Probability with Engineering Applications
ECE 313 – Section C – Lecture 21

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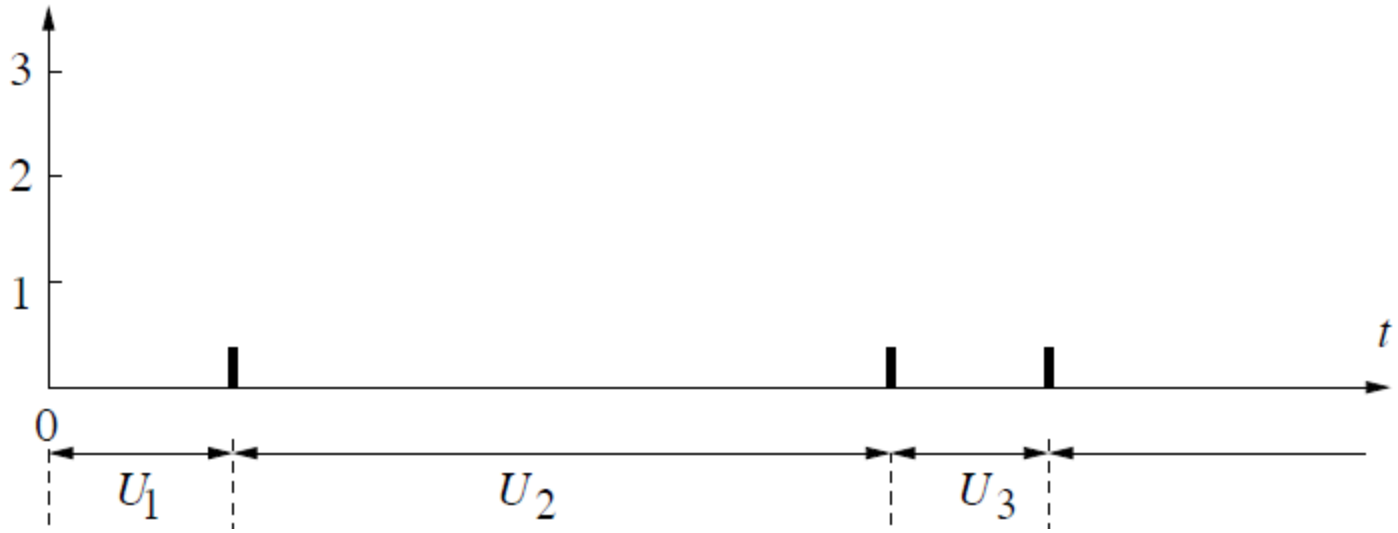
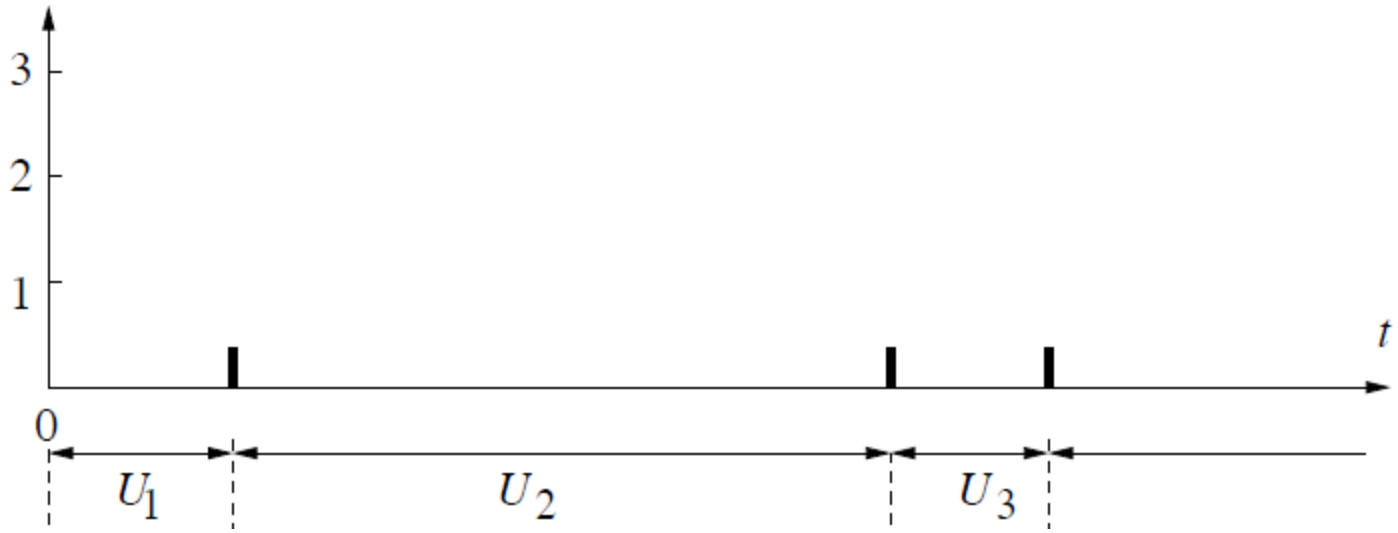
Poisson Process

