

Two PhD Student Positions in Computer Science/ Statistical Physics at the Helsinki University of Technology TKK

Two PhD students are being recruited in the interdisciplinary research group of Professor Erik Aurell at the Helsinki University of Technology TKK (<http://www.tcs.tkk.fi/~eaurell>). The positions are funded jointly by the Academy of Finland and TKK, as a part of support for collaborative research in computer science and statistical physics involving, in addition to Erik Aurell's group, also Professors Pekka Orponen (Computer Science) and Mikko Alava (Physics).

Candidates will be enrolled in the graduate school of the Faculty of Information and Natural Sciences at TKK, and can choose to pursue a degree in Computer Science (Aurell, Orponen) or Physics (Aurell, Alava).

Present projects in the group evolve around understanding very large information systems using methods from statistical physics. Some recent papers address:

- Heuristics for solving very large combinatorial optimisation problems (inventing algorithms, understanding their performance); Alava et al, Circumspect descent prevails in solving random constraint satisfaction problems. *Proc. Nat. Acad. Sci. USA*, 105:15253–15257, 2008.
- Understanding performance and limitations of distributed storage and other peer-to-peer systems through probabilistic modelling; Krishnamurthy et al, An analytical study of a structured overlay in the presence of dynamic membership. *IEEE/ACM Transactions on Networking*, 16:814–825, 2008.
- The inverse problem of reconstructing functional relations between units using massive data; Roudi et al, Statistical physics of pairwise probability models. *arXiv:0905.1410*, 2009.

Projects may also involve an ongoing collaboration with Karolinska Institutet, Stockholm, using massive sequencing for whole transcriptome analysis and various methods of inferring functional relationships between non-coding and other genes in bacterial pathogens, and other systems.

The salaries for these positions are determined according to the TKK salary system for teaching and research personnel, with a starting salary level of 2096,41 Euro/month. The contract includes occupational health and social security benefits.

Application procedure: the candidate should send a CV, references, and at most three (3) letters of recommendation to either Erik Aurell, Pekka Orponen or Mikko Alava (e-mail firstname.lastname@tkk.fi). Review of applications begins on August 15, 2009, and continues until the positions are filled. The contracts are for a maximum of four years, and the successful applicants should preferably start between September 1 and December 1, 2009.