PAPOS ALEATÓRIOS

The Renewal Spitzer Process

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Renewal processes are traditional on the theory of stochastic process and are used for modelling lifetimes of components. Multidimensional renewal process are those with interaction, so that failure rates depends on the ages of different components.

In 1986 Frank Spitzer, [4], proposes a multidimensional version of the Renewal Theorem on $(\mathbb{R}_+^{\mathbb{Z}})$ where the renewal rate of each compontent is the gradient of a potential function of ages. Andjel and Vares in [1] have shown the conditions to ergodicity and uniqueness of invariant measure for that process when the rate of failure is the average age of neighbours plus a stabilization constant, c. Sidoravicus and Vares in [3] have extended the results for $(\mathbb{R}_+^{\mathbb{Z}^d})$. Both [1] and [3] have prooved that if $c = 0$ the process does not converge to an invariant measure. [2] have studied the behaviour of o the process for small values of c.

Our aim in this project is to invastigate environments in which the $c > 0$ hypothesis can be flexibilized.

References

[1] E.D. Andjel and M.E. Vares. Ergodicity of an infinite renewal process. *Stochastic Process. Appl.*, 1992.

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[4] F. Spitzer. A multidimensional renewal theory. *Probability, Stathistical Mechanics and Number Theory Advances in Mathematics Supplemental Studies*, 1986.

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