Introduction

One of the pleasures of our responsibilities as the chairs of the Technical Program Committee for the 2001 Canadian Conference on Electrical and Computer Engineering was to oversee the judging for the Student Paper Competition. Twenty-two papers were received from not only across Canada, but such countries as China, Italy, Japan, and the United States. To be eligible for the Student Paper Competition, the first author of a paper must be a student.

After some very difficult deliberations, the committee made the following decision: The first paper certificate was awarded to Xavier N. Fernando for "Nonlinear channel estimation using correlation properties of PN sequences," by Xavier N. Fernando and Abu B. Sesay of TRLabs and the University of Calgary. The second paper certificate was awarded to Shin-Ichi Kadono for "Encoding of colour still pictures by wavelet transform and vector quantization" by Shin-Ichi Kadono, Osamu Tahara and Noriyoshi Okamoto of Kanto Gakuin University, Japan. And the third student paper award winner was Yunan Xiang for "Design of a multilevel DRAM with adjustable cell capacity" by Yunan Xiang, Bruce F. Cockburn and Duncan G. Elliott of the University of Alberta.

On Tuesday, May 15, 2001, in the Churchill banquet room of the Delta Chelsea Hotel in downtown Toronto, a special student awards luncheon honoured the best student papers of the conference. The guest speaker, Dr. Doug Barber of Gennum Corporation, inspired the students and delegates with a keynote speech on "Living and working in a knowledge-based economy." Dr. Barber discussed the evolution of civilization and the engineers' contributions and emphasized the future role of engineers in the present knowledge-based economy. At the end of his talk, Dr. Barber awarded the paper prize certificates to the best three student papers judged by the Technical Program Committee.

The first prize paper, "Nonlinear channel estimation using correlation properties of PN sequences" (retitled "Fibre-wireless channel estimation using correlation properties of PN sequences" in this issue), is concerned with distortion problems for radio-over-fibre communication systems. Such distortion unfortunately has nonlinear components due to the electrical-to-optical conversion process. To model the nonlinear channel, the authors propose a Vandermonde matrix approach to separate the Volterra kernels of the nonlinear model, eliminating the computation of higher-order correlations. Correlation properties of pseudonoise (PN) sequences are used to estimate the channel transfer function. In simulations, the algorithm for finding the function works efficiently and independently of the shape of the nonlinearity as long as a sufficient number of points are used.

The second paper, "Encoding of colour still pictures by wavelet transform and vector quantization," presents a novel method of encoding digital colour images using a three-level wavelet decomposition. The authors propose an extension to the standard zero-tree approach of encoding the wavelet coefficients by incorporating a five-dimensional vector quantization of the remaining nonzero coefficients. In simulation results the increased efficiency of the vector quantization results in improved compression of 5–8% for the same distortion over the standard JPEG method.

The third paper, "Design of a multilevel DRAM with adjustable cell capacity," presents research into multilevel memory cells. In standard memory cells, data are represented in binary format: either "on" or "off." In a multilevel cell, increased bit capacity can be achieved by allowing multiple states through multiple voltage levels per cell. The authors present a system where the number of levels per cell can be varied. The test chip can store 1, 1.5, 2, and 2.5 bits per cell. Simulation results in this paper show the feasibility of this scheme. Further, the chip will be useful for continued research into this concept.

Bob Dony
Kostas Plataniotis
Co-Chairs, CCECE 2001 Technical Program Committee

Errata

Corrections to "On the design of CMOS current conveyors"

Ivars G. Finvers, Brent J. Maundy, Ibiyemi A. Omole, and Peter Aronhime

In the paper listed below [1], the current conveyor formed from the operational amplifier was incorrectly reported as CCII–. It should be a CCII+, and equations (4), (5), and (6) should have the minus (–) sign immediately after the equal sign removed.

[1] I. Finvers, B. Maundy, I. Omole, and P. Aronhime, "On the design of CMOS current conveyors," *Can. J. Elect. & Comp. Eng.*, vol. 26, no. 1, pp. 35–40, Jan. 2001.