Extra Credit EC6: MLP Wumpus

CS 4300
Fall 2015

Assigned: 1 December 2015

Due: 17 December 2015 (10:45am)

For this problem, handin a lab report pdf (include name, date, assignment and class number in pdf) which describes how to train an ANN to classify sensor images of a Pit, the Wumpus or the Gold. Use the training images found in the class data directory (file: Part2_data contains the 3 original RGB images, Gold, Pit, and Wumpus, as well as 3 struct arrays G, P, and W which have 20 images each as e.g., G(t).im). Several aspects of the MLP which deserve careful attention:

- Input vector: there are several possibilities, including:
    - Threshold the image to get a binary image, and then use properties of the thresholded image as input features.
    - Low-level features: e.g., edge responses
    - High-level features: e.g., texture.
- Hidden layers:
    - How many hidden layers? (minimum of 1)
    - How many nodes per layer?
- Algorithm parameters:
    - Stopping criterion
    - Weights on gradient descent
- Data Management:

– How to select training, testing, and validation sets?

You should handin the report pdf as well as the code used in the study. The code should conform to the style requested in the class materials.

Write a lab report in the format (please do not deviate from this format!) described in the course materials.

Discuss the statistical framework to establish a confidence interval on the means, and the hypothesis test.