



Colóquio Interinstitucional

Modelos Estocásticos e Aplicações

Quarta-feira, 19 de junho de 2013

Programa



14:00 - 15:20 – **Carlos Alberto de Bragança Pereira (USP)**

Nested hypotheses: an example in Genetics

Initial Comment: Treating nested hypotheses is an old important challenge to statisticians. To dramatize the motivation we have chosen an important and common problem in population and human genetics. This talk is based on the article by R. Izbicki, V. Fossaluza, A. G. Hounie, E. Y. Nakano, C. A. Pereira (2011), *Testing allele homogeneity: The problem of nested hypotheses*, BMC Genetics 13:103.

Conclusions: The allelic and genotypic homogeneity test usually described in the literature shows undesirable inconsistencies on its results. We show that even when using a proper frequentist procedure to test allelic homogeneity these inconsistencies still occur. There are no flaws when e-values are used instead. A routine that performs all tests considered in this paper in R Software can be downloaded on www.ime.usp.br/~cpeireira/programs/nested.r.

Keywords: Homogeneity test, FBST, Allele homogeneity, Chi-squared test, Bayesian Methods

15:40 - 17:00 – **Serguei Popov (UNICAMP)**

Soft local times and decoupling of random interlacements

We establish a decoupling feature of the random interlacement process I^u in \mathbb{Z}^d , at level u , for $d \geq 3$. Roughly speaking, we show that observations of I^u restricted to two disjoint subsets A_1 and A_2 of \mathbb{Z}^d are approximately independent, once we add a sprinkling to the process I^u by slightly increasing the parameter u . Our results differ from previous ones in that we allow the mutual distance between the sets A_1 and A_2 to be much smaller than their diameters. We then provide an important application of this decoupling for which such flexibility is crucial. More precisely, we prove that, above a certain critical threshold u^{**} , the probability of having long paths that avoid I^u is exponentially small, with logarithmic corrections for $d = 3$. To obtain the above decoupling, we first develop a general method for comparing the trace left by two Markov chains on the same state space. This method is based in what we call the soft local time of a chain. In another crucial step towards our main result, we also prove that any discrete set can be “smoothened” into a slightly enlarged discrete set, for which its equilibrium measure behaves in a regular way. This is a joint work with Augusto Teixeira.

17:00 – Discussão e lanche

Local

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