

seecs network

Opening Minds to New Technology



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2002 Hillman Fellowships Celebrated!

To Arthur and Sally Hillman, Orlando, Florida, was the ideal city for the couple to put down their roots, raise a family and be part of a strong community. More than 40 years ago, the Hillmans bought a home in the quaint neighborhood of College Park. In this house, the Hillmans raised three children, pursued two successful careers and forged a lasting fondness for the spirit and people of Orlando.

In 1998, the Hillmans decided to sell their home. Yet they wanted the house that meant so much to them to enrich the community somehow. The couple chose to make a real estate gift to UCF and established the Arthur and Sally Hillman Computer Science Endowment Fund.

Interestingly enough, Art and Sally Hillman never attended UCF, nor did their children. Art was born and raised in Orlando, as were his children and grandchildren. Sally has lived here since her family moved to Florida from Illinois when she was 11.

Sally explained, "Living here for so many years, we feel connected to UCF. Our family is here, and we're all part of the same community." Although the Hillmans did not know much about computer science, they knew exactly why they wanted the endowment to be for students in this field.

"Computers and youth are the cornerstones of the world's future," said Art. "Put the two together, help

and foster each, and we have the essence of making the world a better, safer, healthier place to live. This endowment will not only help some young students achieve their goal by lifting some of their financial burden but, hopefully, will help UCF continue its steady march to achieve even more status than it already has as one of the leading computer science universities in the world."

SEECs Director and Associate Dean, Dr. Erol Gelenbe, who worked with the Hillmans to establish this endowment, indicated that the Hillman Fellows are exceptional individuals that are enrolled as Ph.D. students in Computer Science at UCF and who have excelled in research. The 2002 Hillman Fellows are: Duc Tran, Khanh Vu, Ying Cai and Marino Ricardo Lent.

Duc Tran is a Ph.D. candidate in computer science. He received his B.S. (Excellency Class) in computer science from the Faculty of Mathematics and Computer Science, National University of Hanoi, Vietnam. He has earned a number of awards and honors including the Kuersten Scholarship for 2000–2001, the Provost's Award in 1999–2000 and the President Award for scientific research achievement from National University of Hanoi.

Some of Duc's research interests include video modeling and video database systems, delivery protocols for video on demand systems and data



Longtime Orlando residents Art and Sally Hillman (center) are joined by UCF's first President, Dr. Charles Millican (far left) and current President, Dr. John Hitt (far right). The couple established the Arthur and Sally Hillman Computer Science Endowment Fund in Dec. 1998, which helps deserving Computer Science Ph.D. students.

(Hillman Fellowships continued on page 5)

A Graph Theory Niche

CS-based graph theory helps SEECs researchers solve problems for over 20 years

In the School of Electrical Engineering and Computer Science, a handful of researchers are using a rather uncommon tool to solve diverse and complex problems associated with computer science. The tool is graph theory, and it has played a large part in computer science. Without graph theory, for example, it would not have been possible to design modern computer chips, computer networks or even large computer programs.

SEECs is proud of its well-known group of graph theory researchers led by Dr. Robert Brigham, Professor of Mathematics and Computer Science, Dr. Narsingh Deo, Millican Chair Professor of Computer Science and Dr. Ronald Dutton, Professor and CS Program Director. Each professor has an impressive body of graph theory research based on 20 to 30 years of work. Along with their current and past research assistants, Brigham, Deo and Dutton have created a unique niche as one of few university research programs to study computer-science based graph theory instead of math-based graph theory.

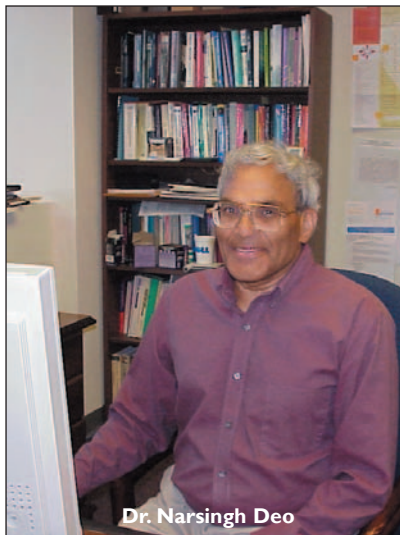
Solving Real World Problems

“Computer science, essentially, solves real world problems,” explained Dutton. “When you study real world problems, what you almost always have to do is take a description of that problem and map it into some object or picture that you can study.” The resulting picture is a graph that almost any discipline can use to find a solution. In a graph, a problem or relationships are divided into discreet entities. Every entity is represented as a point on the graph (points are also called vertices or nodes). Each point is connected by a line (also called an edge) to form the graph.

