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Chapter 1 : Probability, Statistics, and Random Processes For Electrical

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Abstract â€" In this paper, a scheme for estimating frequencies and damping factors of multidimensional nuclear magnetic resonance NMR data is presented. The estimated frequencies and damping factors of The estimated frequencies and damping factors of multidimensional NMR data play important roles in determining protein structures. In this paper we present a high-resolution subspace method for estimating the parameters of NMR data. Unlike other methods, this algorithm makes full use of the rank-deficiency and Hankel properties of the prediction matrix composed of NMR data. Hence, it can estimate the signal parameters under low signal-to-noise ratio SNR by using a few data points. The effectiveness of the new algorithm is confirmed by computer simulations and it is tested by experimental data. Show Context Citation Context Low-dimensional approximations and error estimates for systems of linear random ODEs by J. Wunderlich , " The paper considers large-scale systems of linear ODEs with stationary random excitation terms. Approximations of the correlation and spectral density functions of the stationary solutions are found by means of model reduction techniques. To assess the approximation accuracy suitable error criterion To assess the approximation accuracy suitable error criterions are introduced and error estimates are given. Spectral factorization of a class of matrix-valued spectral densities by Hendra I. Nurdin , " Recently, a necessary and sufficient uniform log-integrability condition has been established for the canonical spectral factorization mapping to be sequentially continuous. However, this condition, along with several other equivalent conditions, is not straightforward to verify. In this paper, we f In this paper, we first derive a new set of easily checkable sufficient conditions which guarantee uniform log-integrability. Based on the newly derived conditions, we establish the existence of certain convergent rational approximations for a class of matrix-valued spectral densities. We then propose a new spectral factorization algorithm and provide convergence results. Our approach does not require the spectral density to be coercive. Numerical examples are given to illustrate the effectiveness and convergence of the proposed algorithm. In particular, we compute approximate spectral factors of the noncoercive and nonrational Kolmogorov and von Karman power spectra which arise in the study of turbulence. It may also prove to be useful in spectral estimation and system identification research. The author thanks the reviewers for their feedback, and the associate and corresponding ed Our analysis shows that, under a sufficient condition on the step size, the DPASTd algorithm is locally stable even though delayed updating is applied. A pipelined realization of the algorithm and the corresponding systolic architecture a A pipelined realization of the algorithm and the corresponding systolic architecture are also proposed and a method for reciprocal computation is discussed. We also present simulation results to validate the algorithm. The paper deals with the approximation of stationary random functions with a prescribed fractional rational spectral density. The approximations are found from stationary solutions of so-called form filter equations which are ODEs with an inhomogeneous term containing a given random function. Here, this random function is weakly correlated and ideas of form filter theory are combined with expansions of spectral densities of stationary solutions with respect to the correlation length. Further, the smoothing of derivatives of the approximated functions is considered. Some examples concerning modeling of random road and railway profiles are given. An important class of these functions is characterized by the property of weak or short range dependence of its values and known as weakly correlated functions. The mathematical theory of so-called weakly correlated random functions as w

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Intended to serve primarily as a first course on random processes for graduate-level engineering and science students, particularly those with an interest in the analysis and design of signals and systems.

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Discrete-time random processes are used to bridge the transition between random variables and continuous-time random processes. Additional material has been added to the second edition to provide a more substantial introduction to random processes.

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Probability and random processes are fundamental to communications, control, signal processing, and computer networks. Provides basic theory and important applications.

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probability, statistics, and random processes for electrical and computer racedaydvl.com complexity of the systems encountered in engineering practice calls for an understand- ing of probability concepts and a facility in the use of probability racedaydvl.com goal of the.