



UNIVERSITY OF  
OXFORD

# AdaGeo: Adaptive Geometric Learning for Optimization and Sampling

Gabriele Abbati<sup>1</sup>, Alessandra Tosi<sup>2</sup>, Michael A Osborne<sup>1</sup>, Seth  
Flaxman<sup>3</sup>

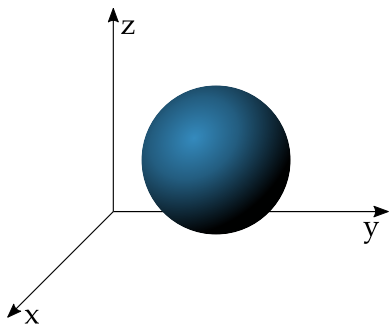
<sup>1</sup>University of Oxford, <sup>2</sup>Mind Foundry Ltd, <sup>3</sup>Imperial College London

Advances in Approximate Bayesian Inference  
NIPS 2017 Workshop



# The Manifold Idea

High-dimensional sampling and optimization can be hindered by issues such as non-convexities, correlations, different scales etc.

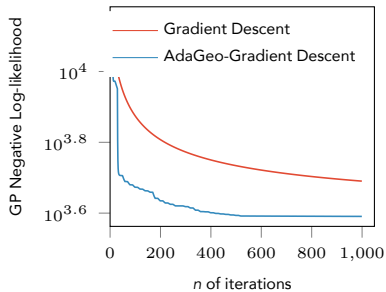
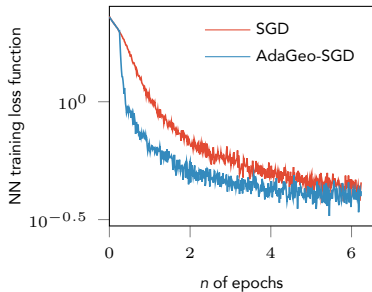
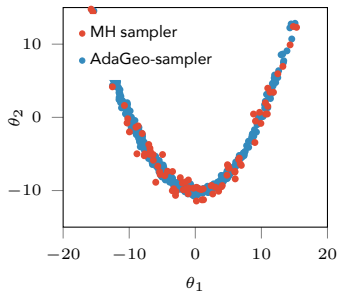


After  $t$  steps, we propose to assume the samples or optimization steps to be on a manifold and identify the latter with **Gaussian Process Latent Variable Models**

We then incorporate the newly acquired information in the algorithm and resume the computation.



# Results





UNIVERSITY OF  
OXFORD

# Thank you

Paper #1