

# FORO DEPARTAMENTO DE MATEMÁTICAS

## MARKOV REGENERATIVE PROCESSES AND ITS APPLICATIONS

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### ABSTRACT

Consider a stochastic process wherein there exist time points where the process satisfies the Markov property. These time points are referred to as regeneration points. In a Markov regenerative process (MRGP) the stochastic evolution between two successive regeneration points depends only on the state at regeneration. As a consequence, all memory other than the state must be reset at a regeneration point. Furthermore, due to the time homogeneity of the embedded Markov renewal process, the evolution of the MRGP becomes a probabilistic replica after each regeneration. In this talk, time dependent behaviour of MRGP is presented. In practice, analyzing the transient behavior of an MRGP is not an easy task. Hence, the limiting behavior of the MRGP is also presented. As particular cases of the MRGP model, queueing examples are provided. Finally, performance modeling of wireless networks with generally distributed handoff inter-arrival times using MRGP is also discussed.

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