Message from the Dean

Information Technology, E-Commerce and New Media

by Dr. Susan M. Merritt

Since its inauguration in 1983 the School of Computer Science and Information Systems (CSIS) has offered programs in computer science, information systems, telecommunications, and technology systems (formerly called office information systems). These programs exist at the baccalaureate level, the master’s level, and most recently, the doctoral level. In recent times new areas have emerged, and we in CSIS are working hard and fast to respond. I will discuss these three “emerging technologies” in this message: Information Technology, E-Commerce, and New Media.

Information technology is the oldest of the three. There is not a common understanding of the term; in some cases it refers to computer programming. In some cases it refers to systems integration. More recently information technology has come to refer to programming and other kinds of systems and software development with focus on the Internet and the World Wide Web. Another way to understand this is that information technology has to do with programming developed particularly in distributed systems environments. CSIS has been responding to the need for information technology workers throughout our history through our degree programs and also through our not-for-credit offerings such as the UNIX/C++ program. We continue to do so as we adjust our focus to the Web. We inaugurated a new not-for-credit offering last fall, the Internet Technologies and E-Commerce program. We are preparing to offer a new master’s degree beginning in Fall 2000 and a credit-bearing certificate, both in Information Technology for E-commerce. These programs specifically focus upon application development for distributed environments on the Internet and World Wide Web, including e-commerce.

That brings us to the next area, e-commerce, or e-business. In the early days e-commerce typically meant advertising over the Internet. Since then e-business has evolved and includes human interface issues; database, data warehousing, data mining, and other large scale data problems; as well as business processes that are changing with the emergence of e-business. It was recently said that in a few years from now the term e-business will not exist; all business will be “e.” One of the new e-opportunities that CSIS is pursuing is a Center for Advanced Technology (CAT) in the Hudson Valley. A collaboration of business and government leaders in the Hudson Valley have noted that there is no such center and that there is a need for research, education and training in the seven counties in the mid-Hudson Valley in order to assist small and medium businesses to move into e-commerce.

We are currently collaborating with others in creating a proposal for the Center for Advanced Technology with the support of business and government. We look forward to increased activities in this area including a possible training presence at the new World Trade Center at Stewart International Airport in Newburgh.

The third area which has emerged is new media. A recent press release by PricewaterhouseCoopers has indicated that Silicon Alley in New York City represents the only new major industry in New York City in many decades. It indicates that the new media industry has created some 146,000 new jobs. New media embraces such things as multimedia, web development, web design and spans a spectrum from art to high technology. We have been fortunate to receive a trustee gift of $250,000 over five years for the development of a new media center, probably to be placed in downtown Manhattan.

CSIS TO HONOR PRUDENTIAL EXECUTIVE

by Louise P. Kleinbaum, Assistant Dean and Director, Academic Systems

The School of Computer Science and Information Systems has selected William D. Friel, senior vice president and chief information officer of the Prudential Insurance Company of America, to be the honoree at this year’s Annual Leadership and Service in Technology Award Reception. The reception will be held on Wednesday, June 7, 2000 in New York City.

This year’s reception will take place at the spectacular Bloomberg offices at 499 Park Avenue and will, once again, be a gathering of prominent leaders in the field of Information Technology as well as members of the Pace Community, including students, alumni/ae and friends. Michael Bloomberg himself will be on hand to deliver opening remarks and will arrange for short tours of the facilities. The location was secured by Joan Tucker, executive vice president for university advancement at Pace.

The Leadership and Service in Technology Award is presented annually to an individual or company that best exemplifies leadership in the field of technology, innovation in the development and application of technology to serve people, and commitment to community service and education. This year marks the fifth time that the award will be presented.

Mr. Friel joined Prudential in 1988 as a vice president in the information systems department. In 1990 he was named executive vice president of the newly formed Prudential Service Company and was later promoted to chief executive officer in 1993. He became
Students Reflect on Their First Semester of Doctoral Study

by Kathleen Dunleavy, Director of Community Affairs

In September 1999, the School of Computer Science and Information Systems launched an exciting venture into doctoral level education: The Doctor of Professional Studies in Computing. This new degree, which is offered in the State of New York and recognized as a research doctorate equivalent to the Ph.D. by the National Science Foundation, is structured for working information technology professionals. It is a part-time program comprised of a monthly weekend residency combined with ongoing, asynchronous study. The curriculum emphasizes integrated study among the computing disciplines including computer science, information systems, telecommunications, and emerging technologies as well as applied research in one or more of them. The program’s first class includes students from such companies as IBM, E*Trade, Bell Atlantic and Oracle.