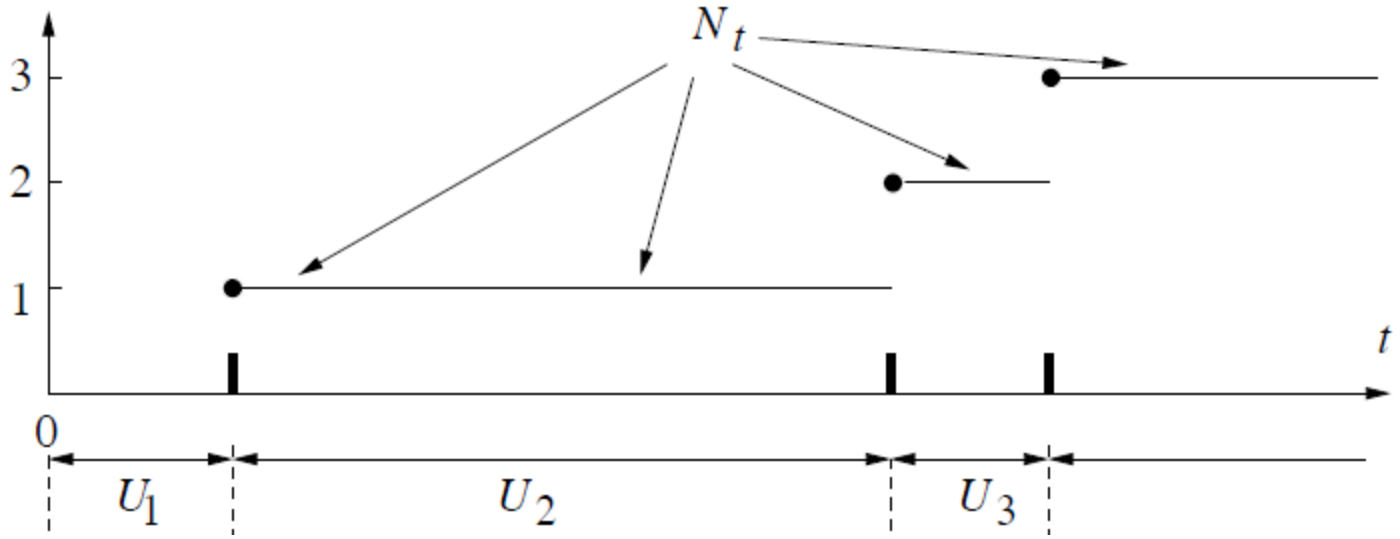


Poisson Process: Intercount Times



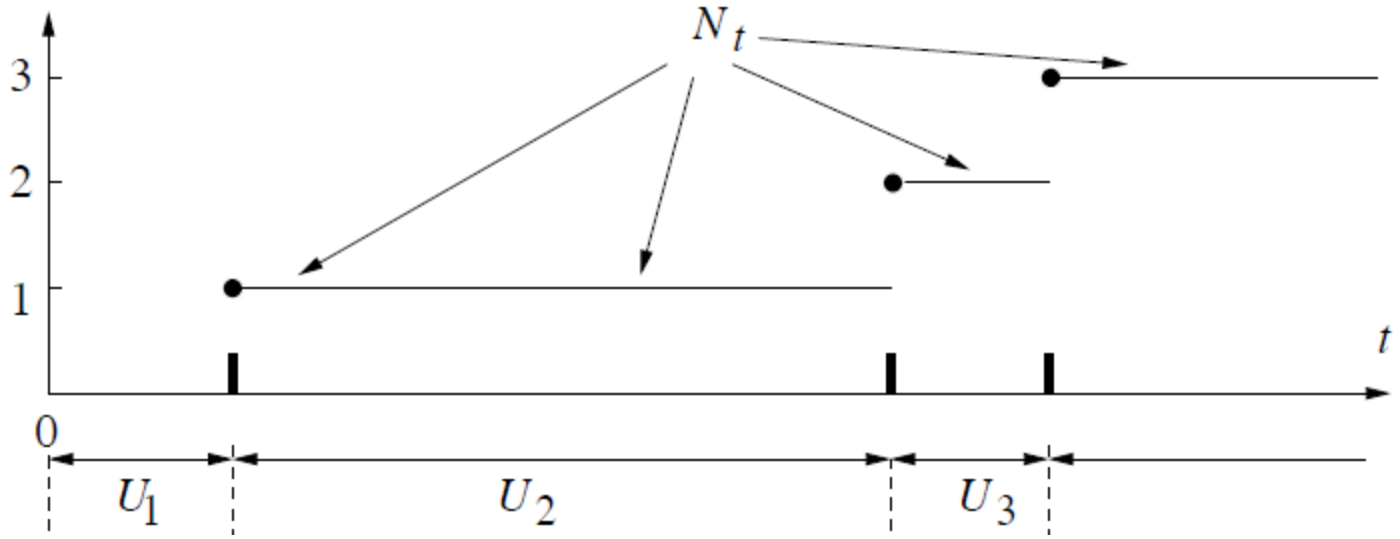
The intercount times $U_1, U_2, U_3, \ldots$ are mutually independent, exponentially