According to Deo, the origin of graph theory dates back to 1736 and Swiss mathematician Leonhard Euler. As a resident of Königsberg, Germany, Euler wondered if it was possible to cross the city’s network of seven bridges only once during a walk across town. He mathematized his question and took the essential elements of the situation — the location of each bridge, for example — and represented them in a graph using lines and points. His graph proved that if there are more than two points (his graph had four points) with an odd number of lines to or from, it was not possible to cross



Dr. Bob Brigham



Dr. Narsingh Deo



Dr. Ron Dutton

all seven bridges just once. Euler published his findings in 1736 in what many consider to be the first documented use of graph theory. Despite this start more than 260 years ago, graph theory was not truly studied or utilized until recently.

“There are descriptions of graph problems back in the middle ages,” said Dutton. “So graph theory isn’t really new but it’s only been in the past 30 or 50 years that it became a real discipline in mathematics and other fields.”

So how does a mathematical model help solve computer science problems? Dutton explains that with a graph, researchers can state complex problems rather easily. Then they can study the properties (or problem) of the model independent of the application it came from.

Complementary Disciplines

“Computer science and graph theory complement each other,” added Deo. “Computers allow us to solve very large problems concerning graphs, while on the other hand, graph theory helps advance computer science.” One example Deo gave is that chip design — especially for very large microprocessors — wouldn’t be possible without graph theory, yet that same microprocessor will power a computer to process a large graph.

Graph theory was entirely new to Brigham and Dutton when they started studying it in the early 1980s. They learned on their own, and, over the past 20 years, the two professors have moved from a general study of graph theory into more specialized areas. “Initially, we were mainly trying to get that intuitive feel for how to work with graphs and how graphs relate to each other,” recalled Dutton. “In the beginning, most of what we did stayed on the mathematical side of things. Over the years, we’ve moved to where we try to use graph theory to solve problems related to computer science.”

Brigham said, “Early on we did things with the structure of graphs and few graphs we worked on had to do with applications. But now, the number of ideas has expanded tremendously, and we find more applications for our solutions than ever before.” Today, Brigham is working on a variety of projects, one being extremal graph theory and another is imbedding graphs into higher dimensional spaces.

Brad Pyle, a research assistant, has worked in several areas of graph theory alongside Brigham, including domination theory, colorings and competition graph theory. Pyle said, “So many different things can be modeled as a graph. And graph

theory offers both a theoretical discipline and a practical discipline, which I like.” He hopes to continue using graph theory and combinatorics in his future: “I’m in the process of applying to the National Security Agency. I’ve been assured that I’ll use graph theory there, but they can’t tell me how, of course!”

Abundant, Practical Applications

Currently, Dutton is concentrating on alliance graphs with his research assistant, Khurram Hassan Shafique. Dutton said: “With alliance graphs, we look for groups of nodes that would have a strong bond between them, stronger between them than anything outside the group of nodes. This, quite possibly, has all kinds of uses ... military applications, use by pharmaceutical companies and many others.”

Hassan Shafique became interested in graph theory after taking Deo’s class in network optimization at UCF. He started with a broad study in the subject, and now is more in depth in his research. “I just presented a paper with Dr. Dutton entitled, “On Satisfactory Partition of Graphs,” which has many practical applications, such as clustering problems and optimization problems of some types. I think that’s what I like best, that there are so many applications of graph theory. It’s now used in chemistry, social sciences, ecology, biology, geography and even psychology. It’s amazing.”

Graph theory has been a major part of Deo’s career, as well. His involvement in it goes back to the 1960s and his graduate student days at Northwestern University. Since, Deo has used graph theory to solve problems in computer science and electrical engineering, narrowing in on computational graph theory in particular.

A Unique Emphasis

“Computational graph theory is applied to solve many problems in computer science,” said Deo. “Our emphasis here, primarily, is on graph theory for computer science rather than the traditional mathematics-based graph theory. This focus is not found at many other universities.” In fact, his book, “Graph Theory with Application to Engineering and Computer Science,” was published by Prentice-Hall in 1974 and was the first of its kind, with emphasis on graph theory algorithms for computer science and engineering. This book is considered a classic and has been translated into many languages, including Russian, Polish and Portuguese.

