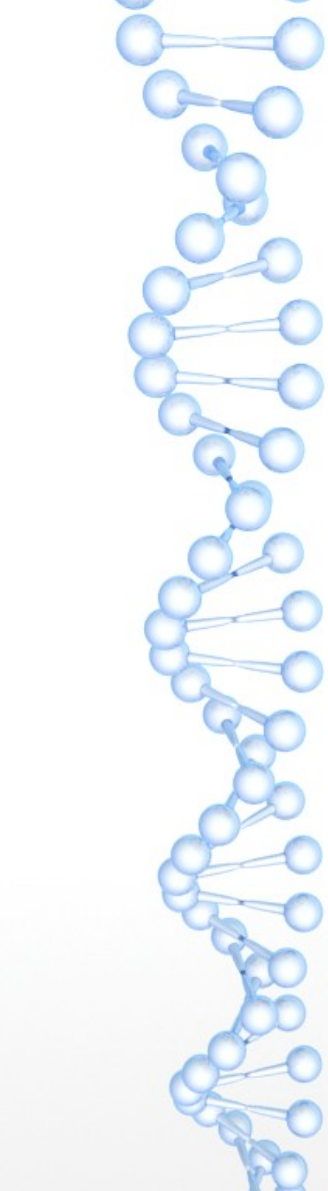
Used technologies

- the game will be written in Python
- the Pygame library based on the C ++ SDL library will be used

Functions

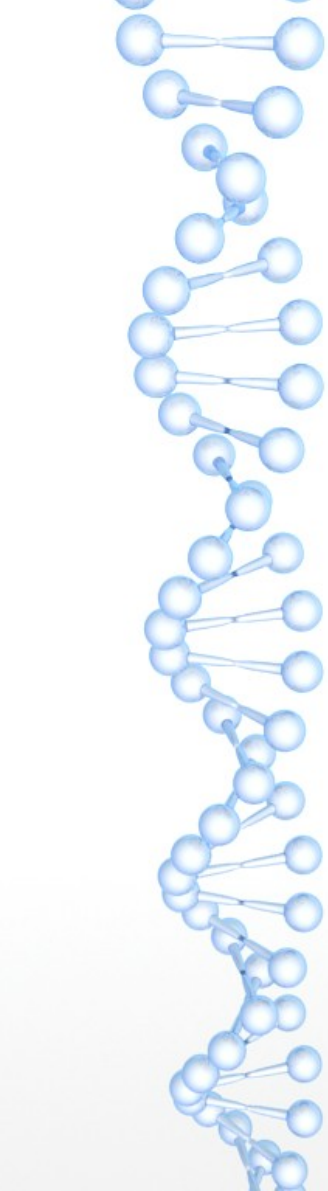
The game will provide two functionalities. The first one will let you play the game yourself and the second one that uses artificial intelligence to go through the game and learn on the way.

