Chair’s Corner

On July 18, 1997, I was appointed to the position of Interim Chair of the largest department at the University of Alabama in Huntsville, the Electrical and Computer Engineering department. I accepted this highly responsible and challenging position with one goal in mind, "to provide our customers (local and national industry) with premier quality products (our graduates)." I am optimistic that this goal can be reached during the coming year. My optimism is fueled by the caliber of our students and by the dedicated staff, faculty, and leadership of the ECE department who have already contributed greatly toward building a strong quality foundation.

To attain this goal, the ECE Department will re-evaluate its curriculum, instructional tools, classroom and laboratory facilities, professor-student relationships, and methods of teaching and research. The curriculum will be enhanced by including additional new courses. Laboratory equipment will be updated with state-of-the-art hardware and software. Teaching techniques for effectively communicating concepts to students will be incorporated into the classroom and into professor-student relationships. Research programs will be geared toward securing our nation's technological leadership.

During my 15 years of teaching and research experience, I have characterized an excellent professor as someone who knows the subject matter (a scholar), knows the art of communications (an artist), and can perceive the effectiveness of his/her lecture through the facial expressions of the audience (a psychologist). I am committed to seeing the ECE department reach its quality potential and will not compromise that commitment. I ask students and industry to please join with me and the ECE department in our quest for quality, by sharing with us your observations and recommendations.

In the next few issues of Real Time, I will provide you with insight into the impact of technology in the class-rooms of tomorrow as we enter the 21st century.

From the Dean

This is a year of unprecedented stress for the College of Engineering. We have the relocation to Technology Hall of Industrial and Systems Engineering and Engineering Management, Mechanical and Aerospace Engineering, Civil and Environmental Engineering, as well as the Computer Science Department. In addition, computer engineering faculty will move selected research and graduate instruction there. Once this move is accomplished, hopefully in December, we expect to begin renovations of the Engineering Building, permitting Chemical and Materials Engineering to move its departmental and faculty offices here from the Material Science Building, along with Career Services and Cooperative Education which will be coming from the University Center. The Dean’s Office and the ECE Department will be able to expand offices and laboratory facilities. All in all, the College will obtain almost 100,000 sq. ft. of excellent new space.

Then there is our impending accreditation visit from ABET, searches for faculty, as well as for dean, chair of Mechanical and Aerospace Engineering, chair of Electrical and Computer Engineering, and Eminent Scholar in Industrial and Systems Engineering.

But my most important initiative this year will be to improve our relationship with the Huntsville technical community. Ultimately our success in filling up all that beautiful space with outstanding faculty, state-of-the-art equipment, and excellent students, depends on our meeting the educational needs of this community. Without their support, we won't have the political clout or financial backing to build this College. So I intend to concentrate on finding out where Huntsville wants to go, so that our College can take the steps necessary to provide the graduates who can help build a world-class technology center here. I will be meeting with senior technical and management people, discussing their plans and needs, and inviting them to visit UAH to see the
Algorithmic Thinking
By R. Adhami

Integrals of the form \( \int u dv \) can be solved using the following relationship

\[
\int u dv = uv - \int v du + \text{constant}
\]

For example to integrate \( \int x^2 e^{2x} dx \), first we choose \( u \) and \( dv \). There is more than one choice for \( dv, u \). You guessed it, this is where the confusion starts. What do we assign to \( u \) and \( dv \)? Well, you don’t have to worry about it if you consider using the following efficient step-by-step procedure (algorithm).

Algorithmic Approach:

Generally speaking, \( u dv \) can be separated into two functions, for example in

\[
\int x^2 e^{2x} dx
\]

one of the functions is \( x^2 \) and the other is \( e^{2x} \).

To integrate the product of these two functions, draw a cross as shown below. Place \( x^2 \) on the top left and \( e^{2x} \) on the top right section of the cross. Write down the successive derivatives of \( x^2 \) (until you reach 0) in the left column, and successive integrals of \( e^{2x} \) in the right column of the cross. Now what? Well, the solution is there! You just need to write it down. How?

\[
\begin{align*}
2x & \quad + \quad \frac{1}{2} e^{2x} \\
0 & \quad + \quad \frac{1}{8} e^{2x} \\
\end{align*}
\]

Assign a + to the 2-headed arrow on the top and alternate the sign for the rest of the arrows. At this time you can easily write your answer by taking the product of the corresponding functions, connected by the arrows, in the above figure.

\[
\int x^2 e^{2x} dx = + (x^2)(\frac{1}{2} e^{2x}) - (2x)
\]

\[
\frac{1}{2} e^{2x} + (2)(\frac{1}{8} e^{2x}) + \text{Constant}
\]

\[
= e^{2x} \left( \frac{1}{2} x^2 - \frac{1}{2} x + \frac{1}{4} \right) + \text{Constant}
\]

Easy? Of course!
Here are some questions that you can’t wait to ask.

1) How did you know where to place the functions \( x^2 \) and \( e^{2x} \)?

2) What if the successive derivatives of the function on the left did not yield zero?

Question 2) helps you to decide where to place the functions. Now you have only one question to answer, namely 2).

Can you apply this algorithm to integrate \( \int 2 \sin x \cos 4x dx \)?