Now Deo is working on Web graphs: “The World Wide Web can be modeled as a directed graph where each node is a Web page and each hyperlink is an edge or line. Studying Web graphs gives insight into lots of things, such as Web algorithms for crawling, searching or ranking Web resources. Or if a virus spreads, we can use graph

theory to see how it would travel through the Web. The Internet is a similar, large graph, and if you want to isolate certain cyber attacks, or something, you can do it using graph theory.”

Paulius Micikevicius, a research assistant with Deo, found graph theory appealing as he always liked puzzles and math. “That’s the understatement of graph theory — it’s like working on puzzles,” said Micikevicius. “My graph theory classes with Deo and Brigham were very good — both are great teachers — and they fueled my interest.” Now, he is working with Deo on tree graphs and on graph factorization, which is very applicable to computer science. He is also using graph theory to find the shape of a large molecule consisting of hundreds of thousands of atoms, which has many important applications in the design of pharmaceuticals.

“At most universities, people mostly look at the math side of graph theory. What makes UCF and the School of EECS different is that Deo, Brigham, Dutton and the students really concentrate on computer science graph theory. It is a unique program of research,” added Micikevicius.

Niche a Big Draw

Zoran Nikoloski is also a research assistant with Deo. Graph theory interested Nikoloski in high school when he attended a special summer program in Yugoslavia. Later, he learned graph theory on his own and without a formal course. As an undergraduate studying computer science, he

learned first-hand how well graph theory and computer science fit together. “When I was applying for Ph.D. programs, I realized Dutton, Brigham and Deo were all doing lots of work in graph theory at UCF. I knew they focused on the interrelation between graph theory and computer science and it was a big draw to this program.”

Now Nikoloski is working on tree labelings and a relatively new topic, random graph theory. He is working to implement random graph theory into specific problems, such as a Web graph, and finds this niche very interesting. “It is a subject that can branch off into lots of different directions. And that’s what I like about graph theory — it is very creative and lots of problems from real life can be addressed with it. The application opportunities are huge.”

Brigham also believes there will continue to be tremendous use for graph theory in computer science and in a wide variety of disciplines. “I think there will continue to be more and more applications for graph theory outside of its math origins because graph theory solves practical problems.”



Khurram Hassan Shafique



Paulius Micikevicius



Zoran Nikoloski



Brad Pyle

Distinguished Lecturer and Colloquium Series

Stimulating minds and sharing ideas

Distinguished Lecturers

Kang Shin, University of Michigan

EMERALDS: A Small-Memory Real-Time Microkernel
Friday, January 18, 2002

Earl Dowell, Duke University

Nonlinear Dynamics Of Aeroelastic Systems
Friday, February 22, 2002

Tadao Murata, University of Illinois, Chicago

Possibilistic Performance Evaluation by a Soft Computing Method Using Petri Nets
Wednesday, February 27, 2002

H.J. Siegel, Colorado State University

Research Issues in Heterogeneous Computing
Friday, March 8, 2002

Colloquium Speakers

Ladislau Boloni, Cplane, Inc. Sunnydale, CA

Scheduling On A Heterogeneous Computer Grid
Wednesday, January 23, 2002

Christian Lebiere, Human-Computer Interaction Institute, Carnegie Mellon University

The ACT-R Cognitive Architecture and the Turing Test
Friday, January 25, 2002

J.K. Aggarwal, University of Texas, Austin

Human Motion: Recognition of Actions and Interactions
Monday, February 4, 2002

Yuqing Song, State University of New York, Buffalo

Monotonic Tree and Its Application to Multimedia Information
Tuesday, February 5, 2002

Dimitris Margaritis, Carnegie Mellon University

Probabilistic Model Structures from Data
Thursday, February 7, 2002

Ojas Parekh, Carnegie Mellon University

Approximation Algorithms for the Edge Dominating Set Problem
Monday, February 11, 2002

Li Xiao, College of William and Mary

On Reliable and Fast Peer-Orientated Web Document Sharing
Wednesday, February 20, 2002

Vik J. Kapoor, Nanotechnology Research Center, University of Toledo

Silicon Germanium Technology for Space-Borne Electronic/Communication Systems
Wednesday, February 20, 2002

