



Numerical Analysis Seminar

Convergence and Robustness of Gaussian Process Regression

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Abstract

We are interested in the task of estimating an unknown function from data, given as a set of point evaluations. In this context, Gaussian process regression is often used as a Bayesian inference procedure, and we are interested in the convergence as the number of data points goes to infinity. Hyper-parameters appearing in the mean and covariance structure of the Gaussian process prior, such as smoothness of the function and typical length scales, are often unknown and learnt from the data, along with the posterior mean and covariance. We work in the framework of empirical Bayes¹, where a point estimate of the hyper-parameters is computed, using the data, and then used within the standard Gaussian process prior to posterior update. Using results from scattered data approximation, we provide a convergence analysis of the method applied to a fixed, unknown function of interest.

[1] A.L. Teckentrup. Convergence of Gaussian process regression with estimated hyper-parameters and applications in Bayesian inverse problems. *SIAM/ASA Journal on Uncertainty Quantification*, 8(4), p. 1310-1337, 2020.

Date:	May 11, 2022 (Wednesday)
Time:	4:00 – 5:00pm (Hong Kong Time)
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 913 6532 3891 Password: 310656

All are welcome