

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

Adaptive multi-fidelity surrogate modeling for Bayesian inference in inverse problems

By

**Prof. ZHOU Tao
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Bibliography

Prof. Zhou Tao is currently an Associate Professor at Institute of Computational Mathematics, Chinese Academy of Sciences. Before joining Chinese Academy of Sciences, he worked as Postdoc at Swiss Federal Institute of Technology in Lausanne, Switzerland. Prof. Zhou's research interest is uncertainty quantification, stochastic computing methods and high-dimensional approximation methods. He has received many honors, including the Youth Science and Technology Award (青年科技奖) from China Society of Industrial and Applied Mathematics, and Chen Jing-Run Future Star Award (陈景润未来之星), and Outstanding Young Scientist Fund (优秀青年科学基金). He is also the Chief Scientist of the National Science, Technology and Industry Commission's scientific challenge project "Complex System Model Uncertainty Evaluation Method" (国防科工委专题项目首席科学家). Prof. Zhou is Associate Editor in Chief of International Journal for Uncertainty Quantification, and Associate Editors of many important mathematics journals, including SIAM Journal on Scientific Computing, Communication in Computational Physics, and Numerical Mathematics: Theory, Methods & Applications. Since 2018 Prof. Zhou is the managing editor of East Asian Journal on Applied Mathematics.

Abstract

The generalized polynomial chaos (gPC) are widely used as surrogate models in Bayesian inference to speed up the Markov chain Monte Carlo simulations. However, the use of gPC-surrogates introduces model errors that may severely distort the estimate of the posterior distribution. In this talk, we present an adaptive procedure to construct an adaptive gPC-surrogate. The key idea is to refine the surrogate over a sequence of samples adaptively so that the surrogate is much more accurate in the posterior region. We then introduce an adaptive surrogate modeling approach based on deep neural networks to handle problems with high dimensional parameters.

Date : 6 August, 2020 (Thursday)

Time : 14:00-15:00 (Hong Kong Standard Time GMT +8)

Venue : Online Talk via Zoom(Meeting ID: 96875986857)

Click to join : <https://polyu.zoom.us/j/96875986857>

* The Talk will be given in English.



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