Sanguthevar Rajasekaran, Department of CISE, University of Florida, Chief Scientist, Arcot Systems

Parallel I/O: Problems and Algorithms
Monday, February 25, 2002

Leonid Tsap, University of California, Lawrence Livermore National Laboratory

Nonrigid Motion Analysis and Applications to Interdisciplinary Projects in Medical Diagnostics, Intuitive Data Exploration and Molecular Dynamics
Monday, March 4, 2002

Jayne Szwarcfiter, Universidade Federal do Rio de Janeiro

Optimal Binary Search Trees with Costs Depending on the Access Paths
Thursday, March 7, 2002

Hassan Foroosh, University of California, Berkeley

Constructing Virtual City Models From Aerial Views and Close-Range Data
Thursday, March 7, 2002

Damla Turgut, University of Texas, Arlington

Efficient Algorithms and Protocols for Stability Management in Mobile Ad Hoc Networks
Monday, March 25, 2002

Dr. K. C. Gupta, University of Colorado, Boulder

Applications of Neural Networks to RF Design and Web-Based Education
Wednesday, March 27, 2002

Amiya Bhattacharya, University of Texas, Arlington

A Predictive Framework for Mobility Management in PCS Networks
Thursday, March 28, 2002

Exceptional Faculty Honored

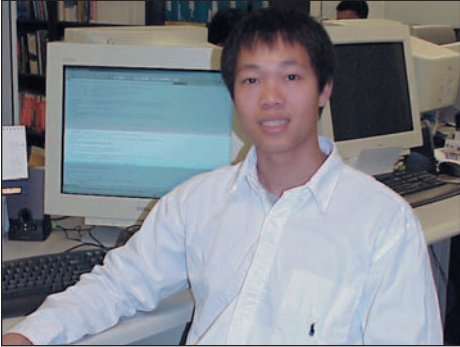
Erol Gelenbe, Director of SEECS and Associate Dean of Engineering, was named a 2002 Fellow of the Association for Computing Machinery. This citation was given for Gelenbe's work in advancing computer and network performance evaluation as an international field of research and application, and for establishing national computer science education programs in France.

Jiann S. Yuan, Associate Professor of Electrical Engineering, was presented with the 2002 Distinguished Researcher Award, College of Engineering and Computer Science, in February 2002. This college-level award is given to a faculty member in CECS based on his or her research performance in the past three to five years. Yuan's research interests include semiconductor device modeling, device and circuit simulation as well as analog/digital circuit analysis and design.

(Hillman Fellowships continued from page 1)

broadcast in wireless environments. One of his current research projects is on video delivery techniques and is sponsored by the National Science Foundation.

"Pursuing a Ph.D. degree is not just taking courses ... I would like to go out and see how and what other researchers in the world are doing," Duc said. "Specifically, I will

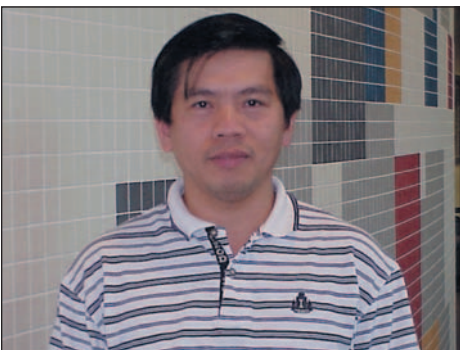


Duc Tran, Hillman Fellow recipient

benefit from the Hillman's award by participating in some upcoming ACM and IEEE conferences on multimedia, which is my main area of research." Duc's advisor is Dr. Kien Hua, Professor of Computer Science.

Khanh Vu is pursuing his Ph.D. in computer science and expects to complete his degree in 2002. He also received his B.S. (Summa Cum Laude) in computer science from UCF. Khanh is involved in the Association for Computing Machinery, the Honor Society of Phi Kappa Phi and the Honor Society of Computer Science Upsilon Pi Epsilon. Among Khanh's honors, he was awarded the UCF Founder's Day Scholars Award, the UCF Graduate Enhancement Award and the UCF Excellence in Action.

