Module 7 | Overview

OVERVIEW

This module, we introduce a brief history and explore applications of the neural network. We begin our practice with a simple feed-forward model using the Keras API for TensorFlow. We continue with the convolutional neural network, which is an example of the neural network that models the visual system, and performs well on images tasks.

LEARNING OUTCOMES

This module will support these course level learning outcomes:

* Acquire, clean, and organize data from a variety of sources, including raw data files, SQL  
  databases, and online repositories using the Python programming language.
* Apply toolkits to preprocess large datasets for input to statistical and machine learning  
  algorithms, including methods of feature extraction and dimensionality reduction.
* Apply statistical and machine learning toolkits to large datasets, including applications of  
  regression, classification, and clustering.
* Perform simple visualizations of data.

ASSIGNMENTS

This is an approximation of the amount of time each activity will take the average student. If you find you are taking more time than suggested, please contact me for help.

| ASSIGNMENT ORGANIZER | |
| --- | --- |
| **Activity** | **Time (Hrs)** |
| Study/Reflect Time | 1:00 |
| Participate in [Reading & Discussion: Chapter 5 - Machine Learning (Random Forests Pages 426-432)](https://elearning.mines.edu/courses/52392/discussion_topics/256378) | 1:00 |
| Watch & Study [Instructional Videos & Learning Materials: Random Forests](https://elearning.mines.edu/courses/52392/pages/instructional-videos-and-learning-materials-random-forests) | 0:30 |
| Watch & Study & Complete [Activity: Introductory 3 Blue 1 Brown Videos](https://elearning.mines.edu/courses/52392/pages/activity-introductory-3-blue-1-brown-videos) | 1:30 |
| Watch & Study [Instructional Videos & Learning Materials: Introduction to Neural Networks](https://elearning.mines.edu/courses/52392/pages/instructional-videos-and-learning-materials-introduction-to-neural-networks) | 1:00 |
| Submit [Semester Project: Update #3](https://elearning.mines.edu/courses/52392/assignments/354758) | 3:00 |
| Submit [Project 7: Random Forest](https://elearning.mines.edu/courses/52392/assignments/354749) | 4:00 |
| Submit [Project 8: Neural Network](https://elearning.mines.edu/courses/52392/assignments/354751) | 2:00 |
| **Sunday, 11am - 12:00 pm Mountain Time**- Complete [Final Exam Quiz 3 of 3 (Random Forest and Neural Networks)](https://elearning.mines.edu/courses/52392/quizzes/74265) | 1:00 |
| Total Hours: | 15:00 |