Bayesian multimodeling

About the course

- The focus is on the models, especially on the complex compositions of the models
  - Model criteria
  - Model complexity
  - Model search space
  - What is model optimaliy? Suboptimality?
  - How to optimize hyperparamaters and metaparameters? What's the difference?
  - How to combine models?
  - How to operate with different heterogenuos models?

Topics in this term

- Distributions, expectation, likelihood
- Bayesian inference
- MDL
- Probabilistic metric spaces
- Variational inference
- Informative prior, Sampling

Scores

$$\text{Score} = \min(10, \text{round}(2 + \text{Forms} + (\text{Talks} * \text{Project})^{0.5}))$$

- Talks: every class there will be 1-2 talks from students
- Overall score for the talks: 1 talk is 7, 2 talks are 10.
- Forms are **very** simple and done just to have a backoff for the minimal student grade.

No credits for students who didn't give at least one talk.

Projects

Student projects are devoted to reproduce multiple well-established papers and wrap them into an open-source library. For the projects you can make a team up to 4 people (but it means you must implement at least 4 different papers in the project). Approximate schedule of project impelementation:

- Project overview: 17.09.
- Project selection, team construction: 24.09.
- Repository creation, project struccture discussion: 1.10.
- Basic code: 29.10.
- Impelementation of all the algorithms: 26.11.
- Documentation and tests: 3.12.
- Cross-review: 10.12.
- Project is ready. Blog-post publishing: 17.12.

The list of projects and details will be presented next week.

Talk

- Timing: 10-15 minutes
- Structure:
  - Title
  - Task/model motivation
  - Formal problem statement
  - Theory and method description
  - Experiments, examples, applications
  - Literature
  - Two simple questions (will be inserted into the form)
- For poorly done talks the score is zero.

Homework

- Decide certainly if you attend the course
- Fill the form (the link will be on the page course)
- Have a look at libraries we might work with during the project:
  - JAX (and all the JAX ecosystem)
  - Pyro
  - (for enthusiasts) Julia
- Check that you have rights for intsystems orgainziation at github
- For those in charge: check you are able to record classes onto youtube and rutube

Page: https://github.com/intsystems/BMM
TG: see page :)