# Research Design and Applications for Data Analysis

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#### **Storing and Retrieving Data**

The Discipline of Organizing - Glushko Bad

Data Handbook - O'Reilly - McCallum Optional:

Doing Data Science - O'Reilly - O'Neil & Schutt

Data Science for Business - O'Reilly - Provost & Fawcett Machine Learning for Hackers - O'Reilly - Conway & White

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Download this week's chapter 2: MapReduce Basics

Download this week's chapter 7: Limitations on MapReduce Stonebraker, M., Abadi, D., DeWitt, D. J., Madden, S., Paulson, E., Pavlo, A., & Rasin, A. (2010, January). MapReduce and parallel DBMSs: Friends or foes? Communications of the ACM, 53(1).

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#### **Exploring and Analyzing Data**

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## **Applied Machine Learning**

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Optional: Provost and Fawcett. Data science for business.

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Read Paul Graham on Naive Bayes in 2002.

Skim Michael Collins tutorial on Naive Bayes (with math), see pages 1–4.

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Read as much as you can Carter, T. (2001, June). An introduction to information theory and entropy.

Read blog post from yhat about predicting churn. Read short introduction to Adaboost

Read Chapter 5 of Schutt & O'Neill. (2013). Doing data science. Read Section 4.6 of Whitten, Frank, & Hall. Data mining.

Optional: Chapter 3 (Sections 3.1 and 3.2), Chapter 4 (especially section 4.4), and Chapter 6 (sections 6.16.3) of Friedman, Hastie, & Tibshirani. The elements of statistical learning.

Read Chapter 6 of Daum, H. A course in machine learning.

Read Chapter 8 of Daume. A course in machine learning.

Read Chapter 7 (section 7.4) of Whitten, Frank, & Hall. Data mining.

Optional Cosma Shalizi SVM lecture notes.

Read An empirical comparison of supervised learning algorithms.

Skim On comparing classifiers: Pitfalls to avoid and a recommended approach. Skim SKLearn classifier comparisons for toy problems.

Read Chapter 7 (sections 7.1–7.3) of Rajarman et al. Mining of massive datasets.

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## **Visualizing and Communicating Data**

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## **Field Experiments**

FE: <u>Field Experiments: Design, Analysis, and Interpretation</u>, by Alan S. Gerber and Donald P. Green

MHE: <u>Mostly Harmless Econometrics: An Empiricist's Companion</u>, by Joshua D. Angrist and Jörn-Steffen Pischke (MHE).

MTGI: <u>More Than Good Intentions</u>, by Dean Karlan and Jacob Appel. This is a popular-press book rather than a textbook; it introduces us to many examples of valuable experiments in development economics.

**NYTimes HRT article** 

<u>Feynman</u>

three news articles

Lewis and Reiley [through section III.B]

Karlan and Appel book: focus on chapters 1, 5, 8, 9.

<u>Lewis and Rao</u> [sections 1, 3.1, 3.2, 4.1, 4.2]

Ayres et al. (Opower)

Skim <u>List and Lucking-Reiley</u>

Johnson, Lewis, and Reiley (Sections 1, 2, 3.1, 4.3)

Goodson

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