So, with an entire semester under their belt, we wondered how the members of the first D.P.S. class were faring. In initially contemplating pursuing a Ph.D., many of the students said they were put off by the fact that most Ph.D. programs require a full-time commitment. The flexibility, convenience and three to four year timeframe of the D.P.S. program appealed to these busy professionals. Vera Rhoads, director of e-business for AARP and a Pace alumna, became interested in the D.P.S. program after having an engaging discussion with Pace University president, Patricia O. Ewers at an alumni event in Washington D.C. last year. Subsequently, Rhoads attended a presentation by Dr. David Sachs, assistant dean, about online learning which “sold her on the program.” Dennis Williams, systems specialist at Bell Atlantic, similar to the majority of his fellow students, has a demanding full-time job and a family. He states, “a traditional Ph.D. program would have been impossible for me.” Williams sees the acquisition of the D.P.S. not only as a way to advance his career, but also as a way to acquire crucial knowledge.

In the rapidly developing world of information technology, the requirements of the day can change radically and information quickly becomes outdated. Les Beckford, database developer at Sybase, says, “This program allows me to learn subject matter before it becomes obsolete.” Rhoads states that “We’re not learning about today’s technology; we are learning about tomorrow’s.”

All of the students in the first class of this new program report that they are particularly pleased with the diversity of their class. The first D.P.S. class is an eclectic group representing a variety of professionals from many levels who work in telecommunications, banking, e-commerce, and finance. The students are diverse in age, educational, ethnic and geographical backgrounds (with two students based in California). Apparently, this diversity is proving to be an educational benefit to the class. Thanh Van Lam, software system tester at IBM, states that the interaction with his classmates who have very broad backgrounds and work in many different technologies is invaluable. And the teamwork involved in the D.P.S. coursework is unanimously reported as a positive experience.

Due to the fact that the D.P.S. degree includes a large asynchronous component … what about the big question: how do the students find learning online? Although the online component allows the students flexibility in time and location, it is a novel experience for many. Students report that good, old-fashioned, face-to-face communications are still the most desirable. Online learning has its own set of “challenges” as one student put it. Rhoads and others say that it is extremely convenient and they look forward to the enhancement of online communications and the implementation of more sophisticated technologies in order to better communicate in a virtual manner.

Perhaps the best and most incisive comment about the D.P.S. program to-date was made by Thanh Van Lam, “So far, so good.”

Message from the Dean

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Pace University

CSIS to Honor Prudential Executive

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the company’s first chief information officer in October 1995. In his role as CIO, he is responsible for leading company-wide information systems and technology functions.

In addition, Bill Friel is a member of the advisory boards of Microsoft, IBM, and Intel, and serves as chair of the New Jersey Tech Corps. In 1999 he was described as one of the most successful CIOs in the insurance industry by Insurance & Technology magazine and was named to their “Elite Eight.” More recently he was honored by Network World magazine as one of the “25 Most Powerful People in Networking.”

Bill Friel holds an undergraduate degree from St. John’s University and is a graduate of the Advanced Management Program at the Wharton School.

The proceeds of the Leadership and Service in Technology event will go to the CSIS Endowed Scholarship Fund. The Sponsorship Committee, co-chaired by CSIS Advisory Board Members, Mark Kay of J.P. Morgan, Catherine Kinney of the New York Stock Exchange, and Raul Perez of UNIT TECH, has set a goal of $120,000 for this year.

All members of the Pace community are invited to attend. For additional information about the event, please contact Louise Kleinbaum, assistant dean and director, academic systems, at either (914) 422-4191 or lkleinbaum@pace.edu.
The NACTEL program continues to provide high quality education to students located throughout the United States. Employees of Bell Atlantic, GTE, US West and SBC are enrolled in a wide array of courses being taught over the Internet. 256 students are participating in the Early Spring 2000 semester. Students range in age from 20–55; their average age is 38. They live in 34 different states, including Hawaii and Alaska. Women make up 40% of the student body.

A wide array of courses is being offered this semester. Students are taking the Academic Skills Seminar, Technical Math, AC/DC Electrical Circuits, Solid State Devices, and Telecommunications I. In addition, students are taking Business and Technical Communications, English 101, and English 105 for the first time. Physics for Telecommunications is being taught this spring after having been significantly revised since its pilot last fall.

The FIPSE Grant that was awarded to Pace University in August 1999 provides funding to enable work in three areas related to online instruction. These areas are enhanced student support services, mentors, and online testing. The work in enhanced student support services has consisted initially of surveying all NACTEL students to determine their current level of satisfaction. Students were surveyed online in November 1999. In addition, 30 students were interviewed by phone. The results indicate that, for the most part, students are pleased with the program. However, there are areas in need of improvement, and plans are underway to address them.