His research interests include multidimensional access methods, efficient indexing and retrieval of multimedia data, multimedia database systems plus video multicast and data mining. "The Hillman Fellowship is an honor to add to my resume and it certainly helps in terms of financial support. The

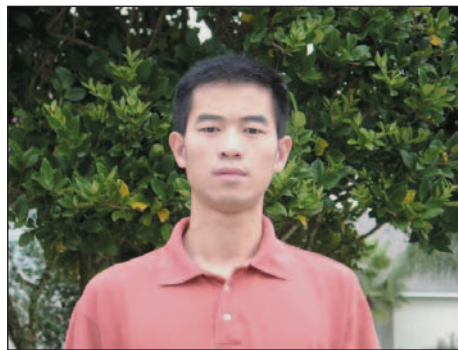


Khanh Vu, Hillman Fellow recipient

honor encourages me to work even harder," said Khanh. His advisor is Dr. Kien Hua.

Ying Cai is a computer science Ph.D. candidate and plans to complete his degree in 2002. He earned his B.S. and M.S. in computer science from Jiaotong University in Xi'an China. Among his other achievements, Ying, along with J. Nguyen and D.R. Smith, filed a patent in Jan. 2001, entitled, "Remote Management of a Storage Network." In 1996, Ying was named Student Researcher of the Year, Institute for Simulation and Training, UCF. He also received the Conference Travel Grant from nStor Technologies Inc. in 1998 and 1999.

Pervasive computing, multimedia communications and database management systems are among Ying's current research interests. He said, "The most enjoyable thing about my studies in our computer science program is that I learned how to do research, which built my confidence. That confidence



Ying Cai, Hillman Fellow recipient

and support from this award will allow me to expand my personal horizons in the future." Dr. Kien Hua is Ying's advisor.

Marino Ricardo Lent completed his M.S. in computer science at UCF in the Fall 2001 semester and intends to complete his Ph.D. in 2002. Ricardo earned a B.S., a post-B.S. degree and a M.S. in Electrical Engineering from Universidad Ricardo Palma in Lima, Peru. Ricardo's research at UCF has included the study of Cognitive Packet Networks (CPN), and during the past two years he has successfully designed and implemented an independent protocol stack for CPN in the Linux kernel. He also is working on how to use CPN in a wireless ad hoc environment. Ricardo also was awarded with the Hillman Fellowship in 2001.

"Receiving an award like the Hillman Fellowship is an indication that I am going on the right track. It gives me positive feedback that encourages me to continue



Marino Ricardo Lent, Hillman Fellow recipient pursuing my goals," said Ricardo. "It also provides significant support for my studies." Ricardo's advisor is Dr. Gelenbe.

Dr. Gelenbe is very thankful for the opportunities the Hillman's have provided for many computer science graduate students. "The support of our community and friends, such as the Hillmans, enables our students to be supported for their hard work, dedicated research and exceptional coursework. On behalf of the School, I thank Art and Sally for their leadership, kindness and support of our CS program. I am also grateful for the leadership and determination of this year's fellowship recipients."

ICSE 2002

International Conference on Software Engineering

Orlando, FL

The UCF CS Program is acting as local host for the **International Conference on Software Engineering** to be held May 19-25, 2002, at the Orlando World Center Marriott Resort and Convention Center. The ICSE is one of the biggest, most significant software engineering conferences of the year.

Tutorials and workshops will be held May 19-21 and May 25.

The main conference sessions are May 22-24.

The conference is seeking student volunteers to help with various support activities. Perks include two days of access to tutorials and conference sessions.

For information on registration and housing visit the ICSE Web site: www.icse-conferences.org/2002/

Invited Keynote Speeches and Seminar Talks

In this issue, we turn our focus to the recent keynote speeches, seminar presentations and colloquium talks given by our faculty. From Paris, France, to Seoul, Korea, and Boston, MA, to Kauai, HI, the SEECS faculty is sharing its research, ideas and expertise in Computer Science, Computer Engineering and Electrical Engineering with a wide variety of audiences and educators around the world.

- E. Gelenbe: "Simulation with Augmented Reality," United Technologies Seminar Series, Boston Univ., Sept. 28, 2001.
- E. Gelenbe: "Gelenbe Networks: A class of queueing networks with product form," Department of Electrical Engineering, Princeton Univ., Oct. 10, 2001.
- E. Gelenbe: "Performances et Qualite de Service dans les Reseaux a Paquets Cognitifs," Ecole Normale Superieure, Paris, France, Dec. 20, 2001.
- E. Gelenbe: "Cheminement du Trafic dans les Reseaux a Paquets Cognitifs," INRIA, Rocquencourt, France, Dec. 21, 2001.
- J. J. Liou: "Recent Advances in RF Semiconductor Devices," University degli Studi di Roma, Rome, Italy, Nov. 2001.

