

Shot Noise Processes

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A shot noise process is essentially a compound Poisson process whereby the arriving shots are allowed to accumulate or decay after their arrival via some preset shot (impulse response) function. Shot noise models see applications in diverse areas such as insurance, finance, hydrology, textile engineering, and electronics. This talk studies several statistical inference issues for shot noise processes. Under mild conditions, ergodicity is proven in that process sample paths satisfy a strong law of large numbers and central limit theorem. These results have application in storage modeling. Shot function parameter estimation from a data history observed on a discrete-time lattice is then explored. Optimal estimating functions are tractable when the shot function satisfies a so-called interval similar condition. Moment methods of estimation are easily applicable if the shot function is compactly supported and show good performance. In all cases, asymptotic normality of the proposed estimators is established.

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