Online testing has focused on security and verification issues. Approximately 75 students participated in a pilot-proctoring program that began in November 1999. Students were asked to find a proctor to administer their midterm and final exams. All of the necessary online forms for students and proctors were created. In addition, it became evident that it would be necessary to have a database to keep track of all of the information that the proctoring program entails. An additional 125 students are participating in another pilot of the proctoring program this spring.

Significant work on the infrastructure required for online instruction continues. Continued improvements to the Web servers and administrative database are being made, in direct response to student and faculty and staff concerns. In addition, a pilot tutoring program for math and physics students is being tested. Enrolled students will have access to tutors who are provided by a company called Smartthinking. Students will have access to trained individuals between 4 p.m. and 1 a.m., if they have significant problems with their math or physics assignments and would like someone to turn to for help. All of us are interested in seeing how this will work.

Many people continue to be actively involved in the NACTEL project. Key Pace University staff include Matthew Poli, Nancy Uhl, Nancy Treuer, Bernice Houle, Erich Markert, Paulette Muler-Girard, Fred Dreyfus, Helen Beuka, Alex Skiadas and Jai Pong. Pace University faculty include Dr. David Sachs, Professor Nancy Hale, Dr. Barbara Farrell, Professor Sylvia Russakoff, Professor Hap Gaylord, Dr. Gus Mascuilli, Dr. Sue Huang, Dr. Patricia Giurgescu, Dr. Susan Feather, Professor Beth Gordon Klingner, Professor Jean Fitzgerald, Professor John Hutton, Dr. Sam Egelbaum, Professor Kitty Daniels, Professor Babette Kronstadt, and Professor Mona Huff, Dr. Stuart Varden, Dr. Frank LoSacco, Professor Joseh Dumba, Professor Susan Crawford, Dr. James Cannon, Professor Cyril Cabral, and Dr. Greg Ramsay.

All involved in the NACTEL project are learning a great deal about online education in general, and specific courses and Web and content development in particular. The work of providing high quality online education is challenging and complicated. However, it continues to provide the School of Computer Science and Information Systems with continued opportunities for faculty and staff. In addition, it continues to further the School and University missions by providing opportunities to students located throughout the United States who would otherwise be unable to continue their education.

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**DR. THOMAS JOINS CSIS FROM ABROAD**

by Louise P. Kleinbaum, Assistant Dean and Director, Academic Systems

The road to Pace travelled by Dr. Johnson Thomas, the newest member of the Information Systems Department in Westchester, is long and interesting one. Born in Somalia and raised in Botswana and Tanzania, Dr. Thomas journeyed to Great Britain for his post-secondary education. He earned a B.Sc. in electrical engineering from the University of Wales in Cardiff, U.K.; an M.Sc. in electrical engineering and computer science from the University of Edinburgh in Scotland; and a Ph.D. in computer science from the University of Reading in England.

After teaching at the University of Reading for more than 10 years, Dr. Thomas and his wife decided to come to the United States. The primary reason for emigrating was to be closer to family. Over the years, Dr. Thomas’ family had left Africa for the U.S. and his wife had lived most of her life in New York. With two young children, ages 3 and 6, they decided to make their life here.

In looking for a teaching position in the States, Dr. Thomas sought an institution that valued teaching as well as research. He felt that Pace struck the right balance that would satisfy his professional needs.

Dr. Thomas is currently teaching two undergraduate courses in business telecommunications as well as one in database management systems at the graduate level. New to teaching graduate students, he finds the experience particularly "enjoyable and challenging" because the students bring considerable cutting edge and real world experience to the classroom. Multimedia is his primary research interest. His focus is on user perception of multimedia presentations and on network architectures to support multimedia presentations.

As for his initial impression of Pace, he finds us "friendly and welcoming." When asked about the differences between teaching in England and teaching here, he promptly responded that the students he knew in England seemed to have "an easier life." Most study full-time and have their education paid for by the government. Pace students, many of whom pay for all or part of their education, appear to be "more committed because they work harder for it."

In addition to his regular teaching assignments, Dr. Thomas hopes to become involved with the new CSIS doctoral program in computing and with expanded activities in the multimedia lab in Pleasantville.
LEARNING CENTER EXPANDS INTERNET TRAINING FOR TEACHERS

by Babette Kronstadt, Director, Technology Center for Education and Community Empowerment

The Pace Computer Learning Center, in collaboration with the School of Education and Community School District #11 in the Bronx, has received a 1999-2000 Targeted Instructional Staff Development Grant from New York State. The purpose of this grant is to help teams of regular and special education teachers integrate use of the Internet into their curricula.