The answer is: certainly. Believe me it works, try it.

New Courses in Spring 1998...

CPE 610 Code Optimization M-W 5:30 – 6:50 p.m.
CPE 710 Distributed Shared Memory Systems MW 7:00 - 8:20 p.m.
EE 738 Opt Transfer / Pattern Recognition TR 5:30 – 6:50 p.m.

For a complete course listing see Catalog: http://www.uah.edu

ECE Updates...

Fall 1997
Krishna Kavi became the new Eminent Scholar in Computer Engineering.

Congratulations on promotion go out to Associate Professors Timothy Boykin and Mark Maier, and Professor Jeffrey Kulick.

Aed El-Saba joined the ECE Faculty as a Visiting Assistant Professor.

W. C. Leung joined the ECE Dept. as a Research Associate.

Spring 1997
Ned Audeh, Linda Hooper and Delores Wood retired in May. Ned Audeh is now Professor Emeritus in the ECE Dept. Replacing Linda and Delores are Pat Smith and Iliana Chittur.

Summer 1997
Stephen Kowel stepped down as ECE Chair in July to become Interim-Dean of the College of Engineering. Reza Adhami became Interim-Chair of ECE.
Recent Publications and Awards...

Timothy Boykin, Associate Professor

**Journal Papers**

Krishna Kavi, Professor and Eminent Scholar in Computer Engineering:

**Journal Papers**

**Conference papers**
- "Directed research in a reconfigurable flight control and tailless aircraft control on sliding modes," Summer '97 AFOSR Faculty Research Program, Wright-Patterson AFB, Dayton, Ohio, May - June 1997:

**Awards**
An outstanding session presenta-tion award at 1997 American Control Conference, June 4-6, Albuquerque, NM.

Yuri B. Shtessel, Associate Professor

**Grants and Contracts**
- "Sliding Mode Control of Reusable Launch Vehicle Re-entry," NASA, Marshall Flight Space Center (Graduate Student Researchers Program, a graduate student James McDuffie), August 1997- August 2000, Principal Investigator, Grant No. NGT8-52843.

**Summer Fellowships**
- Directed research in a reconfigurable flight control and tailless aircraft control on sliding modes,” Summer ’97 AFOSR Faculty Research Program, Wright-Patterson AFB, Dayton, Ohio, May - June 1997:
- Directed research in the X-33 vehicle control on sliding modes,” Summer ’97 NASA Faculty Fellowship in Aeronautics and Space Research, Marshall Space Flight Center, Huntsville, Alabama, July-August 1997.

**Conference papers**

**Conference papers**
Welcome New Eminent Scholar in CPE

Dr. Krishna Kavi

Dr. Krishna Kavi is currently a Professor and Eminent Scholar of Computer Engineering. Prior to joining UAH, he was a professor of Computer Science and Engineering at the University of Texas at Arlington. For two years (1993-1995) he was a Program Manager at the National Science Foundation, managing Operating Systems, and Programming Languages and Compilers programs in CCR Division. He was an IEEE Computer Society (CS) Distinguished Visitor (1989-91), and editor of the IEEE Transactions on Computers (1993-1997), an editor of the Computer Society Press (1987-1991). His primary research interest lies in Computer Systems Architecture, including dataflow and multithreaded systems, Operating Systems, and Compiler Optimization. His other research interests include formal specification of concurrent processing systems, performance modeling and evaluation, load balancing and scheduling of parallel programs. He published over 100 technical papers on these topics. He received his B.E. (Electrical) from the Indian Institute of Science, MS and Ph.D. (Computer Science and Engineering) from the Southern Methodist University. He is a Senior Member of the IEEE and a member of the ACM.

Recent Publications and Awards (continued from page 3)


Nagendra Singh, Professor, ECE Graduate Affairs Director

During the summer Dr. Singh traveled to India and visited The Indian Institute of Sciences, Bangalore, Raman Research Institute, Bangalore, and Banaras Hindu University, Varanasi. He gave the following seminars:

• Lower Hybrid Waves and Auroral Plasma Dynamics
• Modeling of Liquid Crystal Devices Using the Particle-in-Cell Technique
• Space Technology and Space-craft-Plasma Interactions

Grants

• New grant from NASA/MSFC: “Modeling of the Plasma Source Instrument aboard the POLAR Spacecraft”
• Extension of the grant for the Tether Project, NASA/MSFC: “Modeling of Enhanced Current Collection Measured During TSS-1(R) Mission”
• NSF/NASA grant renewed for the second year.
• NASA/Headquarters grant re-newed for the third year.

John Stensby, Professor

New Book Published

!!!! FREE !!!!!

TAU BETA PI Presents:

Fundamental of Engineering Examination Review Sessions

All Sessions 7:00-10:00 p.m.

10/16/97 - Dynamics
Dr. Elrod, EB 135

10/21/97 - Mechanics of Materials
Dr. Wallace, EB134

10/23/97 - Circuits
Dr. Banerjee, EB 135

10/27/97 - Thermodynamics
Dr. Majumdar, EB 135

10/30/97 - Fluid Mechanics
Dr. Coleman, EB 135

Come to one session or come to all!