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Center for Global Electronic Commerce

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Greetings from the Director

France Belanger, CGEC Director

As a meeting point for researchers, educators, and practitioners, the Center for Global Electronic Commerce's job is to promote practical, interdisciplinary research in the areas of electronic business; respond to industry need in these areas; and, promote a curriculum for electronic business education. We are pleased to announce many exciting events and projects related to e-business research, education, and outreach that our members have initiated since our last bi-annual newsletter (April 2003).

In this newsletter, you will find updates on currently sponsored research and curriculum projects as well as descriptions of new proposals. In the last six months, our members have received funding from the Boeing Charitable Trust, the National Science Foundation, and the Internet Technology Innovation Center to develop e-commerce related research projects and curricula, and the Center has established research partnerships with corporations (*see Sponsored Projects, below*).

On page 3 (*CGEC Research*), we are proud to highlight the research of Dr. Deborah Cook (Business Information Technology, BIT) and Dr. Christopher Zobel (BIT) on simulation models for business processes. On the same page, we introduce you to one of our gifted graduate students, Mr. Christian Schaupp (Accounting and Information Systems, ACIS) and his research on online customer satisfaction. A sample list of our recent and upcoming publications concludes the section on research (*see Recent CGEC Publications, page 4*). Also starting on page 3, you will read updates on other important CGEC activities, including the latest news regarding the CGEC advisory board, our newly redesigned web site, and a presentation I delivered in South Korea this spring.

I hope you will enjoy reading about the many recent accomplishments of the CGEC. Do not hesitate to contact me (ecommerce@vt.edu) for further information on any one

Sponsored Projects

Archaeology Digital Library

National Science Foundation

Archaeological data currently are scattered across various intranets and web sites, and new information constantly is being unearthed from active excavation sites. As a result, archaeologists find it difficult to manage the process of archiving and disseminating data. The proposed digital library focused on Near Eastern studies will, for the first time, enable archaeologists, humanists, and social scientists to gather, preserve, and publicize historical and real-time data for research, education, and public information in a timely and universally accessible fashion. As the library will be open to the general public in addition to scientists, it also may foster the development of a larger and more diverse community of people interested in archaeology. CGEC members Edward Fox (Computer Science) and Weiguo "Patrick" Fan (ACIS), will serve as technical sub-contractors on the project, which has received an initial one-year grant of about \$56,000 from the NSF, with another \$330,000 expected over the next two years. The principal investigator on the project is James Flanagan from Case Western Reserve.



Security Assurance and Business Ethics in the Curriculum

Boeing Charitable Trust Fund

The CGEC received a \$10,000 grant from the Boeing Charitable Trust Fund to increase the security assurance and business ethics content of courses in the E-Business Minor curriculum. CGEC members Sam Hicks (ACIS), Janine Hiller (Finance and Business Law) and Nancy McGehee (Hospitality and Tourism Management), as well as CGEC Director France Belanger will develop a CD resource that can be used in several courses. It will offer modules on security and business ethics that will contain series of cases, scenarios and exercises, as well as presentation material, which will force students to consider a variety of ethical and security-related issues in business.

Research Planning Grant

Internet Technology Innovation Center

The Internet Technology Innovation Center awarded the CGEC a \$10,000 grant to revise and submit a proposal on retention of minorities in the IT workforce to the National Science Foundation. The proposal will increase the number of Virginia-based universities collaborating on the project.

A Holistic Approach to the Design and Management of a Secure and Efficient Distributed Generation Power System

National Science Foundation

Virginia Tech's Consortium on Energy has received a \$350,000, 3-year NSF grant to effectively and securely design and manage a distributed generation power system. The Consortium is a group of faculty members and graduate students working in six departments, one of whom is CGEC member Ralph Badinelli.

Modeling Web Site Success

CGEC Partnership with New City Media

The CGEC has joined forces with New City Media, Inc., a Web development and consulting company based in Virginia Tech's Corporate Research Center to develop a comprehensive framework for modeling web site success. The research team includes David Poteet, CEO of New City Media; Jeannine Everhart, Project Director at New City Media; CGEC members France Belanger (Director of the CGEC and ACIS) faculty); Patrick Fan (ACIS faculty); and Kent Nakamoto (Marketing Department Head); doctoral students Christian Schaupp (ACIS) and Anjala Krishen (MKTG); and the CGEC grant writer Aaron Doyle. Over the course of the next twelve months, the team will develop metrics to measure Web site success and model user behavior to predict such success. The team is making plans to target several funding agencies to sponsor the research.