One of the exciting aspects of the grant is that it enables PCLC to expand on the training done with CSD #11 teachers under the Bell Atlantic Foundation grant that we have had for the last three years. Not only will we be able to work with more teachers, but each teacher involved will receive more support which should increase her/his ability to implement the new technology effectively.

Approximately 90 teachers from CSD #11 participated in Bell Atlantic funded workshops in 1999 and an additional 30 teachers plan to participate this year. The Targeted Instructional Staff Development Grant will provide training and onsite follow-up for 25 – 30 teachers from one middle school and two elementary schools in the district. The teachers will be divided into three cohorts. As with the Bell Atlantic funded program, each teacher in the second and third cohorts will participate in 30 hours of workshops conducted by PCLC staff. During the workshops the teachers will develop technical Internet skills such as efficient surfing and searching strategies, the ability to save pages and download pictures, effective bookmark organization, and the use of Composer to create Web pages. While learning these skills they will explore a wide variety of Web resources that can be used to enhance student learning. They will also consider crucial issues such as how to determine the credibility of pages, handle plagiarism and properly cite resources. As a culminating activity they will create an online lesson that effectively uses the Internet to meet the state standards.

After completion of the newly funded workshops, each teacher will receive approximately one half day of onsite consultation with a School of Education faculty member on implementation of the lesson in the classroom. Throughout the process, CSD #11 teachers, PCLC staff and School of Education faculty will participate in an online community of learners designed to facilitate exchange of ideas and development of appropriate uses of the Internet in the classroom.

Teachers in the first cohort of the new grant have already participated in the basic workshop described above. Therefore, they will participate in an additional three days of workshops designed to refine their Internet searching strategies and their ability to prepare effective lessons utilizing Internet resources. Each of the schools will have at least one representative in this group so that these teachers can provide additional support for the teachers trained in cohorts two and three. The training supported by this grant, in conjunction with the prior Bell Atlantic funded instruction should provide a base of trained teachers in District #11 who can model best practices in implementing technology to increase student learning, and who can support each other in further integration of technology into the curriculum.

CLOUT EXPANDS TO MIDTOWN CENTER

by Charlene Labenda, Assistant to the Director, CLOUT Program

The CLOUT Program, in collaboration with United Neighborhood Houses (UNH), is offering a Certificate in Computer Applications for the Office Professional at Pace University’s Midtown Center. In contrast to the Westchester programs which are funded by Westchester County’s Department of Social Services, a number of small grants have been awarded by private organizations including Citibank, W.T. Grant Foundation, Helena Rubinstein Foundation, Sumitomo Bank, United Way, Chase Manhattan, and Independence Community Foundation to fund the program. This avenue of funding was ideal for a pilot program. Since it began in November 1999, CLOUT has applied for a New York Works Block Grant from New York City’s Human Resource Administration to fund a second certificate class.

The pilot program for clients of UNH settlement houses provides computer skills and employment training to underemployed or unemployed individuals to help them develop the technological and professional skills needed to secure full-time employment and maintain financial independence. Conversation with UNH about implementing a program began in 1998. After a solid year of discussion, planning, and program design and development, CLOUT began to seek opportunities for funding of the pilot program. In mid-1999, some grant awards were received, and steps were taken to begin recruitment. Thirty-eight referrals were made by the settlement house staff members for the pilot class. Of that number, CLOUT accepted 22 individuals; another 8 were placed on a waiting list.

Participants in the certificate program receive training in a wireless lab of laptop computers. They learn the latest personal computer applications: Microsoft Word, PowerPoint, Excel and Access. E-mail, HTML and Web design instruction are also covered in-depth. To complement the applications courses, students learn how traditional office procedures and technology are merging in the workplace. Academic support seminars and employment seminars further enhance their training and help to prepare them for today’s workplace. The 280 hour internship gives participants actual work experience in the field in which they are being trained. Following the training portion of the program, job placement services and mentoring are available through CLOUT and the University Office of Cooperative Education and Career Services.

