

Assignment 11

GP

Aims:

To solve a problem using GP.

Task:

Specify, design and deploy an application in python that solves your assigned problem. The applications should follow the following conditions:

1. it must have a nice layered architecture of MCV type
2. the training data for the problem (if need it) will be in a text file 'training.in',
3. the input data for the system will be in 'input.in' and the output in the file 'output.out' also the inputs and the results will be printed on console

Points:

- 90 points - the algorithm.
- 10 points for the architecture and for the quality of your application.

Time:

The deadline is at the beginning of the last laboratory.

Problems:

6. Set the **direction of movement** of a robot (front, right turn, right turn, left turn) equipped with sensors based on previously collected information (in the form of readings of 24 ultrasonic sensors placed in different positions on the robot - the position of a sensor being given by the deviation angle - 180 (front), -165, -150, ..., 15, 0 (back), 15, 30, ..., 150, 165) and using a genetic programming algorithm. The set of functions will contain at least operators +, -, *, sin, cos, and the terminal set will contain the input of the problem and 10 constants from [0,1]. The evolution of the evolution algorithm ends when the classification accuracy is greater than ϵ (given as a parameter of the problem). Test data will be taken from here: <http://archive.ics.uci.edu/ml/datasets/Wall-Following+Robot+Navigation+Data>.