Featured Proposal

Resilience of African-Americans in Information Technology: Persistence in Educational Programs and Transition to the Workplace and Graduate Studies

To address the issue of under-representation of African-American students in IT programs and the IT workforce, this research project involves a three-year longitudinal study that focuses on retention rather than attraction of minority students in IT programs. Four outcome measures will be studied: (1) attraction of African-Americans to IT disciplines, (2) persistence of these students in the discipline, (3) degree attainment of these African-American students, and (4) first year employment or graduate school decisions of these African-American CS/IT graduates. The study constructs and tests a model of IT resilience (i.e., education-workplace transition), which reflects direct and indirect effects of institutional, intrapersonal, and interpersonal variables on in-major persistence, graduation, and employment decisions. CGEC member Wanda Smith is leading this project, with involvement of colleagues at Radford University and Virginia Commonwealth University, as well as CGEC Director France Belanger.

CGEC Research

Featured Faculty Research: Deborah Cook and Christopher Zobel

Simulation Models for Business Processes

Dr. Deborah F. Cook and Dr. Christopher W. Zobel focus their research effort on developing and applying techniques to help businesses model their processes and extract valuable information from these models. Drs. Cook and Zobel apply analytical techniques including neural networks (NNs) and genetic algorithms (GAs) to extract information about input/output parameter relationships from business process simulation models. While a good simulation can provide a means for effectively modeling a system, it also may require repeated trials to produce meaningful results about the underlying relationships between process inputs and outputs. By approximating the simulation model with a GA/NN metamodel, the researchers analyze the structure of the NN to determine characteristics of the process and use GAs to search for particular types of parameter combinations, thus developing a more descriptive model of the business process. This type of information modeling and extraction applies to many business processes including analysis of customer behavior and analysis of manufacturing process behavior.

Dr. Cook is an Associate Professor in the Business Information Technology Department at Virginia Tech. She obtained her Ph.D. from Texas A&M University in Industrial Engineering, and M.S. and B.S. degrees from Virginia Tech. Her research interests focus on process modeling and control in manufacturing operations. Her teaching interests are in the areas of operations management and e-business. She has obtained research funding from the National Science Foundation, Temple-Inland Forest Products Corporation, Texas Higher Education Coordinating Board Advanced Technology Program, and the USDA Forest Service.

Dr. Zobel is Assistant Professor of Business Information Technology at Virginia Tech. He received the Ph.D. in Systems Engineering from the University of Virginia, the M.S. in Mathematics from the University of North Carolina at Chapel Hill, and the B.A. in Mathematics from Colgate University. His primary research interests are in the areas of intelligent decision support systems, knowledge engineering, large-scale stochastic decision problems, neural networks, and computer-based simulation.

Student Research: Christian Schaupp

Online Customer Satisfaction

Assessing the customer satisfaction level of online shopping is essential to gauging the success and failure of e-commerce. The Internet business must be able to determine and understand the values of its existing and potential customers. Hence, researchers must develop and validate a diverse array of metrics to comprehensively capture the attitudes and feelings of online customers. What factors make on-line shopping appealing to customers? What customer values take priority over others? Mr. Schaupp is focused on answering these questions, examining the role of several technology, shopping, and product factors using a conjoint analysis of consumer preferences to measure online customer satisfaction (e-satisfaction). His results indicate that transaction confirmation screens, privacy statements, and good searching capabilities were the most important technology attributes in determining consumer online satisfaction. Further, for shopping factors, ease of shopping, customer's faith in the merchant/system, and provision of a tracking number were found to be the important attributes. Finally, product factor attributes with highest importance were extensive assortment and variety of product, cost, and customization capabilities.

L. Christian Schaupp is a doctoral student in the department of Accounting and Information Systems, specializing in e-business success topics.

