NATURAL AND MODIFIED CONJUGATE PRIORS IN EXPONENTIAL FAMILIES OF STOCHASTIC PROCESSES

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Abstract: Modified conjugate families of prior distributions are investigated and their properties are examined in the context of applications to admissible and minimax estimation for the general exponential model for stochastic processes defined by (1). The conjugate priors are characterized as those which yield a linear admissible estimator under a weighted quadratic loss in a sequential statistical model. In Section 3, a new characterization of conjugate priors is presented which is relevant to the problem of finding minimax estimators in the statistical model that after a random time transformation cannot be reduced to a model for processes with stationary independent increments. Applications of the results obtained are presented in some special models, among others to a zero mean stationary Gaussian Markov process in the problem of estimating the variance parameter.

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