

Bayesian Probabilistic Numerical Methods (Part I)

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It will be argued that the emergent field of probabilistic numerics has thus far lacked rigorous statistical foundations. This talk aims to establish “Bayesian” probabilistic numerical methods as those which can be cast as solutions to certain Bayesian inverse problems, albeit problems that are non-standard. This allows us to elicit general mathematical conditions under which Bayesian probabilistic numerical methods are well-defined, encompassing both non-linear and non-Gaussian models. Next, the focus turns to experimental design, where we discuss how established results from average case numerical analysis can be used to derive optimal Bayesian probabilistic numerical methods.