CGEC Web Site Update

We are pleased to announce that the CGEC Website has been redesigned. While some pages are still under construction, you can view the pages at www.cob.vt.edu/cgec. Please send us any feedback or comment to ecommerce@vt.edu.

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CGEC Director in South Korea

In May, CGEC Director France Belanger had the honor of delivering a presentation titled, "Global Trends in the Knowledge-based Service Industry and E-Commerce," in Seoul, South Korea, at a seminar sponsored by the South Korean Ministry of Commerce, Industry, and Energy. During the seminar, the participants from industry and government discussed trends in the world service industry. The presentation and a follow-up interview were featured in two separate articles in the Maeil Business Newspaper.

CGEC Advisory Board News

The CGEC Advisory Board now includes members from Accenture, Anthem, Honeywell, IBM, Wachovia, and Pamplin Alumni. Discussions are being held with other potential members. Once the Board is complete, we will provide you with more information.

Sample Recent CGEC Publications

ADOPTING BUSINESS-TO-CONSUMER ELECTRONIC COMMERCE: THE EFFECTS OF TRUST AND PERCEIVED INNOVATION CHARACTERISTICS: Craig Van Slyke, **France Bélanger**, and Christie Comunale (2004), *The Data Base for Advances in Information Systems*, 35:2, pages forthcoming.

THE ARCHITECTURE OF COMMKNOWLEDGE: COMBINING LINK STRUCTURE AND USER ACTIONS TO SUPPORT AN ONLINE COMMUNITY: M. D. Gordon, **Weiguo Fan**, S. Rafaeli, H. Wu, and N. Farag (2003), *International Journal of Electronic Business*, 1(1).

CONTEMPORARY VIRTUAL ENVIRONMENTS: INTRODUCTION TO SPECIAL SECTION: Manju Ahuja, **France Bélanger**, and Mary Beth Watson-Manheim (2004), *The Data Base for Advances in Information Systems*, (35:1), Winter, pages forthcoming (editorial).

DISCOVERY OF CONTEXT-SPECIFIC RANKING FUNCTIONS FOR EFFECTIVE INFORMATION RETRIEVAL BY GENETIC PROGRAMMING: **Weiguo Fan**, M. D. Gordon, and P. Pathak (2003, in press), *IEEE Transactions on Knowledge and Data Engineering*.

EFFECTIVE PROFILING OF CONSUMER INFORMATION NEEDS: A UNIFIED FRAMEWORK AND EMPIRICAL COMPARISON: **Weiguo Fan**, M. D. Gordon, and P. Pathak (accepted 2003), *Decision Support Systems*.

A FRAMEWORK FOR E-GOVERNMENT: PRIVACY IMPLICATIONS: **France Bélanger** and **Janine S. Hiller**, (forthcoming), *Business Process Management Journal*, volume, issues and pages forthcoming.

A GENERIC RANKING FUNCTION DISCOVERY FRAMEWORK BY GENETIC PROGRAMMING FOR INFORMATION RETRIEVAL: **Weiguo Fan**, M.D. Gordon, and P. Patha (2003, in press), *Information Processing and Management*.

RANKING FUNCTION OPTIMIZATION FOR EFFECTIVE WEB SEARCH BY GENETIC PROGRAMMING: AN EMPIRICAL STUDY: **Weiguo Fan**, M. D. Gordon, P. Pathak, W. Xi and E.A. Fox (2004), in the *Proceedings of 37th Hawaii International Conference on System Sciences (HICSS)*.

THE ROLE OF E-COMMERCE IN KNOWLEDGE-BASED SERVICE INDUSTRIES: **France Bélanger** (2004), *Journal of Electronic Commerce in Organizations*, 2:1, (Jan.-March), pages forthcoming.

TOWARDS A THEORY OF CYBERPLACE: A PROPOSAL FOR A NEW LEGAL FRAMEWORK: **Janine Hiller** and Ronnie Cohen, *Richmond Journal of Law and Technology*, Volume 10.

TOWARDS ANSWER-FOCUSED SUMMARIZATION USING SEARCH ENGINES: H. Wu, D. R. Radev, and **Weiguo Fan** (2004), in *New Directions in Question Answering*, edited by Mark Maybury.