The first group of participants in the New York City certificate program are expected to complete their training in August of 2000. Over the nine months these individuals work toward their certificate, they are not only being trained for the office, but are also gaining confidence in their ability to succeed.
TRANSFORMATION OF CIS 101 INTRODUCTION TO COMPUTERS

by Dennis Anderson, Assistant Dean

"Generally, 'computer literacy' has acquired a 'skills' connotation, implying competency with a few of today's computer applications, such as word processing and e-mail. Literacy is too modest a goal in the presence of rapid change, because it lacks the necessary 'staying power.' As the technology changes by leaps and bounds, existing skills become antiquated and there is no migration path to new skills. A better solution is for the individual to plan to adapt to changes in the technology. This involves learning sufficient foundational materials to enable one to acquire new skills independently after one's formal education is complete."

Being Fluent with Information Technology
Committee on Information Technology Literacy
Computer Science and Telecommunications Board
National Research Council

CIS 101, Introduction to Computing, is a core course required of all Pace undergraduates. Approximately 900 students per semester are enrolled in 70 sections of the course. The aim of CIS 101 is to enable students to acquire conceptual understanding and operational skills in the basics of computer hardware and software. It includes actual use of common application packages and introductory programming. Fundamental concepts are covered through classroom exercises, homework, lectures and discussions. Students learn general problem-solving and communication skills and gain experience in working in teams to solve problems. They also learn to determine when it is appropriate to use computers to accomplish tasks and when it is appropriate to use systematic, analytic thinking to address problems.

Students also acquire awareness and insight into the constant presence of computer-based technology in working and everyday life during class lectures, which include discussion and analysis of current applications and potential trends. The lecture portion of the course meets two hours per week and is followed by hands-on exercises carried out in small laboratory sections. The material covered in the lab portion of the course includes programming in Visual Basic 6, spreadsheet instruction in Microsoft Excel, Webpage construction using common editors and HTML, painting programs and creating PowerPoint presentations.

As it is currently designed, CIS 101 gives students a general introduction to computing. Some recognize that students will be better served by a course that provides computing information and skills relevant to specific majors. Though students may take other courses that integrate technology into the curriculum, CIS 101 is frequently the only course strictly devoted to computing that undergraduate students will take, due to the heavy course loads they must carry to fulfill their core curriculum and major requirements.

The lecture sections of CIS 101 are now taught in classrooms that may have limited computer facilities. Instructors are sometimes unable to demonstrate hands-on exercises or access online teaching materials during lectures.

The dean appointed a Steering Committee to guide the redesign of CIS 101. The Steering Committee developed a series of recommendations which included several objectives:

1. To ensure that course content and instruction is consistent across all sections and to ensure that lecture content and lab assignments relate to advanced coursework.
2. To maximize use of resources.

The Steering Committee recommended converting the lab portion of the course to a Computer Based Training (CBT) model on an experimental basis. The model uses CD-ROMs that will be made available to students as part of their textbooks. The University has identified the support of SmartForce, a leader in technology-based education, which is donating the CD-ROMs and necessary software to be used in the proposed redesign. SmartForce, formerly CBT Systems, is widely recognized as a leader in technology-based education that works to assist educational institutions in building learning environments that integrate everything from career planning to Internet-delivered coursework, instructor-led workshops and mentoring. The CD-ROMs will contain lab assignments that have been developed in conjunction with the lectures. Students will be expected to carry out the lab assignments on their own time, using their own computers or those in the Computer Resource Centers. Approximately 80% of all Pace students have ready access to a computer outside the University's labs. For students who do not have such access, CSIS expects to set up two networked CBT labs to provide a total of 45 computers that will be available only to students in CIS 101. Each of the labs will be staffed by a graduate assistant who will be available to assist students as needed.

In Fall 2000, the Committee plans to introduce specialized modules that address the specific interests of different majors. For example, lecture sections will address the concerns of business majors through discussions on e-commerce and Web technologies. Social science majors will learn information about computer-based and Web-based research methods. History and English majors will discuss using technology to develop papers and articles, as well as to research their particular areas of interest.

The University also expects to strengthen support for faculty members by installing computers in each CIS 101 lecture room (using an NT platform), allowing professors to demonstrate hands-on exercises. Professors will be able to access teaching materials more easily and directly from the NT platform. In addition, graduate assistants who will function as tutors and graders will be assigned to each professor. This will allow the Computing Support Center to reallocate their aides to better serve students.

The transformation of CIS 101 will continue for approximately three years in order to address all the aforementioned issues. The outcome of this transformation will hopefully result in a CIS 101 that will reflect all faculty and student concerns and provide an effective and fiscally responsible model.

SAVE THE DATE!!!

