Practical Equalizer for a Perpendicular Magnetic Disk

IEEE Trans. Magnetics, Vol. 38, No. 6, pp. 3684-3688, November 2002
Kiyohiko Ishikawa, Masahiko Kishida, Koji Kamijo, Ryo Taguchi Haruo Okuda, and Junji Numazawa

A readback equalizer has been developed for a perpendicular magnetic disk with a commercial anisotropic magnetoresistive head for use with a PR4ML read channel with 8-9 coding. The transfer function of the perpendicular magnetic disk, derived by Fourier analysis, has a phase lag of 90fl from that of the longitudinal magnetic disk. The paper defines the parameters of the equalizer by simulation. The equalized readback signal nearly satisfied Nyquist's first criterion. Using resistor-capacitor circuits that correspond to the simulated function, a byte-error rate of below 10-7 is obtained. Comparing the effect of incorporating PR4 or PR1 as part of the equalizer, it is observed that PR4 gave a lower bit-error rate than PR1. Thus, PR4 is an effective detection method for a perpendicular magnetic disk. It is suitable not only for longitudinal magnetic disks, but also for perpendicular magnetic disks.

Region Support DCT (RS-DCT) for Coding of Arbitrarily Shaped Texture

IEEE Trans. Circuits and Systems for Video Technology, Vol. 12, No. 5, pp. 320-330, May 2002
Yoshiaki Shishikui and Shinichi Sakaida

Object-based coding is a promising technique for next-generation coding.

In object-based coding, objects are extracted by analyzing a video sequence, after which each object's contour and texture are coded, respectively. The coding scheme for texture within an arbitrarily shaped region is key to implementing object-based coding, because an object generally has an arbitrary shape.

This paper proposes a new technique, called the "Region Support DCT," for arbitrarily shaped texture coding. The Region Support DCT provides excellent coding performance and has low computational complexity, especially in the decoder. The encoding process is based on conventional two-dimensional DCT and has a feature that the decoding process is achieved with the conventional DCT process.

Fundamental Display Properties of Flexible Devices Containing Polymer-Stabilized Ferroelectric Liquid Crystal between Plastic Substrates

Optical Engineering, Vol. 41 No. 9, pp. 2195-2201, September 2002
Hideo Fujikake, Takeshi Murashige, Hiroto Sato, Yoshiki Iino, Masahiro Kawakita, and Hiroshi Kikuchi

Several fundamental display properties are described of a flexible ferroelectric liquid crystal device containing polymer fibers between thin plastic substrates. The composite film of liquid crystal and polymer was created from a solution of liquid crystal and monomer materials between the plastic substrates under ultraviolet light irradiation. The dynamic electro-optic response to analog voltage pulses was examined with an incidence of laser beam light, and its light modulation property exhibited good linearity with a continuous gray-scale capability. The excellent spatial uniformity of liquid crystal alignment formed between the flexible substrates resulted in high-contrast light modulation, although a slight spontaneous bending of liquid crystal alignment in the device plane was recognized. When the laser light beam was obliquely incident on the flexible display device, the measured transmittance revealed that the device has a wide viewing angle of more than 100 deg without contrast reversal. This is considered to be caused by the molecular switching in the device plane and the thin electro-optic layer in the display device.