Computational Intelligence & Adversarial Machine Learning:

Project #3

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Project #3

(Due 10/20/2019)

Project #3

- Given the dataset, "Project3_Dataset_v1.txt", create a second dataset where any training instance with a desired output > 0.5 is relabeled as 1.0 and any training instance that has a desired output <= 0.5 is relabeled as -1.0. Name this second dataset, Project3_Dataset_v2.txt."
- Given the two datasets implement the following and record the statistics presented for Homework #2 for (the first dataset is for Tasks 1, 2, 4 and the second dataset is to be used for Task 2:
  1. General Regression Networks (GRNNs)
     a. Evolve σ using a Steady-State Genetic Algorithm (SSGA)
     b. Evolve both σ and whether a training instances is within the GRNN similar to EGRNN-I
  2. Radial Basis Function Neural Networks (RBFNNs)
     a. A RBFNN without Kohonen Unsupervised Learning and Backpropagation
     b. A RBFNN with Kohonen Unsupervised Learning and Backpropagation
  3. Support Vector Machines (SVMs)
     a. Linear SVM (using Scikit-Learn, 2nd Dataset Only)
     b. Radial Basis SVM (using Scikit-Learn, 2nd Dataset Only)
  4. Feedforward Neural Network (Scikit-Learn, with 1, 2, 4 Hidden Layers)

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Project #3 (cont.)

- Write a paper using IEEE format documenting your work:
  I. Title
  II. Authors
  III. Abstract
  IV. Introduction
  V. Methodology
  VI. Experiment
  VII. Results
  VIII. Breakdown of the Work
  IX. References

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Project #3 (cont.)

- The points for this project will be broken down as follows:
  - Program/Demo 60pts
    - GRNNs 15pts
    - RBFNNs 15pts
    - SVMs 15pts
    - FFNNs 15pts
  - Paper 40pts
  - 10pts Extra Credit if you can determine which of the population sizes was used to generate the dataset (3, 12, 25, 50, 100) given a mutation amount of 0.01.

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Have a Great Day!!!

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