JUNE 7

5th Annual Leadership and Service in Technology Award Presentation and Reception

Honoree: William D. Friel
Senior Vice President & CIO
Prudential Insurance Company of America

When: Wednesday, June 7, 2000

Where: Bloomberg
456 Avenue
New York City

Please mark your calendar and plan to attend.
HOW THE OBJECT-ORIENTED REVOLUTION WAS WON

by Dr. Allen Stix, Computer Science

To find out, the editor of Technical Reports (that’s me!) obtained special authorization from the Dean to attend the ACM’s annual meeting of 2047, the year of its 100th anniversary. (The Dean’s exact words were, “Well Allen, SCIS is going to be good to foot the bill if you can get there.”) The following is a loose reconstruction of my interview with an historian of computing. I had to find a historian because none of the other Johnny-come-latelies could believe that we had ever programmed without objects. I hope the following proves sufficient to verify my attendance and get the Dean to pay-up. To this end I’m keeping my report as factual and straightforward as possible.

Me: “Hey guy! What thrills await Y2K programmers? We do objects you know. What’s next?”

Historian: “It took the longest time for Twentieth century programmers to understand and use objects. The conceptual underpinning was in place well before 1975. The first programming language with objects, Simula, appeared in 1967. The first theoretical treatise appeared in a slim, 1972 book by three giants, Dahl, Dijkstra, and Hoare. They described all the essentials of object-based and object-oriented programming. Their work was of a formal nature. Their formal examination of programming did not uncover techniques beyond abstraction and derivation; that is, they foresaw nothing beyond objects. It is hard to call the stark reality exposed through formal inquiry prescience, but they were right. The final paradigm for software, as far as we know, is the object-oriented paradigm.”

Me: “You say it took us a long time to understand objects. You’ve got to remember that serious work was hampered by daily struggles with Windows. Every fifteen minutes my programs give me another ‘General Protection Failure’.”

Historian: “Your programs, hummm. Two obstacles made objects difficult for early practitioners to understand. First of all, like that proverbial elephant described differently by the blind men standing at different places, object technology has different facets. Some descriptions focused on objects as abstractions or as abstract data types. Others would focus on objects in terms of inheritance. Thus, people were hearing different things from different quarters. The object proselytizers in the 1980’s were not presenting a coherent picture. That their explanations relied upon analogies only made things worse. No analogy was quite right. But speaking literally was no help either. Saying that an object is a record with functions did not help non-coders; and coders could not visualize how or why such operatively dissimilar constructs might be fused.”

“Looking back, it seems that concrete code was the only effective way to communicate: (i) how classes put instance variables and functions together, (ii) that classes are data types for type-specific objects, (iii) that objects are instantiations of classes, (iv) how objects access their members, and (v) how one class inherits variables and functions from another class. C++ was very helpful in this regard. More than any other language, especially Smalltalk, it made the fundamentals of object-oriented programming accessible to professional programmers and to students. Of course, it was a nasty language in which to build real systems. Too many traps. That’s why it was abandoned so quickly. But, as I said, it was of inestimable value in displaying an object as a thing that encapsulates both data and functions and in displaying how objects are put to work. Incidentally, functions in object parlance are termed methods.”

Me: “The Dean and I wrote a book about C++. We even got a good review in IEEE Software.”

Historian: “That the fabric of C++ was not object-oriented was both a benefit and a drawback. Procedural programmers felt right at home with C++; however, the language itself neither exemplified the use of objects nor had rules compelling coders to create classes of their own. The next major language, Java, did both of these.

“But let me complete what I was saying about why objects were hard for early programmers to key into. Basically, early programmers were electrical engineering types or, at least, oriented toward bits and bytes. That, anyway, was the culture. The result was trouble dissociating the operation of the machine, at the hardware and assembly level, from the essence of a program as the symbolic manifestation of a process.

“On the machine, computation takes place with instructions such as load, store, add, branch on zero, and the like. Notice that machine instructions are verbs; each instruction signifies an action. Values, on the other hand, are inert bit strings. They sit passively in registers, in memory, or in storage. They can neither modify themselves nor, like the machine, be asked to do things.

“Early languages like FORTRAN built upon this paradigm with no explicit awareness that there could be other options. Subroutines operationalized the high level instructions one might have wished the machine had offered. Whatever a subroutine did, it was always to act: to compute a square root, to sort an array, to print a report. Data types were still inert, though the language managed them in particularized ways. A float, for instance, was stored as two separate bit strings, a value and a scaling factor. A character was an eight-bit integer that was displayed as a letter instead of as a number.

