Reproducing the paper: *Stochastic Gradient Hamiltonian Monte Carlo* by Tianqi Chen, Emily B. Fox and Carlos Guestrin

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Abstract

We reproduce the experiments contained in 'Stochastic Gradient Hamiltonian Monte Carlo' [CFG14] by Chen, Fox and Guestrin.

FiXme: Give more details in abstract

List of Corrections

1 Introduction

- Overview of paper and its context.
- Which experiments replicated, and rationale for this choice.
- Target questions of paper.
- Experimental methodology.
- Implementation details.
  - Integration with Pyro.
  - Which parts are new, and which are from publicly available code?
  - Details about how key aspects were implemented.
- Link to repository.
- New aspects?

2 Background

- Hamiltonian Monte Carlo.
- Naïve Stochastic Gradient HMC.
- SGHMC using friction.

3 Experiments

- Describe experiments and compare with results in the paper.

3.1 Simulated examples

3.2 Bayesian Neural Networks for Classification

4 Extensions

4.1 NUTS

5 Conclusion

- Analysis and discussion of findings.
- Suggest what could have been done with more time.

References

[CFG14] Tianqi Chen, Emily Fox and Carlos Guestrin. 'Stochastic Gradient Hamiltonian Monte Carlo'. In: *Proceedings of the 31st International Conference on Machine Learning*. Ed. by Eric P. Xing and Tony Jebara. Vol. 32. Proceedings of Machine Learning Research 2. Bejing, China: PMLR, June 2014, pp. 1683–1691. URL: https://proceedings.mlr.press/v32/cheni14.html.