distributed random variables with parameter λ

Poisson Process: Cumulative Counts



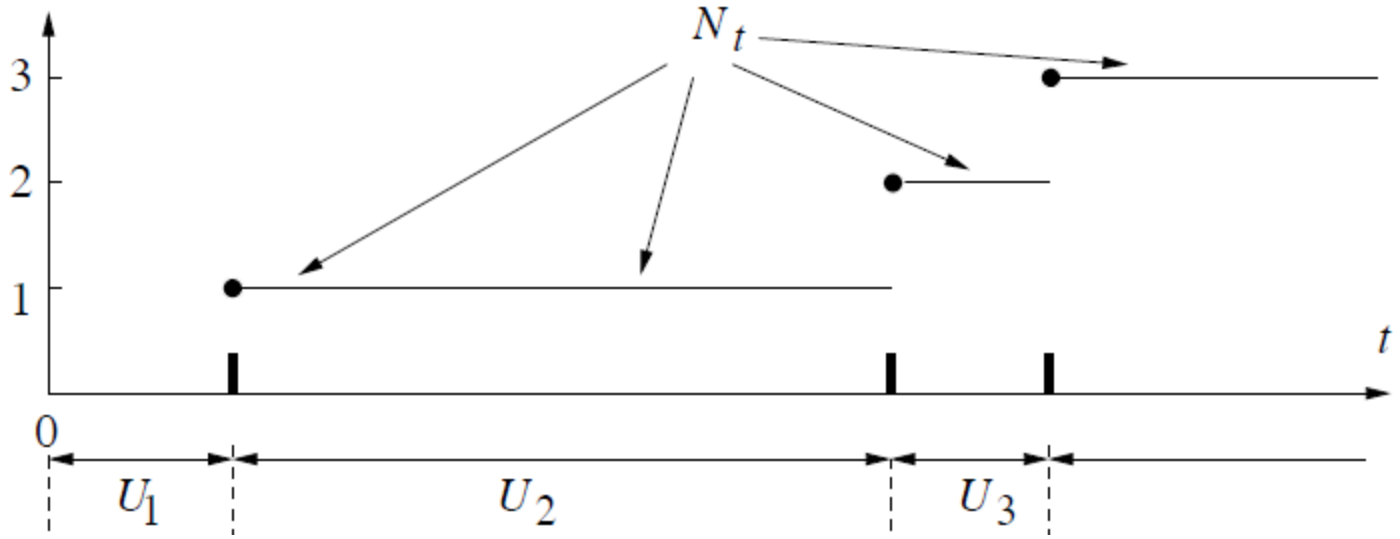
The variable N_t for each $t \geq 0$ is the cumulative number of counts up to time t

