



# CpE Circuit Board

A newsletter of the  
Department of Computer Engineering  
University of Minnesota - Duluth

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Spring/Summer 1992

## IEEE NEWS

IEEE Officers for 1992 have been elected. They are: Kevin Dehmer, Chair; Wade VanGuilder, Vice Chair; Eric Wetterlind, Secretary; Scott Oswald, Treasurer.

IEEE - Student Professional Awareness Conference was held Tuesday, March 17, 1992, in Kirby Ballroom. Featured speakers were Alicja Ellis, Honeywell; John Pappas, Chair of the National Engineering Consortium; Marlin Ristenbatt, University of Michigan; and William Middleton, Past Chair of the IEEE/USE Ethics Committee. S-PAC gives students the opportunity to hear from professional engineers, currently working in industry, about such topics as career planning, ethics, public awareness and political insight, and career enhancement and professional involvement. About fifty students, faculty, and staff attended this year's event.

The IEEE Student Paper Contest, Honorable Mention Award was given to Spring '92 graduate, Robert Walker, at the IEEE Awards Banquet held April 4, 1992 in Minneapolis. Bob has been working with Professor Marian Stachowicz, on "Determination of Discontinuities of Hole Drilling Using Fuzzy Logic".

## DEPARTMENT NEWS

Dean's List for Academic Excellence, Winter Quarter '92: Jonathan Andersh, Duane Averill, Lance Beall,

Christopher Bernard, Dan Blezek, Scott Brown, Eric Carlson, Jian Chen, David Dau, Kenneth Erickson, Kris Forsline, Bin Fu, Rhonda Goenner, Todd Goepferd, Laura Gose, Russell Grensing, Michael Hafften; Jody Hermann, Kevin Hilman, Rebecca Ingemansen, Bradley Johnson, Nels Johnson, Brian Kleiber, John Liptak, John Long, Matthew Mahr, Mark Nelson, James Pichler, Timothy Schaeffer, Andrew Thomas, Dean Tyo, Wade VanGuilder, Eric Wetterlind, Colette White, Chaohui Yang.

The following CpE Students were awarded UROP Grants for Spring Quarter '92: Chaohui Yang, working with Assistant Professor Philip Cheung on "Numerical Simulation of Electro-optic Functions for Photo-reflectance Research"; Jian Chen, working with Assistant Professor Philip Cheung on "Calculation of Transverse Electric Fields for Electro-optic Function"; and Robert Walker, working with Professor Marian Stachowicz, on "Determination of Discontinuities of Hole Drilling Using Fuzzy Logic".

Engineering Honor Society - A new engineering honor society, Upsilon Mu Delta, initiated its first group of members on April 24. CpE members are: Jon Andersh, Jeff Caron, Dave Dau, Kris Forsline, Jody Hermann, Ron Pietila, Wade VanGuilder, and Eric Wetterlind. Congratulate these folks when you see them!

Upsilon Mu Delta emulates the national engineering honor society,



Tau Beta Pi, and will become a Tau Beta Pi chapter after a two-year developmental period. The society recognizes engineering students who display distinguished scholarship and exemplary character. Officers and advisors of the new society are: President, Loren Mueller (IE); Vice President, Wade VanGuilder (CpE); Recording Secretary, Brian Whipps (ChE); Corresponding Secretary, Kris Forsline (CpE); Cataloger, Jonathan Andersh (CpE); Advisory Board: Dorab Baria (ChE), Christopher Carroll (CpE), David Wyrick (IE).

**Congratulations Class of 1992!** - The department hosted an informal gathering on Thursday, May 14, from 11:30 a.m. to 1:00 p.m., in 279 MWAH. A lunch consisting of pizza, veggies, and a congratulatory cake was available to all who attended, along with our very best wishes for our departing seniors!

**Spring '92 Graduates** - Those students graduating this spring are: Duane Averill, Brad Bremer, Jeff Caron, Scott Christenson, David Dau, Chris Gess, John Liptak, Kent Rahne, Jim Pichler, Ron Pietila, and Robert Walker. Congratulations to all!

**Summer Internships** - Jon Andersh will be working with Control Data this summer in the field of intelligent systems.

**Department Bulletin Board** - Current students are reminded to check frequently the department bulletin board (across from the department office). The latest information regarding course offerings and other important information is posted there for you.

**Summer Hours** - No formal classes will be offered during the summer this year, but students can register for senior projects or independent study courses. (When you register, you'll need an override slip [which you may obtain in the department office] signed by the faculty member with whom you plan to work).

Office hours from May 26 to August 31 are: 8 a.m. to 12 Noon; 1 p.m. to 3 p.m. Please remember that summer hours are flexible; if you're making a special trip to the office, please call first to make sure someone will be here to assist you.

**Short Course** - Associate Professor **Chris Carroll** and Assistant Professor **Taek Kwon** are offering a short course this summer entitled "Microcontrollers and Their applications". The course will be offered August 17-21 1992.

