Speakers: Jere Koskela (Newcastle University)

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Title: Consistency criteria for latent tree reconstruction

Abstract:
Tree-valued latent objects are commonplace in genetics, and latent states on internal nodes of fixed trees are also of interest in spin glass models of statistical physics and the analysis of noisy communication networks. Reconstructing a tree from i.i.d. realisations of a Markov process observed only at its leaves is known as the tree reconstruction problem, and is central to all these applications. The asymptotic performance of maximum likelihood estimators for tree reconstruction is well understood, even in the semi-parametric setting when the number of leaves grows with the number of i.i.d. replicates which are available. However, maximum likelihood results have only be obtained under somewhat artificial, a priori discreteness and/or boundedness conditions on branch lengths. I will introduce the tree reconstruction problem, and show that similar asymptotics can be obtained for Bayesian estimators under mild and tractable conditions on the tree prior, without the need for bounded or discretised branch lengths.