Master's Thesis

My Super Fancy Thesis Title

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Submitted in partial fulfillment of the requirements for the degree of M. Sc.
Supervised by Dr Dre

Abstract

This is my new abstract.

Contents

1 Introduction

1.1 Motivation

1.2 Problem

- in high dimensional, complex posteriors we are often confronted with ill-conditioned Hessians
- this might lead to slow convergence when the sampler is not able to accord to this
- we can show this effect on some simple gaussian (mixture) examples

Note: the visualizations show the true density in the background, while compute the steps of the MCMC sampler on samples of the log density.

1.3 Research Objective

- use preconditioning
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By investigating this research objective we contribute to the field of MCMC sampling in the following ways:...
Name here what was developed in the end and how it contributes to the field.

1.4 Outline

2 Method

2.1 General Idea

- best case would be to compute the inverse Fisher Information Matrix in each step as preconditioning to apply to local geometry of the current position
- cannot be done in our MCMC preconditioning context since it is much to expensive to estimate the FIM in every step from scratch
- we cannot do a Hessian approximation like RmsProp or Adam, since they utilize values depending which depend on previous steps. This does then not meet meet the markov property (MCMC theory breaks)
- this is why we optimize first obtaining a high likelihood soultion and a rough estimation of the local geometry (via Adam like Hessia approximation or IVON)
- using this information might help shorten the warmup/burnin phase without hurting the performance

- during sampling we then want to efficiently sample the a local subspace of the high dimensional posterior where the optimizer landed
- multimodality is tackled through ensembling and lengthy markov chains

A concise summary of contents and results

A Appendix

Additional material goes here

B Electronic appendix

Data, code and figures are provided in electronic form.

Declaration of authorship

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Location, date

Name