**New Courses** - Three new elective courses will be offered beginning fall '92. They are:

**CpE 3130, Fuzzy Set Theory and its Applications.** This three-credit course was developed by Jack Rowe Professor Dr. **Marian Stachowicz**, and discusses fuzzy set theory applications in management science, economics, medicine, artificial intelligence, computer science, operations research, and robotics. Its applications are becoming increasingly widespread; in 1991, 8000 papers were published on fuzzy set theory and its applications. Patents totalling up to 2000 have been filed in Japan alone during the last few years. Understanding fuzzy theory may well give one the added edge they need in today's job market.

**CpE 5310, Design of Very Large Scale Integrated Circuits.** This is a four-credit course (with lab), developed by Associate Professor Dr. **Chris Carroll**, which deals with the techniques and philosophy of designing VLSI circuits in nMOS and CMOS technology. Full-custom design techniques and semi-custom techniques will be discussed for comparison, as well as digital, analog, and hybrid MOS circuits and systems. The course involves the completion of a substantial design project, and will be offered for the first time in Spring '93.



**CpE 5800, Introduction to Artificial Neural Networks.** This three-credit course, dealing with definitions and models of neural networks, was developed by Assistant Professor Dr. Taek Kwon. Other topics that will be discussed are the Hopfield network and its variants, perceptron based networks, multi-layers networks, error correction algorithms, and associative memories.

**New Labs** - We added a new laboratory in VLSI (Very Large Scale Integrated Systems) which has four Sun SparcStations networked to the CpE server. Students will be able to design VLSI products using Mentor Graphics software. This software was donated by Mentor Graphics and is valued at \$526,150. It was obtained through the efforts of Dr. Marek Patrya in a proposal to Mentor Graphics.

We've also added a laboratory in LIS (Laboratory for Intelligent Systems). This lab consists of two Macintosh FX computers with Think C, Think-Pascal, and AdobePhotoshop. In addition, there is LabVIEW software, a high resolution laserwriter to print out the images, and a Sun-2 SparcStation. This lab will be used for Fuzzy Set Theory, AI programming, and image processing.

**EIT Exam** - The next Engineering in Training Exam (EIT) will be given October 31, 1992. Deadline for application is August 1, 1992, and the fee is \$40; forms are available in the CSE Student Affairs Office, 140 Engr. Bldg. (or from The Board of Architecture, Engr., Land Surveying and Landscape Architecture, 133 -7th St. E., St. Paul, MN 55101-2333, 612-296-2388). Review sessions will be scheduled only if a minimum of 18 people sign up; cost will be \$130 (does not include manuals). If interested in the review sessions, contact Dr. Dorab Baria, 221 Engr. Bldg., 218-726-6154 as soon as possible.

**CpE Gifts** - A number of our graduates

have assisted the department in continuing to meet its educational goals by contributing to the department gift fund. If you would like to assist us in our efforts to continue to grow and maintain our high academic standards, you may make a contribution at any time to the Development Office, 315 Darland Administration Building, UMD, 10 University Drive, Duluth, MN 55812, earmarked "CpE Gift Fund".

#### **FACULTY NEWS**

Dr. Chris Carroll, associate professor, has been appointed Assistant Department Head as of February 1992. During February, he organized and hosted local reception of a national teleconference titled "Discover Engineering", viewed by more than 50 Duluth high school students at UMD. Dr. Carroll will be attending the 1992 ASEE Annual Conference in Toledo, Ohio, in June; He will present two papers: "Automated IC Component Testing Using LabVIEW", and "A One-Instruction Computer: Architecture, Implementation and Experiments".

Dr. Nazmi Shehadeh, professor and department head, recently attended two seminars. On March 13-14, he was in Chicago at the Bellocore "Forum on Information Networking"; April 28-30, he attended a presentation in Racine, Wisconsin, entitled "Advancing the Use of Corporate and Government Engineers and Scientists in the University" sponsored by the Technology Based Engineering Consortium.

Dr. Shehadeh left for Malaysia on May 19, where he will be teaching this summer in the ITM-MUCIA/Indiana University Cooperative program. For eight weeks, he will teach "Numerical Methods for Engineers", after which he plans a trip to the Mid-East to visit his family.

Dr. Marian Stachowicz, Jack Rowe professor, recently presented two seminars: "Fuzzy Sets and Intelligent Control", for the Student IEEE



Computer Society, on February 5, and "Introduction to Fuzzy Sets", a computer science colloquium on February 11. With the help of Dr. Marek Patrya, Dr. Stachowicz also presented the short course "Fuzzy Sets and Intelligent Control" (along with Jamos Grantner of the EE department at the Twin Cities campus), for 3M on February 13. This short course was attended by fifty 3M researchers and process engineers, and received an excellent evaluation.

Dr. Stachowicz has the following refereed papers to his credit during the past year: "A Hardware Accelerator for Linguistic Data Processing", "Pipelined Processing of Linguistic Data", and "Pipelined Architecture Boosts Performance of Fuzzy Logic Controller".

