Department of Decision Sciences - Bocconi University
Via Roentgen 1 - 20136 Milano
Tel. 02-58365632 - Fax 02-58365630

SEMINAR

"The two-parameter Ewens distribution: a finitary approach"

Paolo Viarengo

(Department of Aerospace Engineering
University of Naples "Federico II")

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Abstract:

The Ewens sampling formula, the most famous example of an exchangeable partition probability function, has been generalized, in the last two decades, by Pitman (1992, 1997) and Zabell (1996) to the two-parameter case, where the weight for the mutation probability depends on the number of existing clusters. Further investigations and applications are, among others, in Gnedin-Pitman (2006), Lijoi et al. (2007) and Aoki (2008).
We present a finite model of economic interacting agents, driven by an homogeneous Markov chain, whose equilibrium aggregation state is described by the two-parameter Ewens distribution.
We derive some essential feature of the model without introducing notions like frequency spectrum, structure distribution nor complex distributions like Mittag-Leffler which seem difficult to apply to concrete finite populations.
A typical example of usefulness of our finite approach is the derivation of the equilibrium mean number of clusters using the balance between birth and death probability instead of the Mittag-Leffler density as in Yamato H. and Sibuya M. (2000).
We also compare the two-parameter Ewens clustering mechanism to the Zipf-Yule-Simon one.
It differs from the Ewens model both for destruction and for creation and the probability of herding is independent of the size of the herd. This assumption destroys the exchangeability of the random partitions and forbids an analytical solution. To this end we introduce a finite Markov chain that approximates the marginal dynamics of a cluster and drives it to a censored Yule distribution.
(joint with Ubaldo Garibaldi)