

Simulation of Hawkes Process

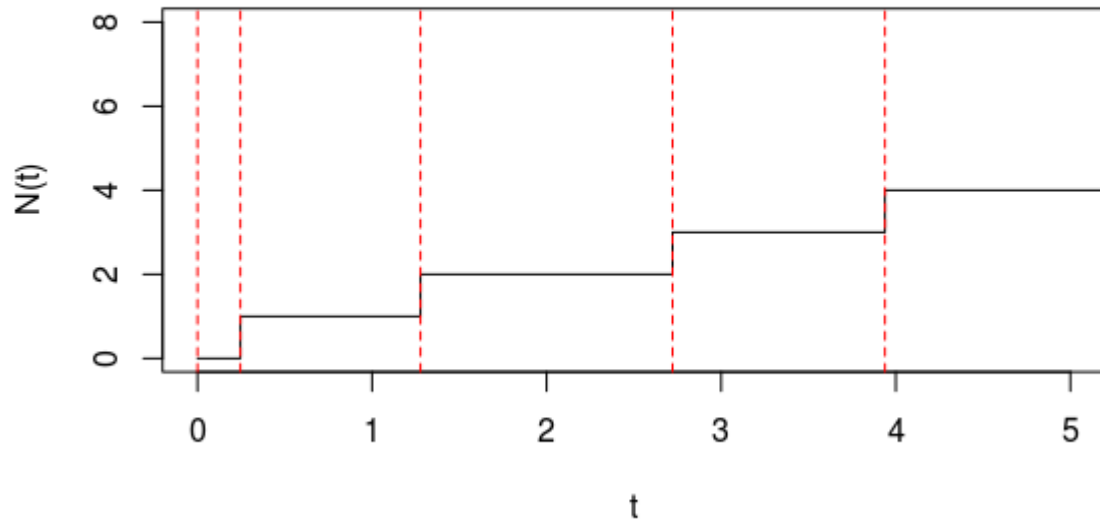
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Poisson Process

- Homogeneous

$$P\{X(t) = n\} = e^{-\lambda t} \frac{(\lambda t)^n}{n!} \quad n = 0, 1, 2, \dots$$

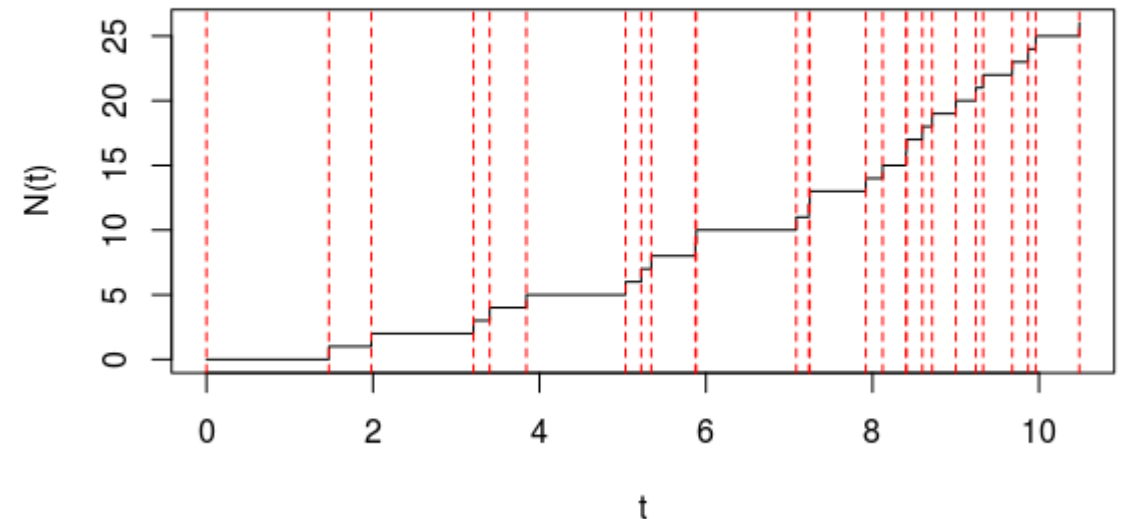
Homogeneous Poisson process with rate=1



- Inhomogeneous

$$P\{X(t) = n\} = e^{-\Lambda(t)} \frac{\{\Lambda(t)\}^n}{n!} \quad n = 0, 1, 2, \dots$$

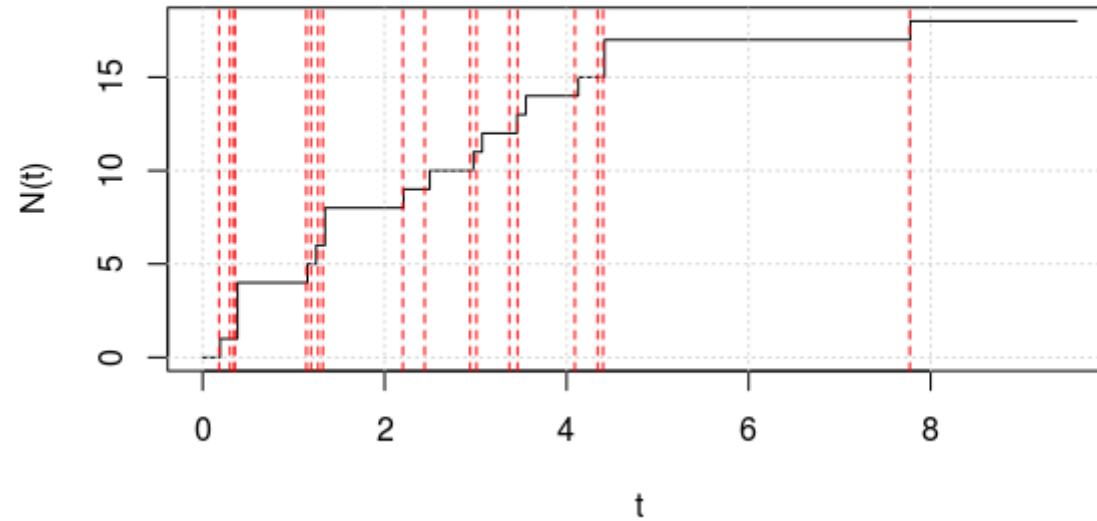
Inhomogeneous Poisson Process with rate=t/2



Hawkes Process (Thinning Procedure)

$$\Lambda(t) = \lambda_0 + \sum_{t_i < t} \alpha e^{-\beta(t-t_i)}$$

Hawkes Process, lambda = 1, alpha = 2, beta = 3



Thank you

Simulation of Hawkes Process

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<https://rstudio.cloud/spaces/4116/project/113564>