- J. J. Liou: "Reliability of AlGaAs/GaAs and InGaP/GaAs Heterojunction Bipolar Transistors," IBM, Fishkill, NY, Dec. 2001.
- J. J. Liou: "RF Transistors and Circuits: A Historical Prospect," IEEE Korea Section, Seoul, Korea, Sept. 2001.
- J. J. Liou: "SPICE Modeling of Electrostatic Discharges (ESD) in Microchips," Univ. of Nevada, Las Vegas, NV, Oct. 2001.
- M. Shah: "Understanding Human Behavior Using Video Sequences," NSF/NIMA Defining a Motion Imagery Research and Development Program Workshop, Washington, D.C., Nov. 28-30, 2001.
- M. Shah: "Mentoring Undergraduates in Computer Vision Research," IEEE Workshop on Combined Research-Curriculum Development in Computer Vision, Kauai, HI, Dec. 10, 2001.
- M. Shah: "Target Detection and Tracking in FLIR Imagery," U.S. Army AMCOM AMSAM-RD-MG-IP, Redstone Arsenal, AL, Oct. 15, 2001.
- J. Zalewski: "Developing Component Based Software for Real-Time Systems," EUROMICRO Workshop on Component-Based Software Engineering, Warsaw, Poland, Sept. 4-6, 2001.

News Bytes and Bits



Raytheon Co. Supports SEECS

Anthony Sagardia (right), UCF Campus Manager for Raytheon Co., presents **Erol Gelenbe** (left), SEECS Director and Associate Dean, with a \$10,000 check made out to the UCF Foundation. Raytheon approved our SEECS request for funding to support the integration of computer and network security into the SEECS curriculum.

Erol Gelenbe, SEECS Director and Associate Dean, was appointed to the Scientific Advisory Board of the French journal *Annales des Telecommunications*. He was also the focus of an interview article in the Association for Computing Machinery publication *Ubiquity*. The article, entitled, "Talking with Erol Gelenbe," is found in Vol. 3, Issue 2 (dated Feb. 26 – Mar. 4, 2002) or online at: www.acm.org/ubiquity/interviews/e_gelenbe_1.html.

Christine Lisetti, Assistant Professor of Computer Science, was interviewed about her research in *Artificial Intelligence* for a story entitled, "Why is that Computer Laughing?" The article appeared in the Sept.-Oct. 2001 issue of *IEEE Intelligent Systems*.

Mubarak Shah, Professor of Computer Science, was the Organizer of the NSF REU Principal Investigator Meeting, Orlando, FL, Jan. 14, 2002. Previously he was Co-Chair of the *IEEE Workshop on Combined Research-Curriculum Development in Computer Vision*, Dec. 10, 2001, Kauai, HI. He was Session Chair at the *Asian Conference on Computer Vision*, Melbourne, Australia, Jan. 24, 2002. Shah was also featured in the article, "Better Get to Work, Your Computer Could be Watching," which appeared in the Nov. 5, 2001 issue of *InformationWeek*. A story about his research also appeared in the Nov. 3, 2001 edition of *New Scientist*.

J. S. Yuan, Associate Professor of Electrical Engineering, was appointed in 2001 as Associate Editor of the *IEEE Transactions on Device and Materials Reliability*.

