

# HIIT Research Programme on Probabilistic Adaptive systems

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# Mission and Participants

- Mission
  - Study and further develop the theory of sophisticated probabilistic models and explore their applications for solving problems appearing in complex real-world stochastic systems.
- Director
  - Prof. Petri Myllymäki
- Senior researchers
  - Wray Buntine, Jorma Rissanen, Aapo Hyvärinen, **Sami Kaski**
- Volume
  - about 25 person-years / year

# Example Research Challenges

- Theoretical frameworks for probabilistic modelling
  - develop computationally efficient, general-purpose methods for probabilistic modelling, focusing on issues related to model selection, parameter estimation and inference.
- Models for intelligent information access
  - in many modern information networks (like the Internet and various sensor networks), the data can not be found in a well structured format, and accessing the information may be a problem even if the information is in principle available. The goal is to apply probabilistic models for performing information retrieval tasks in this type of environments.

# Example Research Challenges

- Models for image analysis
  - develop probabilistic methods for processing two- or three-dimensional measurement data, with applications in data visualization and denoising, and in the analysis of brain imaging data.
- Models for information processing in the visual system of the brain
  - develop probabilistic computational models on how vision is possible in the brain, and to generalize these principles to different domains of computational neuroscience and computational intelligence.
- Models for probabilistic data fusion
  - develop probabilistic methods for combining inputs originating from heterogeneous data sources

# Some Open Issues Raised

- Project overheads?
  - Follow the policy of the site hosting the project?
- Duties for projects listed in a programme?
  - financial, administrative & scientific reporting?
  - double reporting?
- Public appearance of HIIT
  - business cards? WWW pages? Email addresses?
- HIIT & teaching
  - next call for summer interns organized according to the programmes?
  - M.Sc. thesis projects?
  - HIIT programmes wrt graduate schools?
- Expectations from HIIT
  - Funding: yes, administrative help: yes, management help: yes, infrastructure: yes