

Controlled branching processes subordinated by a renewal process

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A class of controlled branching processes in continuous time are introduced in this talk. Given a discrete-time controlled branching process, $\{Z_n, n = 0, 1, 2, \dots\}$, and a renewal process, $\{N_t, t \geq 0\}$, the process $\{Y(t), t \geq 0\}$, with $Y(t) = Z_{N(t)}$ is referred to as CBP *subordinated by a renewal process* or as *randomly indexed* CBP. We assume that the renewal period is the common lifespan of all individuals. We establish limit theorems when the mean of the renewal periods is either finite or infinite with zero being an absorbing state. The results given in the talk have been published in González et al. [1,2]. This work is a collaboration with M. Molina, I. del Puerto, G.P. Yanev and N.M. Yanev.

Acknowledgements:

This research has been supported by grant PID2019-108211GB-I00 funded by MCIN/AEI/10.13039/501100011033, by "ERDF A way of making Europe", and by grant KP-6-H22/3 (National Scientific Foundation of Bulgaria at the Ministry of Education and Science).

References:

- [1] González, M., Molina, M., del Puerto, I.M., Yanev, G.P., Yanev, N.M. (2021a). *Controlled branching processes with continuous time*. Journal of Applied Probability, 58 (3): 830– 848.
- [2] del Puerto, I.M., Yanev, G.P., Molina, M., Yanev, N.M., González, M. (2021b). *Continuous-time controlled branching processes*. Comptes Rendus de l'Académie Bulgare Des Sciences, 74 (3): 332–42