17th Eawag Summer School in Bayesian Methods for Environmental Modelling (preliminary)

Lecturers: Carlo Albert (CA), Andreas Scheidegger (AS), Dmitri Kavetski (DK), Marco Baity Jesi (MBJ), Alberto Bassi (AB) and Marvin Höge (MH).

Practice sessions: Thiago Nascimento (TN), Cheng Chen (CC).

Sunday, May 31: Optional Preparatory Course

Time	Type	Who	Topic
15:00 - 15:45	lecture	AS	**Review of probability theory**
16:00 - 17:00	practice	CC	Exercises

Monday, June 1: Probabilistic Models

Time	Type	Who	Topic
08:45 - 09:00		CA	**Introduction to the Course**
09:00 - 09:45	lecture	CA	**Probabilistic modelling**
09:45 - 10:15		CA, all	Introduction and expectations of participants
10:45 - 11:15	lecture	AS	**Sensitivity analysis and Monte Carlo simulation**
11:30 - 12:15	lecture	AS	**Likelihood functions**
14:30 - 17:30	practice	TN	Practice of likelihood functions and sensitivity analysis

19:00   barbecue

Tuesday, June 2: Introduction to Bayesian Analysis

Time	Type	Who	Topic
08:30 - 09:15	lecture	DK	**Illustration of Bayesian inference**
09:30 - 10:15	lecture	AS	**Concepts of Bayesian inference**
10:45 - 11:30	lecture	CA	**Bayesian computation with Monte Carlo methods**
11:45 - 12:30	lecture	DK	**Improving models using posterior diagnostics**
14:30 - 17:30	practice	CC/TN	Practice of elementary Bayesian inference

Wednesday, June 3: Advanced Bayesian Computation

Time	Type	Who	Topic
08:30 - 09:15	lecture	DK	**Identifiability analysis**
09:30 - 11:00	lecture	CA	**Advanced Bayesian inference algorithms**
11:15 - 12:00	lecture	AS	**Probabilistic programming languages**
14:00 - 16:30	pracitce	AB	Practice of advanced Bayesian inference
16:30 - 18:30	Poster session		Poster session with flash presentations

Thursday, June 4: ML Techniques

Time	Type	Who	Topic
09:00 - 09:30	lecture	DK	**Optimization techniques**
09:45 - 10:15	lecture	CA	**Emulators**
10:30 - 11:15	lecture	MBJ	**Variational inference**
11:30 - 12:15	lecture	AB	**Overview of ML techniques for Bayesian inference**

Time	Type	Who	Room 1	Room 2
14:30 - 15:30	lecture/practice	DD	Inference with hierarchical models	Repetition (AS) / problems of participants
15:30 - 16:30	lecture/practice	AB	ABC inference for stochastic models	
16:30 - 17:30	lecture/practice	MBJ	Variational Bayes	

Friday, June 5: Further Topics of Bayesian Computation and Applications

Time	Type	Who	Topic
09:00 - 09:45	lecture	DK	**Hydrological modeling, uncertainty and hypothesis testing**
10:00 - 10:45	lecture	MH	**Bayesian model selection**
11:00 - 11:45	lecture	AS	**ML vs Bayes / Q&A**
14:00 - 14:30	discussion	all	**Summary and Feedback**
14:30 - 15:30	cleaning	all	

Link to the exercises: https://www.eawag.ch/summerschool/exercises