

Machine Learning Guidelines for Natural Resource Management Practitioners

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Chapter 1

Motivation

As machine learning (ML) has become a powerful tool, it is noted by some that ML has not been widely used in environmental studies. This booklet is meant to provide a concise guide for natural resource management practitioners. This book serves as a starting point rather than a comprehensive resource, so that practitioners can have a basic understanding of how ML works and how to utilize it to analyze data and answer research questions. When appropriate, we provide case studies and R code as well as other online resources to help the readers on the journey of gaining one powerful tool that seems to be omnipresent in the research world.

Chapter 2

Introduction

What is machine learning?

2.1 Supervised Learning

2.2 Unsupervised Learning

Chapter 3

Data

3.1 What to do with data?

One could argue that data is the single most important ingredient when it comes to machine learning models or any type of analysis. As one might say, junk in, junk out.

3.2 Data Requirement

Chapter 4

Evaluation

4.1 Continuous Responses

4.2 Discrete Responses

4.3 Cross Validation

Chapter 5

Machine Learning Methods

Here we provide a list of commonly used machine learning methods and some brief discussion.

5.1 Random Forest

Chapter 6

Presentation

It is also important to present the results in a way that aids rather than impede communication.

6.1 Table

6.2 Figure

Chapter 7

Ethical Considerations

7.1 Reproducibility

Chapter 8

Appendix

8.1 Do's and Don'ts