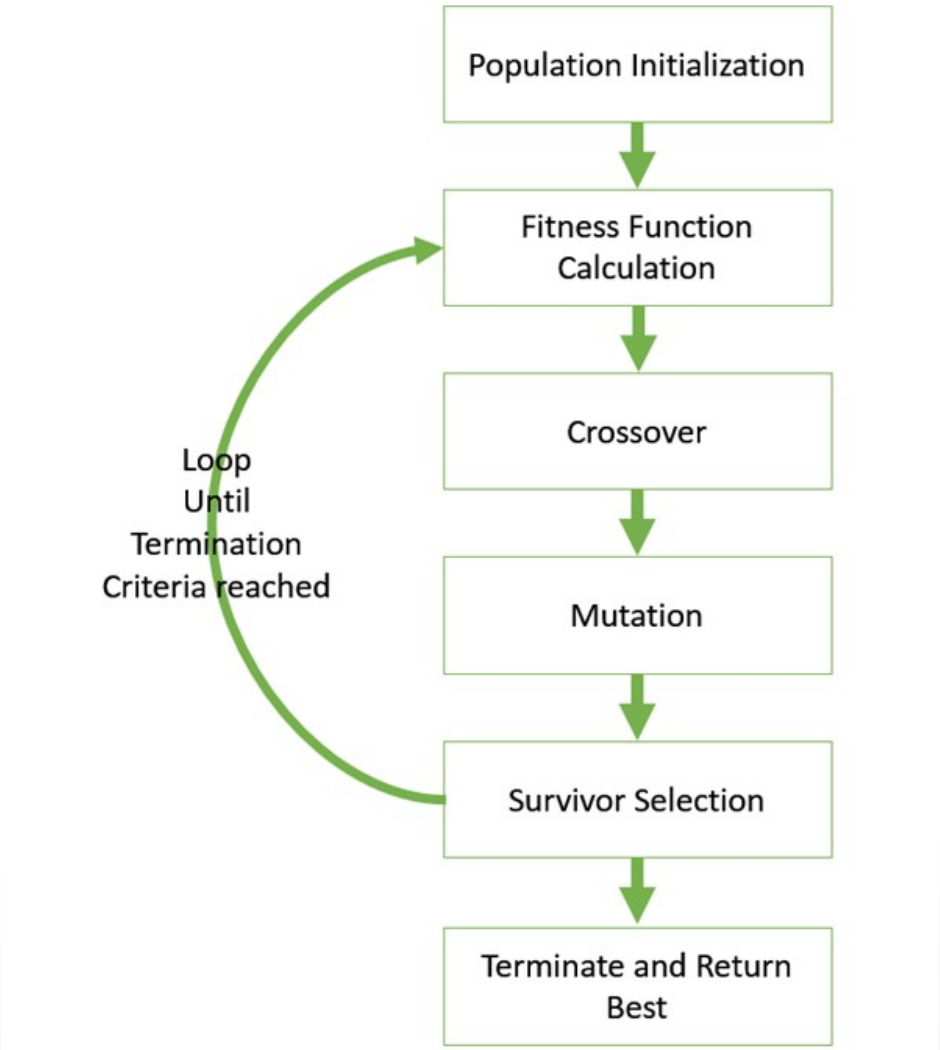


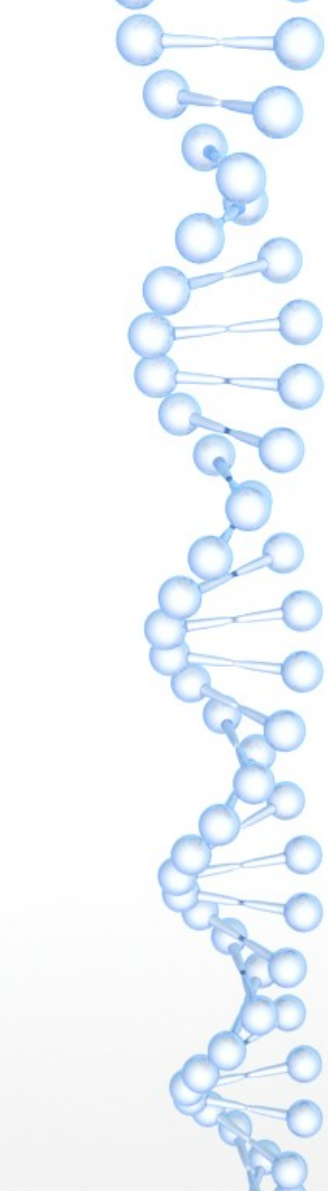


Genetic algorithm

Algorithm will create random population. Each individual will have his genotype, i.e. a certain set of information. On the basis of the genotype, a phenotype will be created, i.e. a set of features that will be analyzed by the fitness function. This function will decide how given individual is fit to became a bese for next generation. And on the basis of this assessment the best specimen will be reproduced.




Population Initialization
Fitness Function Calculation
Crossover
Mutation
Survivor Selection
Terminate and Return Best
Loop Until Termination Criteria reached

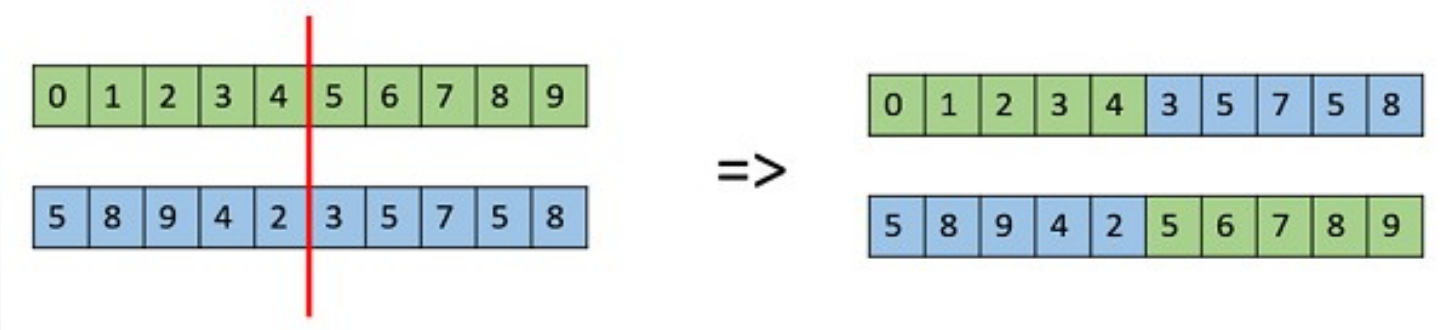


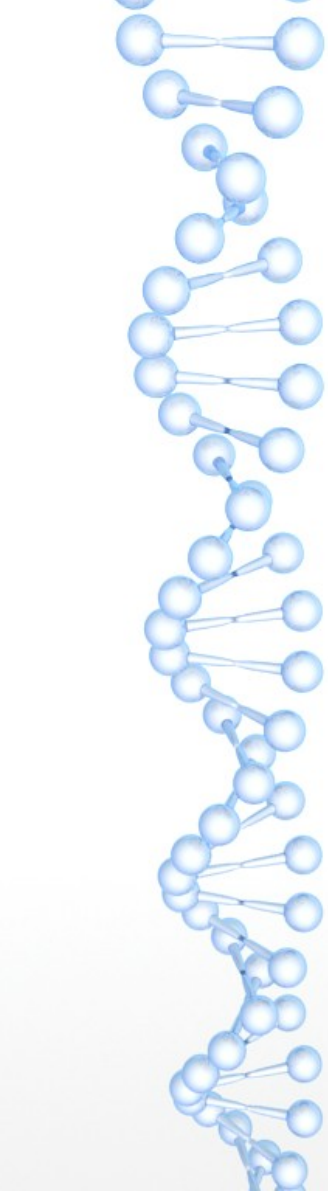
The meaning of terms in our game

- chromosome - a single instance of a player object
- population - a large number of these individuals
- genotype – table holding decission weights (consant input)
- phenotype – the outcome behavoiur of specimen
- fitness (fitness) function will evaluate individuals in terms of completing the game in the shortest time and distance covered possible

The meaning of terms in our game

- crossing-over - will involve combining several random individuals into one
- mutation - will introduce random changes to the genotype to introduce diversity in the population
- the next generation is created after the mutation





Thank You for attention!