Recent SEECs Journal & Conference Publications

- A. Abdalla, **N. Deo**, "Random-Tree Diameter and the Diameter-Constrained MST," *International Journal of Computer Mathematics*, Vol. 82, No. 1/2, 2001.
- G. Anagnostopoulos, M. Georgiopoulos, T. Kasparis**, A. Koufakou, "Cross-Validation in Fuzzy ARTMAP for Large Databases," *Neural Networks*, Vol. 14 No. 9, pp. 1279-1291, Nov. 2001.
- Y. Argotti, L. Davis, V. Outters, **J. P. Rolland**, "Dynamic Superimposition of Synthetic Objects on Rigid and Simple-Deformable Real Objects," *Proceeding of ISAR*, Oct. 5-10, 2001.
- D. Ayers, **M. Shah**, "Monitoring Human Behavior from Video Taken in an Office Environment," *Image and Vision Computing*, Vol. 19, Issue 12, pp. 833-846, Oct. 1, 2001.
- M. Bassiouni, W. Cui**, "Channel Planning and Fault Recovery in Hierarchical Hybrid Cellular Networks with Mobile Routers," *Proceedings of IEEE Wireless Local Networks — 26th LCN Conference*, Nov. 2001, pp. 646-652.
- M. Bassiouni, H. El-Aarag**, "Performance Evaluation of TCP Connections in Ideal and Non-Ideal Network Environments," *Journal of Computer Communications*, Elsevier Publishing, Vol. 24, No. 18, pp. 1769-1779, Dec. 2001.
- M. Bassiouni**, C. Fang, "Dynamic Channel Allocation for Real-Time Connections in Highway Macrocellular Networks," *Journal of Wireless Personal Communications*, Kluwer Publishing, Vol. 19, No. 2, pp. 121-128, Nov. 2001.
- R. C. Brigham**, G. Chartrand, **R. Dutton**, P. Zhang, "Full Domination in Graphs," *Discussions Mathematicae Graph Theory*, 21, pp. 43-62, 2001.
- R. C. Brigham, R. Dutton**, "On Tree Partitions," *J. Comb. Math. & Comb. Computing*, 37, pp 53-63, 2001.
- D. Charalampidis, **M. Georgiopoulos, T. Kasparis, J. P. Rolland**, "Segmentation of Textured Images Based on Fractals and Image Filtering," *Pattern Recognition*, Vol. 34, No. 10, pp. 1963-1973, 2001.
- N. Deo, P. Gupta**, "Sampling the Web Graph with Random Walks," *Congressus Numerantium*, Vol. 148-153, Dec. 2001.
- N. Deo, P. Gupta**, "Graph Theoretic Web Algorithms: An Overview," *Lecture Notes In Computer Science*, Vol. 2060 (eds. Bohme & Unger) Berlin, Germany, pp. 91-102, 2001.
- N. Deo, P. Micikevicius**, "Prufer-Like Codes for Labeled Trees," *Congressus Numerantium*, Vol. 151, pp. 65-73, Dec. 2001.
- N. Deo**, N. Sankaranarayanan, **F. Suraweera**, "Two Protocols for Multicast Communication," *Congressus Numerantium*, Vol. 148-153, Dec. 2001.
- D. Gan, **Z. Qu, X. Wu**, "Stability-Constrained Operation for UPFC Devices," 2001 IEEE/PES Transmission and Distribution Conference and Expo, HVDC and FACTS session, Atlanta, GA, Oct. 2001.
- E. Gelenbe, K. Hussain, V. Kaptan**, "Simulating Autonomous Agents with Augmented Reality," Opening Keynote Paper, Second International Conference on Intelligent Games and Simulation, Society for Computer Simulation, London, England, Nov. 30 - Dec. 1, 2001.
- E. Gelenbe, R. Lent, Z. Xu**, "Dependable Design of Cognitive Packet Networks," Invited Keynote Paper, Conference on Design of Reliable Communication Networks, Budapest, Hungary, Oct. 8, 2001.
- M. Georgiopoulos, D. Haralampidis, T. Kasparis, J. P. Rolland**, "Classification of Textures Based on Fractals and Image Filtering," *Pattern Recognition* 34, pp. 1963-1973, Oct. 2001.
- P. Gmytrasiewicz, **C. L. Lisetti**, "Emotions and Personality in Agent Design and Modeling," in Working Notes of the AAAI Fall Symposium Series on Socially Intelligent Agents: The Human in the Loop, Menlo Park, CA, Nov. 2001.
- F.J. Gonzalez, J.P. Rolland**, V. Shaoulov, "The Art of Back-of-the-Envelope Paraxial Raytracing," *IEEE Transactions in Education*, Vol. 4, No. 4, pp. 365-372, Nov. 2001.
- W. Halang, **J. Zalewski**, "Programming Languages for Use in Safety-Related Applications," IFAC Conference on New Technologies for Computer Control, Hong Kong, P. R. of China, Nov. 19-21, 2001.
- K. Hassan-Shafique, M. Shah, N. da Vitoria Lobo, A. Yilmaz**, "Target-Tracking in FLIR Imagery Using Mean-Shift and Global Motion Compensation," Workshop on Computer Vision Beyond the Visible Spectrum, Kauai, HI, Dec. 14, 2001.
- C. E. Hughes, J. M. Moshell**, D. Reed, "Internet-Based Virtual Environments" in *Handbook of Virtual Environments: Design, Implementation, and Applications* (K. M. Stanney, Ed.) Lawrence Erlbaum Associates, pp. 333-352, Dec. 2001.
- C. E. Hughes, J. M. Moshell**, "Virtual Environments as a Tool for Academic Learning" in *Handbook of Virtual Environments: Design, Implementation, and Applications* (K. M. Stanney, Ed.) Lawrence Erlbaum Associates, pp. 893-910, Dec. 2001.
- C. Ihfeld, Y. Jin, **Z. Qu**, A. Saengdeejing, "Fault-Tolerant Robust Control of Nonlinear Uncertain Systems Against Sensor Failures," 2001 IEEE Conference on Decision and Control, pp. 1472-1478, Orlando, FL, Dec. 2001.
- O. Javed, S. Khan, M. Shah**, "Tracking in Uncalibrated Cameras with Overlapping Field of View," Second IEEE International Workshop on Performance Evaluation of Tracking and Surveillance, Kauai, HI, Dec. 9, 2001.
- Y. Jin, **Z. Qu**, "Robust Control of Nonlinear Systems in the Presence of Unknown Exogenous Dynamics," 2001 IEEE Conference on Decision and Control, pp. 2784-2790, Orlando, FL, Dec. 2001.
- J. van Katwijk, J. J. Schwarz, **J. Zalewski**, "Practice of Real-Time Software Architectures," IFAC Conference on New Technologies for Computer Control, Hong Kong, P. R. of China, Nov. 19-21, 2001.
- S. Khan, M. Shah**, "Object Based Segmentation of Video Using Color, Motion and Spatial Information," IEEE Computer Vision and Pattern Recognition Conference, Kauai, HI, Dec. 11-13, 2001.
- A. Pakstas, I. Schagaev, **J. Zalewski**, "Redundancy Classification for Fault-Tolerant Computer Design," IEEE 2001 International Conference on Systems, Man and Cybernetics, Tucson, AZ, Oct. 7-10, 2001.
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- (Highlight = SEECs faculty or graduate student)



