PRUNING GALTON-WATSON TREES AND TREE-VALUED MARKOV PROCESSES

Romain ABRAHAM *Université d'Orléans, France*
Jean-François DELMAS *Université Paris-Est, France*
Hui HE *Beijing Normal University, Beijing*, E-mail: hehui@bnu.edu.cn

Abstract: We present a new pruning procedure on discrete trees by adding marks on the nodes of trees. This procedure allows us to construct and study a tree-valued Markov process $\{\mathcal{G}(u)\}$ by pruning Galton-Watson trees and an analogous process $\{\mathcal{G}^*(u)\}$ by pruning a critical or subcritical Galton-Watson tree conditioned to be infinite. Under a mild condition on offspring distributions, we show that the process $\{\mathcal{G}(u)\}$ run until its ascension time has a representation in terms of $\{\mathcal{G}^*(u)\}$. A similar result was obtained by Aldous and Pitman (1998) in the special case of Poisson offspring distributions where they considered uniform pruning of Galton-Watson trees by adding marks on the edges of trees; see also Abraham and Delmas (2010) for continuum-tree-valued models.

References

[1] R. Abraham and J.-F. Delmas (2010). A continuum-tree-valued Markov process, *Preprint, arxiv:0904.4175*

[2] D. Aldous and J. Pitman (1998). Tree-valued Markov chains derived from Galton-Watson processes. *Ann. Inst. Henri Poincaré Probab. Statist.*, **34**(5), 637-686.