

Term Project Phase I

(100 points)

Assigned Date: Thursday, October 6, 2016

Due Date: 4:00 PM Thursday, October 20, 2016

Educational Goal

Become familiar with supervised and unsupervised learning using neural networks.

Requirements

In this project, you will be using neural networks

MassHousing Project:

Project goal: predict the Financial Rating Letter Grade in year 2010.

Project data: the data can be accessed from your Blackboard account/Course Materials/MassHousing Project

Training data: all the data collected before year 2010

Test data: the data collected in year 2010

Software tools: a Feedforward Neural Networks of your choice

Programming language: any language of your choice

Evaluation metric: accuracy = (# of correct predicated values)/ total number of entries

Crime Forecasting Challenge:

Project goal: predict all CFS in August, 2016

Project data: http://nij.gov/funding/Pages/fy16-crime-forecasting-challenge.aspx?utm_source=Eblast-Listserv&utm_medium=Email&utm_content=fy16-crime-forecasting-challenge-Kickoff&utm_campaign=ForecastingChallenge&ed2f26df2d9c416fbddddd2330a778c6=hekbweydea-heejbkjyw#judgingcriteria

Training data: 2016, January through July (zip, 8.17 MB) — posted September 1, 2016

2015, full year (zip, 13.8 MB) — posted September 1, 2016

2014, full year (zip, 12.6 MB) — posted September 1, 2016

2013, full year (zip, 11.7 MB) — posted September 1, 2016

2012, March through December (zip, 9.94 MB)

Test data: August 2016 (zip, 1.44 MB) — posted September 7, 2016

Software tools: a Feedforward Neural Networks of your choice; ArcGIS tool CDs will be provided for each team (many free ArcGIS tutorials are free available, for example, <https://youtu.be/3BkaazSVIbl>)

Programming language: any language of your choice

Evaluation metric: PAI (Prediction Accuracy Index) and PEI* (Predictive Efficiency Index*)

PhD-Student Projects: You are expected to present an end-end pilot project using neural networks by the end of this phase. I will notify your PhD adviser that you are conducting your PhD dissertation related projects in my class.

Submission Requirements

1. One submission per team. Name your file with teamleadlastname_firstname_team#_ph1. For example, team 1 of lead John Smith should name their file as Smith_John_team1_ph1.zip.
2. Prepare 7-minute PPT slides to discuss about your project in class on October 20, 2016 including your project demo, the design of the neural networks, and experimental results.
3. Two files should be submitted under your Blackboard account: 1) submit a single zipped file of all the software programs you developed for this assignment through your Blackboard account. 2) Submit a separate PDF file of your 7-minute PPT slides through your Blackboard account.
4. Submit the paper copy including the PPT slides and program source code. Paper copy should be bound firmly together as one pack (for example, staple, but not limited to, at the left corner). 5 points will be deducted for unbounded homework.
5. No hard copies or soft copies results in 0 points.