

Opening remarks

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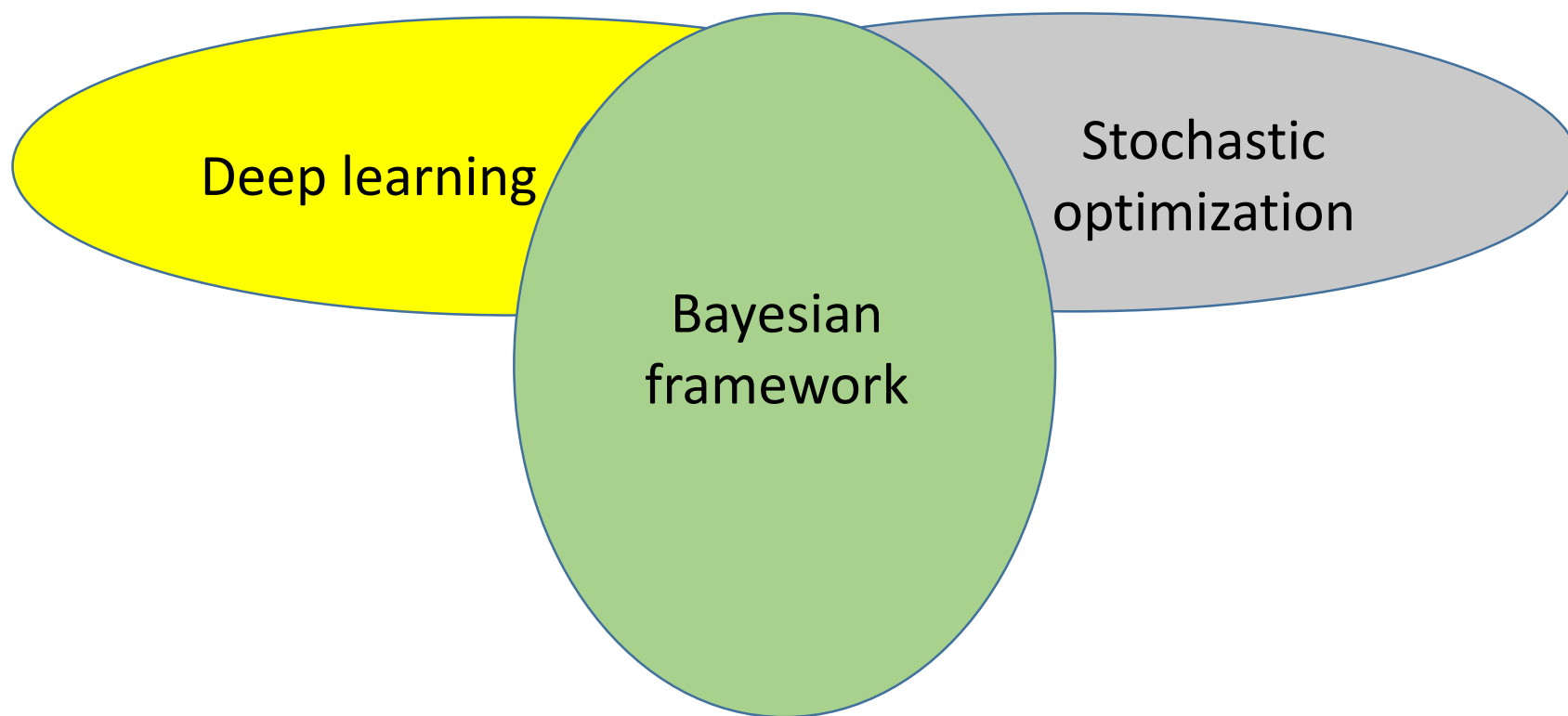
<http://bayesgroup.ru>

Selection

- 298 applications
- About 75 candidates were selected
- Each application was reviewed by two reviewers
- Many strong applications were rejected ☹️



Topic of the school



The charm of Bayes

of Savage and de Finetti, have advanced powerful theoretical reasons for preferring Bayesian inference. A byproduct of this work is a disturbing catalogue of inconsistencies in the frequentist point of view.

Nevertheless, everyone is not a Bayesian. The current era is the first century in which statistics has been widely used for scientific reporting, and in fact, 20th-century statistics is mainly non-Bayesian. [Lindley (1975) predicts a change for the 21st!] What has happened?

2. TWO POWERFUL

The first and most obvious face of two powerful competitors: Fisher and Kiefer called the Neyman–Pearson decision theory, where statisticians

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Bridging the gaps....

Bayesian framework establishes unified formalism and methodology for a variety of different ML problems

- Learning representations (lecture 4, 5)
- Reinforcement learning (lecture 8)
- Regularization (lecture 2, 14)
- Generative models (lecture 13)

Many existing DL algorithms now get Bayesian interpretation that extends their abilities

- Dropout (lecture 15)
- Generative adversarial networks (lecture 13)
- Auto-encoders (lecture 5)

Mathematical tools

The key ingredient are tools that provide scalability

- Stochastic optimization (lecture 3)
- Variance reduction (lecture 5, 9)
- Doubly stochastic variational inference (lecture 5, 8)
- Scalable MCMC algorithms (lecture 10)

Goals

- To establish Bayesian background
- To gain ability to read and understand recent (and future) papers on neuroBayesian models
- To get some experience in using deep probabilistic models
- To understand the spirit of scalability
- To socialize ;-)

Mini-workshop

- 12-13 September on faculty of Computer Sciences
- 4 invited foreign speakers will give four 90 min tutorials
 - Dirichlet processes
 - Deep Gaussian processes
 - Fair learning
 - Combining VAE and GANs
- Presentations from Russian leading research groups

Partners



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