Introduction to Machine Learning - Questions Evolutionary Algorithms

Prepared by Antoine Cully

Autumn 2020/2021

1 Questions

For the following problem determine how you will solve it using genetic/evolutionary algorithms:

- Neuro-evolution: How to find the weights and biases of the following network: 3 inputs, 1 hidden layer with 4 neurons, one output. The task is a binary classification task (a corresponding dataset is provided).

For this, you can answer the following Questions:

1. Give a suitable genotype, phenotype, and function used to develop a genotype into a phenotype, that you would use to solve the problem described above. Provide a short explanation of your choice.
2. Choose the genetic operators that can be used to solve this problem (given the genotype you defined in the previous part) and explain how they work.
3. Define the fitness function that can be used to solve this problem. Explain your answer in a clear and compact manner.
4. Give the pseudo code of the genetic algorithm, using the operators and elements you defined above. Detail the parameter values that need to be defined, and explain their role. For each of the parameters that you will describe, give a potential value and explain your choice.