

Minutes of PMC Workgroup 1st meeting - SAMSI

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September 11th, 2008, 10:00AM-11:00AM

1 Definition of the goals

Twenty-one persons attending. Table tour followed by a speech from Arnaud Doucet led to highlight:

- This working-group is a **methodology group**, aiming at developing new methodologies,
- with two applications of interest mentionned at first,
 - population genetics and coalescent trees (proposed by Christian Robert and Robert Griffiths),
 - Epidemiology, stemming from a scientific project from France on a dataset from Cuba

A possible line of study is proposed by Arnaud Doucet, Sylvain Rubenthaler, Eric Moulines: getting some inspiration from physics models, with non-linear measure valued systems. Specific classes of nonlinear operators, in which Sylvain is experienced. Reverse-engineering these methods to have them targeting a chosen measure of interest. This is a tentative idea, to be investigated. Exact references of an easy survey by Graham and Méléard will be given later on.

Many interests stem from every participant, among which (but non exhaustively):

- population genetics, analyse the history back in time of the infection process, see Robert Griffiths,
- improvements on SMC samplers, tuning of the algorithm, maybe get inspired from what is done in Simulated Annealing,
- haplotype reconstruction, see Cajo Ter Braak,
- transdimensional inference, SMC as alternative to Reversible Jump MCMC which have inefficient proposal, inference on the line (infinite number of predictors), see Cajo Ter Braak,
- model selection, see Jan Hannig.

Hence, during the first few weeks, we will all work on some fundamental articles, so as to share a common background. It is only after this first common step that we will split into subgroups of interest.

2 For action

For the next meeting, write on paper the very list of things each participant is interested in, along the lines mentionned. We will very very quickly come with a kind of reading list,

- one on SMC as alternative to MCMC – Arnaud will start with a very generic kind of lecture on SMC to start with, and from there discuss more speicalized papers,
- one on these nonlinear operators – Sylvain can give a first few entries,
- one on applications and inference in population genetics.

Cajo Ter Braak can do a presentation about haplotype reconstruction and applications. Robert Griffiths can give us a toy example to get familiar with population genetics but will not be available before September 21st.

Again, this is really a **methodology** group.

3 Practical organization

This section includes precisions added after the meeting

Working groups will meet weekly, on **Fridays, 9:15-11:00AM, SAMSI time**, which makes both West Coast and Europe comfortable. Webex will be used, allows for remote connection by phone and by computer. Technical details will be mailed in advance along with the invitation to the meeting.

E-mail alias for this working group is `smc-population@samsi.info`, reaches every participant.

A webpage will be set-up, with minutes and references publicly available, but articles and slides restricted by password. Webmaster: Julien Cornebise, jcornebise@samsi.info.