3950 Exam 1 Guide

# Overview

The quiz is short answer, point form, on the major concepts of machine learning from the first 6 weeks of the course. There is no coding on the exam. It is open book.

# Topics

This list of topics is representative, but not exhaustive.

## Predictive Algorithms

* Trees and derivatives (e.g. forests).
* Linear regression and derivatives (e.g. Lasso/Ridge)
* Logistic regression.
* Support vector machines.

## Concepts

* Gradient descent.
* Regularization.
* Supervised / unsupervised learning.
* Underfitting / overfitting.
* Feature Importance and selection.
* Hyperparameters and tuning (e.g. grid search).
* Cross validation.
* Transformations (e.g. basis functions and kernels).
* Basics of computational efficiency (e.g. what’s really slow).
* Natural language processing.
* Basic images.
* Dimensionality reduction (e.g. T-SVD and PCA)

## Data Preparation

* Imputation.
* Encoding.
* Scaling.
* Categorical / numerical.
* Pipelines.