



BISP8

**Eighth Workshop on  
BAYESIAN INFERENCE IN STOCHASTIC PROCESSES**

## **Sequential Inference with Iterated Laplace Approximation**

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In real-time applications with strict time constraint, sequential inference is becoming more and more important. However, particle filter, the main approach of sequential inference, suffers from the degeneracy problem where only few samples in the whole population have significant weights. In dynamic models with unknown parameters, sequential parameter learning becomes much more difficult as there is no regeneration for the parameter. Also, the degeneracy may in turn affect the sufficient statistics approach of the parameter learning. So, in this poster, we try another approach by applying a smooth functional approximation, iterated Laplace approximation (Bornkamp, 2011), sequentially for the filtering problem of both state vectors and parameters. The method is tested with some dynamic model examples.

### **Keywords:**

dynamic model; sequential inference.

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**ABSTRACT  
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