Dr. Clark Thomborson, professor, will be on sabbatical from UMD next year, serving as Visiting Professor of Electrical Engineering and Computer Science at Massachusetts Institute of Technology (MIT) from September '92 to May '93, working with Professor Charles Leiserson in the Dataflow group. During the fall term he will help teach MIT's sophomore-level course, 6.004, on Computation Structures. During the spring term, Dr. Thomborson hopes to run a seminar on the Theory of Parallel and VLSI computation.

During this past year, Dr. Thomborson has the following items to his credit. Articles in Refereed Journals: "The V.42bis Standard for Data-Compressing Modems" and "Delay Optimization of Carry-Skip Adders and Block Carry-Lookahead Adders"; Article in Conference Proceedings: "Gate Array Global Routing Using a Neural Network"; Patent Disclosures: "Algorithms to Configure Block Lookahead Adders" and "Block Carry Lookahead Adder"; Software Release: "Mrandom: A Random Number Generator with Persistent State"; Technical Report and Conference Presentation:

"Rectilinear Steiner Tree Minimization on a Workstation"; Professional Service: Chaired an oral session at the National Conference for Undergraduate Research; Federal Grants Administered: Algorithms for VLSI (NSF).

Dr. Roger Yiwen Wang, assistant professor, will be presenting a paper "A Computing System of (Modular) Chips", at the 1992 International Joint Conference on Neural Networks, June 7-11, 1992, in Baltimore, MD. Another paper, "Custom Analog VLSI Neural Chips with Digital On-Chip Learning for Pattern/Character Recognition", will be published in the Proceedings of the 2nd International Conference on Fuzzy Logic and Neural Networks, Iizuka, Japan, July 17-22, 1992

Dr. Jiann-Shiou Yang, assistant professor, presented a paper entitled "On Output Frequency-Weighted Controller Reduction" at the 1991 IEEE Conference on Decision and Control in Brighton, England in December. He received a grant from IEEE Control Systems Society to support this travel. Dr. Yang will present another paper, "Design of Sampled-Data Control Systems with One Memoryless, Time-Invariant Nonlinearity Using QFT Technique" to the 1992 American Control Conference to be held in Chicago in June. He was awarded a 1992 Grant-in-Aid from the University of Minnesota Graduate School to support his research on "Locomotion Control for a Three-Link Biped". Dr. Yang has submitted two papers, co-authored by CpE spring graduate Ron Pietila, entitled "A Parameter Space Method for the PID Control of a Chemical Reactor System with a Transportation Lag" and "A Parameter Plane Method for the PID Control of a Multirate, Sampled-Data Chemical Reactor System with a Transportation Lag" to Chemical Engineering Science and Chemical Engineering Communications respectively.

Dr. Michael Zervakis, assistant



professor, co-authored the paper "Iterative Least Squares Estimators in Nonlinear Image Restoration" with A. Venetsanopoulos, which was published in the April '92 issue of Transactions on Signal Processing. Two additional papers are in press: "Design of a New Restoration Algorithm Based on the Constrained Mean-Square-Error Criterion", co-authored with Venetsanopoulos, and "Robust Estimation Techniques in Regularized Image Restoration", co-authored with CpE assistant professor Dr. Taek Kwon. Dr. Zervakis attended the SPIE Conference on Image Processing Algorithms and Techniques III, where he presented the paper "Edge-Preserving Image Restoration Based on Robust Stabilizing Functionals". He will attend the 1992 ASEE Annual Conference on Computers in Education, where the paper "Adaptive Filter Design and Implementation Using the TMS320C25 Microprocessor" will be presented. This paper was co-authored by CpE professor Dr. Nazmi Shehadeh and CpE graduate Curt Peterson.

ALUMNI NEWS

Graduate Job Placement - Fall - '91-  
**Michele Bertrand**, U.S. West, Minneapolis; **Chris Guianunzio**, Control Data, Minneapolis; **Gary Williams**, University of Minnesota-Twin Cities.  
Winter '92- **Duane Bourget**, software engineer, Medtronics, Minneapolis; **Scott Brown**, computer systems engineer, Elgin Air Force Base, Florida; **Philip Fleege**, E-Systems; **Russell Gensing**, software engineer, Control Data; **Kent Kingsley**, system administrator, Analysts International Corporation in Rochester (a subdivision of IBM); **Matt Plante**, Control Data.

Graduate School - Rajiv Sharma (Fall '89) received his MBA at the University of Colorado, Denver, in December '91. Congratulations Rajiv!

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WE WOULD BE DELIGHTED TO HEAR FROM YOU and in particular ask you to let us know:

News of yourself \_\_\_\_\_

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Employment/Change in Employment \_\_\_\_\_

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Graduate School \_\_\_\_\_ Degree \_\_\_\_\_ Year \_\_\_\_\_

Name \_\_\_\_\_ Address \_\_\_\_\_

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Please send the above to: Dept. of Computer Engr., 271 MWAH, UMD, 10 University Drive, Duluth, MN 58122, ATTN: Circuit Board



Diane Ebro  
UMD Library