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CS Major One of 16 Semi-Finalists to Vie for \$100,000 in TopCoder Invitational

Computer Science major Ambrose Feinstein recently put his skills to the test against the nation's top coding wizards for a chance at a \$100,000 grand prize. Feinstein was one of 16 professional and amateur programmers to reach the semi-final round of the first-ever TopCoder Invitational, which was held on Nov. 2 and 3, 2001, at the Foxwoods Casino and Resort in Mashantucket, CT.

The invitational tournament lasted for three months with online elimination matches held each week. Then the top 256 programmers from the online matches competed in regional rounds to determine the 16 semi-finalists. Feinstein, who competes in a variety of programming competitions, found the competition to be stimulating.

"All of the problem sets were very difficult," says Feinstein. "I started on the hardest problem and probably should have used another strategy. In the format TopCoder uses, time is just as significant as total problems solved. So it was challenging but still fun."

Scoring in TopCoder competitions is based on two factors: intensity (the ability to use a particular coding language while under pressure) and velocity (the ability to write good code quickly and accurately.) The Orlando resident's competition included programmers from Stanford, California Institute of Technology, Cornell, MIT and University of California, Berkeley. Although Feinstein didn't advance to the finals, it is a terrific achievement to reach this level.

"The fact that Ambrose made it to this level is a very good indicator of what excellent students we have in SEECS and what



Ambrose Feinstein's competition group, which competed last in the TopCoder semi-finals, included (from left) James Lee (*handle: stevevai*), Feinstein (*handle: ambrose*), Jason Woolever (*handle: qubits*) and Jon Salz (*handle: milhouse*).

fine programs we offer," said Dr. Ali Orooji, Feinstein's professor and advisor of his ACM programming team. "We're very proud of how successful Ambrose has been in these competitions."

The \$100,000 prize went to Stanford student Jon McAlister of Houston, TX, but Feinstein wasn't too disappointed. Sponsored by TopCoder Inc., a new company that recruits computer programmers for high-tech corporations, the tournament prominently displayed his programming talents for various facets of the industry.