Title: NOTE ON ERROR BOUNDS FOR FUNCTION APPROXIMATION USING NONLINEAR NETWORKS
Author(s): Dingankar, Ajit T.; Sandberg, Irwin W.
Source: Proceedings of the 1997 40th Midwest Symposium on Circuits and Systems. Part 2 (of 2) Aug 3-6 1997 v 2 Sacramento, CA, USA. Sponsored by: IEEE Piscataway NJ USA. p 1248-1251 CODEN: MSCSDL
Publication Year: 1997
Abstract: For a variety of problems concerning classification, compensation, adaptivity, identification or signal processing, results concerning the representation and approximation of nonlinear functions can be of particular interest to engineers. Here we consider a large class of functions f that map Rn into the set of real or complex numbers, and we give bounds on the number of parameters needed so that f is approximated to within a prescribed degree of accuracy using a certain approximation network. Related work in the neural networks literature is also described. In English (Author abstract) 12 Refs. EI Order Number: 98054179593
Keywords: Signal theory; Function evaluation; Approximation theory; Set theory; Neural networks; Error analysis

Title: GENERALIZED TWO-DIMENSIONAL FREQUENCY DOMAIN LEAST SQUARE ALGORITHM FOR ARMA SYSTEM MODELING
Author(s): Zhang, Qingwen; Roman, Jaime R.; Davis, Dennis W.; Mikhael, Wasfy B.
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Abstract: The linear algorithm for two-dimensional least square approximation in the frequency domain (2D-FD-LS) is well-established and has been applied successfully to 2D signal representation and image noise cancellation. But it has some limitations. In this paper, a generalized version of the 2D-FD-LS algorithm is developed to overcome such limitations. The generalized version of the 2D-FD-LS algorithm includes extension to complex-valued data and extension to a more general model structure. In addition, a simple model order selection method is presented. An example for system modeling is given also to demonstrate proof-of-concept of the generalized 2D-FD-LS algorithm and the model order selection method. In English (Author abstract) 4 Refs. EI Order Number: 98054179522
Keywords: Digital signal processing; Frequency domain analysis; Least squares approximations; Algorithms; Mathematical models; Computer simulation

Title: OPTICAL SYSTEM MODELING FOR DIGITAL IMAGE RESTORATION
Author(s): Costello, Thomas P.; Mikhael, Wasfy B.
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Abstract: Defocused digital images may be effectively restored if the imaging system's Optical Transfer Function (OTF) is known. In this paper, Wiener filtering based on known OTFs is applied to noisy, defocused images to characterize the conditions for useful restoration for a range of noise and defocus levels. Restoration mean-square-error is measured over these ranges as a function of a constant noise/object power spectrum ratio in the Wiener filter equation. In English (Author abstract) 6 Refs. EI Order Number: 98054179515
Keywords: Image reconstruction; Optical systems; Optical transfer function; Signal filtering and prediction; Digital signal processing

Title: MAT2DSP - A MATLAB TOOL FOR RAPID FEEDBACK ON THE IMPLEMENTATION REQUIREMENTS OF SIGNAL PROCESSING ALGORITHMS
Author(s): Bose, S.; Friedlander, B.; Zeira, A.
Source: Proceedings of the 1997 40th Midwest Symposium on Circuits and Systems. Part 2 (of 2) Aug 3-6 1997 v 2 Sacramento, CA, USA. Sponsored by: IEEE Piscataway NJ USA. p 845-848 CODEN: MSCSDL
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Abstract: We introduce and describe MAT2DSP, a MATLAB toolbox, whose function is to estimate the computational load of algorithms specified in the form of a MATLAB program (or programs). This toolbox is aimed at providing researches developing advanced signal and image processing algorithms, a quick and convenient way of estimating the implementation requirements of their algorithm on a variety of processors. MAT2DSP analyzes the user program and generates reports on its computational requirements. In English (Author abstract) 4 Refs. EI Order Number: 98054179492
Keywords: Digital signal processing; Computer aided software engineering; Algorithms; Image processing; Computational methods

Title: MISMATCH CANCELLATION FOR COMPLEX BANDPASS SIGMA-DELTA MODULATORS
Author(s): Yu, Li; Snelgrove, Martin
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Publication Year: 1997
Abstract: The performance of complex sigma-delta A/Ds can suffer due to mismatches in the hardware as well as phase and gain errors introduced at the RF front-end. Improving the resulting SNR is essential. This paper presents a method that user DSP techniques to filter out the mismatch and the RF errors. Results of applying an adaptive complex LMS filter to a fourth-order bandpass sigma delta modulator are presented that show an improvement in SNR of 15 to approximately 20 dB. In English (Author abstract) 10 Refs. EI Order Number: 98054179485
Keywords: Modulators; Analog to digital conversion; Digital signal processing; Signal to noise ratio; Signal filtering and