“Later languages, like PL/I, Pascal, and C, offered more sophisticated subroutines and more sophisticated data types than FORTRAN; but they did not diverge from the machine language model of computation. Instructions acted; subroutines acted. Bit strings were acted upon; variables and records were acted upon. Programmers internalized this model. So did systems analysts and systems designers. Software systems were built on the basis of the actions they would have to perform; and when an action entailed too much processing to be coded on a single page, it was decomposed into subordinate actions. Tens of thousands of otherwise fine minds were mutilated by this procedural model.”

Me: “With all due respect, the Y2K bug was the biggest non-event of the last millennium, right? If we were cognitive trash, the culprit was Jolt. You know, ‘all the sugar and twice the caffeine. I am always wired.’

Historian: “The reverence for caffeine among computing professionals was immortalized by the name of the language that turned things around, Java. In much the way that C++ was a better C, Java was an improved C++. Probably the greatest improvements were the simplifications owing to the fact that all objects were dynamically allocated and garbage was collected automatically. Along with this, all variables for objects were references (i.e. pointers that did not need to be dereferenced); assignment meant ‘copying an address’; and it was always the address of an object,
passed by value, that was transmitted to methods. Also, templates were unnecessary because all classes were 'Objects', and by that I mean derived from the class at the top of the hierarchy. Apologies if I'm getting too technical.

"While this is what attracted many C++ developers to Java, other aspects of the language made it attractive to forward-thinking educators.

"Firstly, Java provided numerous illustrations of objects at work. To take apart a string, for example, students could instantiate a StringTokenizer object. The instantiated object would be dedicated to the string passed to its constructor, such as the three word string, 'See Spot run.' The programmer could access the object's method countTokens() which would return, in this case, the integer 3. Then, to capture the leftmost sub-string, the programmer could access the object's nextToken() method. This would return the string 'See' and clip it from the string held within the object. After this, countTokens() would report that two tokens remained. The next time that nextToken() was called on this object, 'Spot' would be returned and removed from the string contained as a data member.

"More important than the StringTokenizer as a tool was the fact that it exemplified the nature of objects. A program could have any number of StringTokenizer objects. Each such object contained its own internal string about which it could answer the question, ‘How many “tokens” does your string currently hold?’ And each object could operate upon its internal string. Students were immersed in objects from early on. Through hands-on use, they intuitively understood that an object could be a software mechanism that held data (e.g. a string) and performed a specialized job (enabled its substrings to be cycled for processing). Random was another class from which students instantiated objects. Each one of these could be asked for its nextDouble(), which it computed from the values it stored for its own sequences of pseudo-randoms.

"Added to this, Java forced beginning students to create similar objects of their own. It did this by disallowing free functions. In FORTRAN, Pascal, or C where you'd have written a subroutine called sort(), in Java you'd have to design a class from which you'd declare a sorting object. This is how 'verbs' became 'nouns.' Instead of thinking in terms of sort, getCustomerName, printReport you'd think in terms of sorters, nameGetters, and reportPrinters. Little software mechanisms that performed specialized jobs.

"And the more of objects students experienced, the more apparent their versatility. An array in Java is an object. To adhere to tradition, arrays perform writes and reads from specified compartments with the bracket operator. But each array object supplements its sequence of elements with a scalar named length. Thus, when an array is passed to a method, its size goes right along as part of its corpus. This was an impressive application of encapsulation, that objects allow nouns to be better nouns."

Me: "I, myself, would have named that language Szechuan, or possibly General Tso's Chicken. You're quite a Java proponent; mind telling me how you are related to James Gosling?"

Historian: "Java had a tremendous impact. The age of modern computing dawned around the year 2000, when colleges and universities in large numbers began adopting Java as their backbone language. By the time students were sophomores, they were indoctrinated. As the wave of Java-schooled students moved into industry, the software profession was transformed. Functional decomposition gave way to thinking about systems in terms of their parts, and catalogs of reusable and customizable parts became standard."

Me: "Say no more! I'm getting bored, but my colleagues will be pleased to learn that in switching to Java from C++ they did the right thing!"

TO FORMALIZE OR NOT TO FORMALIZE?
by Dr. Sotirios Skevoulis, Computer Science

This is one of the questions that the software development industry has been trying to answer for more than 30 years. Generally speaking, "Formal Methods" (FM) consists of a set of techniques and tools based on mathematical modeling and logic that are used to specify and verify computer software requirements and design models. Traditionally, FM is considered a research area rather than an applied technology. Academic institutions and research labs have embraced FM and made it a part of their areas of high interest. During the late 60's computer scientists started placing computer program semantics on the solid ground of mathematics. The idea of not only developing correct programs but also proving their correctness mathematically has been very appealing to computer scientists. Researchers in formal methods have long sought to bring rigour and formality into the entire software development process, and to ground the process soundly on a mathematical foundation. Formal methods promise to increase the reliability of software systems, and to automate the development process. Much progress has been made in both theory and practice in recent years. Unfortunately, this progress has not had much practical impact in the sense of acceptance within the software development industry.

