

CSYE 7270

Building Virtual Environments

Analytics

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Analytics

Counts towards assignment score

Game Machine Learning/Analytics

(100 Points) Develop Machine Learning/Analytics for your Game

Develop Machine Learning/Analytics for your Game. Implement your analytics in a game.

You can build a Machine Learning/Analytics model from scratch or tweak an existing model. If you tweak an existing model you must provide the source of the base model, and reference it.

Possible Machine Learning/Analytics techniques include:

- i. Fundamental principles of learning algorithms: regression and logistic regression, decision trees, ensemble classifiers, generative/likelihood methods
- ii. Local methods: clustering and collaborative filtering
- iii. Bayesian Learning, Naive Bayes
- iv. Ensemble methods: Bagging, boosting
- v. Text Classification, Bag of words representation, Sentiment Analysis
- vi. Neural networks
- vii. Time Series Prediction and Forecasting
- viii. Time Series Similarity
- ix. Anomaly detection
- x. Subgraph Pattern Mining
- xi. Graph Search
- xii. Link analysis and random walks
- xiii. Social Network Analysis
- xiv. Etc.

Scoring Rubric

100 points possible

Requirement	Points
Analytics Model	40
Implementation in a game.	40
Tests	10
Quality	10

Submission

You will submit your assignment via BlackBoard.

Click the title of assignment (blackboard -> assignment -> <Title of Assignment>), to go to the submission page.

Game Machine Learning/Analytics Resources.

All free online

Textbooks are all available for free to NEU students via SpringerLink (<http://link.Springer.com/>). You must access SpringerLink from an NEU IP address to have full access and/or download these books.

An Introduction to Statistical Learning with Applications in R (2013)

Authors: Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani

Free online via SpringerLink (<http://link.Springer.com/>) <http://link.springer.com/book/10.1007/978-1-4614-7138-7>

ggplot2: Elegant Graphics for Data Analysis (2009)

Authors: Hadley Wickham

Free online via (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-0-387-98141-3>

R Quick Syntax Reference

Authors: Margot Tollefson

Free online via SpringerLink (<http://link.Springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4302-6641-9>

Probability for Statistics and Machine Learning Fundamentals and Advanced Topics (2011)

Authors: Anirban DasGupta Springer Texts in Statistics

Free online via SpringerLink (<http://link.Springer.com/>) <http://link.springer.com/book/10.1007/978-1-4419-9634-3>

The Elements of Statistical Learning: Data Mining, Inference, and Prediction (2011)

Authors: Trevor Hastie, Robert Tibshirani and Jerome Friedman

Free online http://web.stanford.edu/~hastie/local.ftp/Springer/OLD/ESLII_print4.pdf

Beginning Data Science with R

Authors: Manas A. Pathak

Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-3-319-12066-9>

Recommended Texts

Data Mining with Rattle and R The Art of Excavating Data for Knowledge Discovery (2011)

Authors: Graham Williams

Free online via SpringerLink (<http://link.springer.com/>) <http://link.springer.com/book/10.1007/978-1-4419-9890-3>

Machine Learning with R Cookbook

Authors: Yu-Wei, Chiu (David Chu)

PDF: <http://lib.psylab.info/files/Chiu2015.pdf>

Bayesian Essentials with R

Authors: Jean-Michel Marin, Christian P. Robert

Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4614-8687-9>

Text Analysis with R for Students of Literature

Authors: Matthew L. Jockers

Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-3-319-03164-4>

R Machine Learning Essentials

Authors: Michele Uselli

PDF: <http://lib.psylab.info/files/Uselli2014.pdf>

Introductory Time Series with R

Authors: Andrew V. Metcalfe, Paul S.P. Cowpertwait

Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-0-387-88698-5>

R Graphs Cookbook Second Edition

Authors: Jaynal Abedin and Hrishi V. Mittal

PDF: <http://lib.psylab.info/files/Mittal2015.pdf>

R Graph Essentials

Authors: David Alexander Lillis

PDF: <http://lib.psylab.info/files/Lillis2014.pdf>

Mastering Predictive Analytics with R

Authors: Rui Miguel Forte

PDF: <http://lib.psylab.info/files/Forte2015.pdf>

Data Analytics - Models and Algorithms for Intelligent Data Analysis 2012

Authors: Thomas A. Runkler

ISBN: 978-3-8348-2588-9 (Print) 978-3-8348-2589-6 (Online)

<http://link.springer.com/book/10.1007/978-3-8348-2589-6>

Computational Social Network Analysis: Trends, Tools and Research Advances 2010

Editors: Ajith Abraham, Aboul-Ella Hassanien, Vaclav Snázel

ISBN: 978-1-84882-228-3 (Print) 978-1-84882-229-0 (Online)

<http://link.springer.com/book/10.1007/978-1-84882-229-0>

Biostatistics with R

Authors: Babak Shahbaba

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-1-4614-1302-8>

Introduction to Probability Simulation and Gibbs Sampling with R

Authors: Eric A. Suess, Bruce E. Trumbo

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-0-387-68765-0>

A Modern Approach to Regression with R

Authors: Simon Sheather

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-0-387-09608-7>

R by Example

Authors: Jim Albert, Maria Rizzo

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-1-4614-1365-3>

Graphical Models with R

Authors: Søren Højsgaard, David Edwards, Steffen Lauritzen

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-1-4614-2299-0>

Data Manipulation with R

Authors: Statistical Computing Facility Phil Spector

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-0-387-74731-6>

A Tiny Handbook of R

Authors: Mike Allerhand

Free online via SpringerLink (<http://link.springer.com/>)

<http://link.springer.com/book/10.1007/978-3-642-17980-8>

Bayesian Networks in R

Authors: Radhakrishnan Nagarajan, Marco Scutari, Sophie Lèbre
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4614-6446-4>

Introducing Monte Carlo Methods with R
Authors: Christian Robert, George Casella
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4419-1576-4>

Two-Way Analysis of Variance
Statistical Tests and Graphics Using R
Authors: Christian Robert, George Casella
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4614-2134-4>

Applied Spatial Data Analysis with R
Authors: Roger S. Bivand, Edzer Pebesma, Virgilio Gómez-Rubio
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-1-4614-7618-4>

Nonlinear Regression with R
Authors: Christian Ritz, Jens Carl Streibig
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-0-387-09616-2>

Statistical Analysis with R
Authors: OLEG NENADIC´ , WALTER ZUCCHINI
PDF: http://www.statoek.wiso.uni-goettingen.de/mitarbeiter/ogi/pub/r_workshop.pdf

R Statistical Application Development by Example Beginner's Guide
Authors: Robert J Knell
PDF: <http://www.introductoryr.co.uk/Introductory%20R%20example%20chapters.pdf>

An Introduction to R for Quantitative Economics
Authors: Vikram Dayal
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-81-322-2340-5>

The Environment in Economics and Development
Authors: Vikram Dayal
Free online via SpringerLink (<http://link.springer.com/>)
<http://link.springer.com/book/10.1007/978-81-322-1671-1>