

Lecture 7: The Poisson Processes

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Handout 8

Related Reading

Bertsekas and Tsitsiklis Section 6.2

Definition and Properties

$$P(k, \tau) = \frac{\lambda^k \tau^k}{k!} e^{-\lambda \tau} \quad (1)$$

Nonoverlapping time sets are independent.

The interarrival time distribution is memoryless.

Interarrival Time Is Exponentially Distributed

$$f_T(t) = \lambda e^{-\lambda t} \quad (2)$$

The k th Arrival Time Follows Erlang Distribution

$$f_{Y_k}(y) = \frac{\lambda^k y^{k-1} e^{-\lambda y}}{(k-1)!} \quad (3)$$

Splitting and merging of Poisson processes result in Poisson processes