Poisson Process: Cumulative Counts



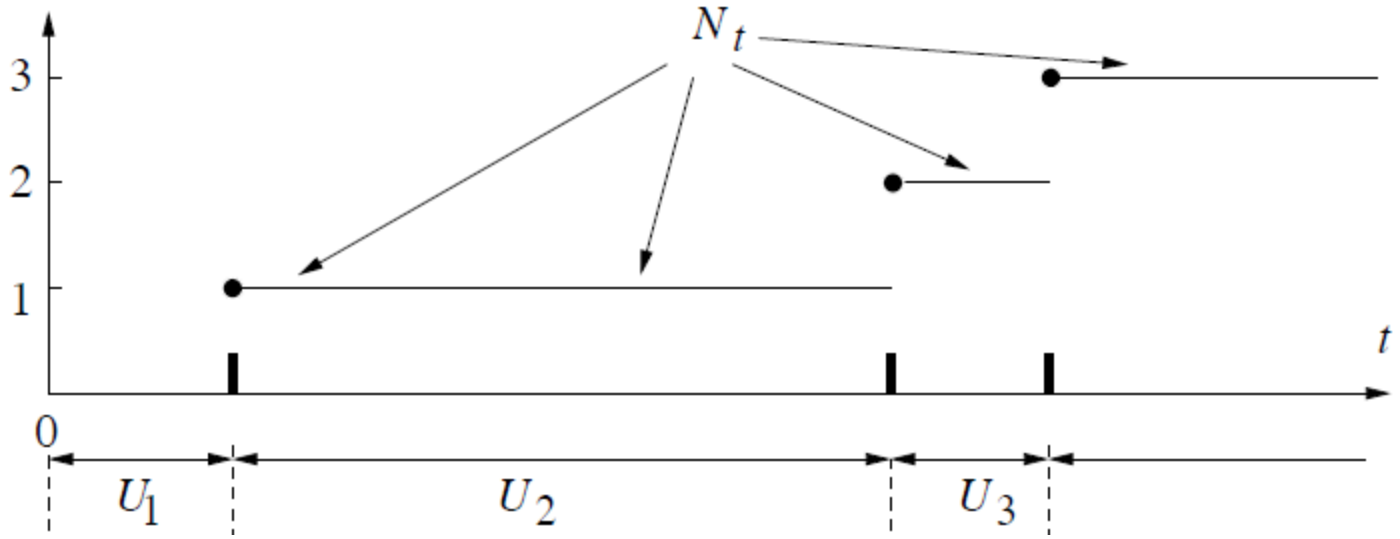
Independent increments: For $0 \leq t_0 \leq t_1 \leq \cdots \leq t_n$, the increments $N_{t_1} - N_{t_0}, N_{t_2} - N_{t_1}, \ldots, N_{t_n} - N_{t_{n-1}}$ are independent

Poisson Process: Cumulative Counts



Poisson increments: The increment $N_t - N_s$ has the Poisson distribution with parameter $\lambda(t-s)$ for $t \geq s$

Poisson Process: Cumulative Counts



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