AdvBayesLearnCourse

Public

1 Branch 1 Tag Go to file t Go to file Add file Code

mattiasvillani upd readme for Lab4 b3734b6 · 2 months ago

.vscode	update readme 2024 editi...	9 months ago
Code	update readme 2024 editi...	9 months ago
Labs	Lab 4 added for the 2024 ...	2 months ago
Material	update readme 2024 editi...	9 months ago
Misc	adding image linocut	2 months ago
Notes	Added Note with derivati...	4 years ago
Slides	update	2 months ago
.gitignore	removed test	4 years ago
README.md	upd readme for Lab4	2 months ago
Splines.png	Added slides for lecture 1 ...	4 years ago
VI.jl	update readme 2024 editi...	9 months ago
_config.yml	Changed title	4 years ago

README

Advanced Bayesian Learning - PhD course, 8 credits

Course information

About

Course material for the PhD course in Advanced Bayesian Learning

Readme
Activity
56 stars
10 watching
18 forks

Releases 1

edition2020 Latest
on Feb 15

Packages

No packages published
Publish your first package

Deployments 80

github-pages 2 months ago

+ 79 deployments

Languages

PostScript 93.8% **Julia** 4.8%
R 1.4%

The typical participant is a PhD student in Statistics or related fields (Mathematical Statistics, Engineering Science, Quantitative Finance, Computer Science, ...). The participants are expected to have taken a basic course in Bayesian methods, for example Bayesian Learning at Stockholm University, and to have some experience with programming.

Examination and Grades: The course is graded Pass or Fail. Examination is through individual reports on distributed problems for each topic. Many of the problems will require computer implementations of Bayesian learning algorithms.

Course organization The course is organized in four topics, each containing four lecture hours. Course participants will spend most of their study time by solving the problem sets for each topic on their own computers without supervision.

All lectures are given online using Zoom.

Welcome!

Mattias Villani
Professor of Statistics, Stockholm University

Topic 1 - Gaussian processes regression and classification

Reading: Gaussian Processes for Machine Learning - Chapters 1, 2.1-2.5, 3.1-3.4, 3.7, 4.1-4.3.
Code: GPML for Matlab | GPy for Python | Gausspr in R | Gaussianprocesses.jl in Julia | GPyTorch - GPs in PyTorch
Other material: Visualize GP kernels

Lecture 1 - May 3, hours 10-12
slides
Lecture 2 - May 3, hours 13-15
slides

Lab Topic 1
Problems | Lidar data

Topic 2 - Mixture models and Bayesian nonparametrics

Reading: Bayesian Data Analysis - Chapter 23 | The Neal (2000) article on MCMC for Dirichlet Process Mixtures

Widgets: Dirichlet distribution | Bayes for multinomial data | mixture of normals | mixture of Poissons

Lecture 3 - May 17, hours 10-12
slides
Lecture 4 - May 17, hours 13-15
slides | derivation marginal Gibbs

Lab Topic 2
Problems | Galaxy data

Topic 3 - Variational inference

Reading: Blei et al JASA | Tran's VI Notes
Other material: Kullback-Leibler widget | My recent talk with some VI | Natural gradient notes | autograd in python | ForwardDiff in Julia

Lecture 5 - May 31, hours 10-12
slides
Lecture 6 - May 31, hours 13-15
slides

Lab Topic 3
Problems | Time series data

Topic 4 - Bayesian regularization and variable selection

Reading: Sections 12.2-12.5 and 14.6 of Bayesian Learning book | Handbook chapter on variable selection | Article on Bayesian regularization

Lecture 7 - Sept 6, hours 10-12
slides
Lecture 8 - Sept 6, hours 13-15