

SECOND ASSIGNMENT

The second assignment consists in writing a program that builds and tests the Hopfield Associative Memory with the Hebb rule. All parts of the program except for GUI must be written without using external libraries (in particular the NN-related libraries).

- 1) INPUT in the form of an external file or provided in an interactive way by the user. BOTH POSSIBILITIES (external *.txt file and by means of GUI) NEED TO BE AVAILABLE IN THE PROGRAM
- 2) Calculation of the Hopfield Associative Memory
- 3) Iterative testing of any input vector: the user provides a test vector and the system outputs the HAM vector; next the user may input another vector – receive the output, etc.
- 4) The program must allow calculation (testing) the output for ANY input vector of appropriate size NOT ONLY one of the base / stored vectors.
- 5) The program must be able to handle both UNIPOLAR and BIPOLAR vectors;
- 6) NOTE THAT the final outcome may not be available just after the first iteration.

NOTE that, sometimes you must iterate several times. You may end iterations ONLY in either one of the two following cases:

- a. In the current iteration the output vector is equal the input one → then you print this vector as the network's response; OR
- b. you enter a cycle of length two → in which case you print an information about entering a cycle and output both alternating outputs.

Max 20 points → possibility of reading the input vectors from external file and of providing input vectors via GUI (interactively) – 5 pts; Proper calculation of the HAM – 5pts; Proper testing of the vectors – 5pts, quality of documentation – 5 pts.

In the documentation you should describe the idea of HAM and the user interface of the program, and present the results and conclusions of your own test made PRIOR to sending the program to me for the assessment.

Documentation has to be submitted together with the executive program and the code.

Start – 23.04.2024

Consultations (optional) – 7.05.2024

End - (submission deadline) 14.05.2024 – 3 PM

STARTING EACH NEW WEEK OF DELAY → minus 5 PTS. (max 2 weeks delay)