

Abstracts of Papers from Other Journals

Resolution of Binary Signals for Threshold Detection in Narrowband Non-Gaussian Noise, A. M. Maras, H. D. Davidson, and A. G. J. Holt, *IEE Proceedings-F*, 132:187, June 1985.

The paper treats the resolution of binary signals in Middleton's class A narrowband non-Gaussian noise for both coherent and incoherent threshold or weak-signal detection. A specific relative cross-correlation coefficient ρ is defined for narrowband binary signals, and it is then shown that: (1) for coherent detection, antipodal ($\rho = -1$) signals are best, i.e., they give the smallest error probability P_e in the threshold regime, and (2) for incoherent detection, orthogonal ($\rho = 0$) signals are best. Threshold performance (P_e) is a monotonic function of NSL , where N is the number of large (independent) data samples, S is the normalized signal-to-noise ratio, and L is Fisher's information measure for the noise statistics.

Modelling of Packet-Switching Networks with Nodal Blocking, A. J. Kozlowski and N. D. Georganas, *IEE Proceedings-F*, 132:193, June 1985.

A packet-switching network with both end-to-end and local flow-control mechanisms is considered. End-to-end control is accomplished by window flow control and local control by using buffer management schemes between the input and transit traffic at the nodes. A queueing model of a semi-closed network is developed, which includes blocking models for the flow-control mechanisms and still retains a product form for the equilibrium distribution. Analytical expressions for network-performance measures are given and the effects of different buffer management schemes on these measures are studied using numerical techniques.

Development of an Error-Correcting Method for Coded Transmission Teletext, Osamu Yamada, Akio Yanagimachi, and Tadashi Isobe, *NHK Technical Journal*, 37:38, May 1985.

This paper describes a newly developed error-correcting system for coded transmission teletext in Japan. The television transmission path, impaired by random noise, impulsive noise, ghost interference, and waveform distortion, is one of the worst in quality among digital systems that have been put to practical use. Based on data of bit-error occurrences collected in field tests, the authors derived empirical equations and simulated the ability of many types of error-correcting codes. Some problems in the application to a

teletext system were discovered. These error-correcting codes were compared and discussed with overall consideration of the many system restrictions.

The result shows that the majority logic decodable (272, 190) shortened difference-set cyclic code, whose error-correcting ability is up to 8 bits in a packet (272 bits), is the best for coded transmission teletext. It was confirmed that the page-error can be less than 10^{-2} on average even under the condition of a bit-error rate of 10^{-2} . It became evident that this coding system has an effective correcting ability against bit-errors of up to 9 bits/packet instead of 8 bits, and that a contrived decoding circuit enables the system to correct bit-errors of up to 11 bits/packet. One chip IC of this decoding circuit required for a set of receivers has been developed.

Catching up with LAN Components, Steven S. Lympny, *Photonics Spectra*, 19:82, October 1985.

More and more, computer communications, local area networks (LANs), data processing, and CATV are taking advantage of fiber optics for the transmission of communications signals. With the opening of these markets comes the need for suppliers to offer a wide range of products to cover the various system needs. The required components for fiber-optic implementation include high-speed data links, optical couplers, star couplers, WDM couplers, optical switches, and connectors. Taking the stance that fiber-optic technology can meet the requirements for current and future LAN systems, the author offers a comprehensive look at the components involved.

Predicting Graininess from Granularity, C. J. Bartleson, *The Journal of Photographic Science*, 33:117, July/August 1985.

Psychophysical relationships were determined between visual granularity and both intervals and ratios of graininess. Visual granularity can be calculated as the vector sum of appropriately weighted ISO Status A red, green, and blue granularities. Appropriate, unequal weightings are those that provide highest correlation with visual contrast sensitivity as a function of wavelength, which implies that graininess is a singular form of contrast perception regardless of the chromaticity of a sample. Intervals of graininess were found to be linearly related to logarithms of visual granularity and ratios of graininess were

found to be a power function, with an exponent of two, of visual granularity. Graininess intervals are then linearly related to logarithms of graininess ratios.

A convenient logarithmic relationship is one that uses the dyadic (or binary) base to define graininess "bits." The unit of the graininess bit scale corresponds to a factor of two in graininess ratios. Because the exponent of the psychophysical function relating visual granularity to graininess ratios is two, a factor of two in granularity is represented by two units on the scale of graininess bits, which corresponds to a factor of four in ratios of graininess.

Review of the Factors Relating to Photographic Sensitivity, Harry E. Roberts, *Journal of Imaging Science*, 29:175, September/October 1985.

The principles relating to the photographic sensitivity of chemically and spectrally sensitized silver halide emulsions are reviewed. The factors affecting the sensitivity of direct-positive emulsions are discussed, as well as the optical effects associated with the sensitivity of black-and-white and color photographic materials.

A Three Channel Solid State Sound Store, Peter Smith, *The BKSTS Journal*, 67:526, September 1985.

Until now, the accepted methods of recording sound have always involved moving parts (i.e., revolving disc, magnetic tape). Now it is possible to think in terms of "solid state" sound recording, where sounds can be recorded directly into EPROMs. The result is a playback system that has no moving parts. This technical realization is now possible, due to the considerable packing densities of EPROMs.

Audiovisual Trends in Europe, H. Lhoest, *EBU Review*, 211:122, June 1985.

The paper focuses on current trends in European audiovisual media and discusses some aspects of the development of broadcasting. The author asserts that the audiovisual media in Europe are organized around three main poles or meeting places for developments which are both opposed and complementary: regional and local decentralization/internationalization, diversification/concentration, and commercialization/public service or general interest. The paper looks at a few examples of these paradoxical trends which are quite inseparable, each deriving support from its counterpart.