Although there are many reasons why formal methods have not gained acceptance, one that is rarely mentioned in the research community is that much attention has been paid to the theoretical foundations, such as notations and semantics, soundness and completeness, relative strength and weakness of various approaches, while little attention has been paid to overcoming the pragmatic obstacles of making formal methods practical and usable. Some of these obstacles include: notational barriers, front-loaded costs, and lack of adequate tools.

Currently, research in the area of formal methods within the School of Computer Science and Information Systems is targeting some of these obstacles. Innovative approaches, new techniques and tools are being developed and assessed in an effort to make formal methods more usable and to assist in their adoption by the software development industry. CSIS is becoming one of the leading centers in the worldwide effort to promote the use of formal methods.

As part of the School’s commitment to progressiveness and constant enhancement of its curriculum, work on the preparation and delivery of courses related to formal methods is currently underway. The courses will strengthen the existing courses that now teach the mathematical foundations of software development such as CS 507 Mathematical Methods in Computer Science. They will cover areas such as formal software specification and verification. Specialized tools to support the courses will be made available to students to assist them in testing, understanding and disseminating a wide spectrum of FM approaches and techniques.
by Peter Vogel, PC Network Support Analyst

Making an Emergency Repair Diskette:

You should always have an emergency repair diskette of your system in case of a critical software failure. Windows 95 and 98 come with an Emergency Repair Disk utility which will create a diskette for you. Please note that you must use a formatted, blank diskette for this procedure.

Go to the Start button and scroll up to Settings – Control Panel. In Control Panel, click Add/Remove Programs. The third tab in Add/Remove Programs should be Startup Disk. Click it and click the Create Disk radio button. The program will now copy critical files needed to boot your system to the A:\ drive. Next time your computer fails to start, pop in the diskette and boot your machine.

Windows Uninstall Program:

When you wanted to get rid of a program in the old days of DOS and Windows 3.1, it was just a matter to highlight the home directory the program was installed in and hit the delete key. If you were to do this in Windows 95, 98 or NT you will almost certainly encounter major errors. The reason for this is the famous registry mentioned earlier. When you install a program on your computer today, it will make many changes to your registry as well as to Windows. When you delete the program of your hard drive, these entries in the registry still exist and will be called the next time you boot your computer.

Luckily, Windows 95/98 and NT comes with a program uninstall utility. Simply go to the Control Panel and double click the Add/Remove Programs icon. Highlight the program you want to remove then click the Add/Remove... radio button on the bottom right of your screen. This will safely remove the program from your hard disk, remove the icons from the programs group and clean the registry of any reference of the program.

And now for FUN!!!

In Windows 98, follow these instructions:
1. In the Windows directory go to “Application Data\Microsoft\WELCOME”
2. Create a Shortcut for the file WELDATA.exe by right clicking on the file and selecting “Create Shortcut”
3. Right click on the newly created shortcut and select “Properties”
4. In the shortcut tab, add the following at the end of the “Target” edit box You_are_a_real_rascal. This causes the application WELDATA.EXE to be called with the argument “You_are_a_real_rascal”
5. Now in the “Run” combo box select “Minimized”
6. Click OK and double click the shortcut & ENJOY!

In Excel 97 for Windows, follow these instructions (this one is even better):
1. On a new Excel Worksheet, Press F5
2. Type X97:L97 and hit the enter key (or press OK)
3. Press the tab key once.
4. Now, while holding down the Ctrl-Shift key, click the Chart Wizard button.
5. Use the mouse to fly around – right button forward / left button reverse.

PACE’S NOT SO SAAAD DEANS WIN AWARD

by Ken Norz, Assistant Dean and Director, Academic Systems

Collaboration is one of the primary keys to success in a well-run organization. Pace’s Associate and Assistant Deans from the various Schools are fully aware of that and have organized themselves to meet monthly during the academic year to discuss issues of mutual concern and to collectively move the University’s academic mission forward. CSIS Assistant Deans Bernice Houle, Louise Kleinbaum, David Sachs and myself were recognized for their efforts as part of this group nicknamed SAAAD – School Associate and Assistant Deans – which has reviewed course scheduling issues, summer school offerings and information systems among other issues of common interest.

The Deans were recognized at all three of the University’s Employee Recognition Awards Ceremonies which coincided with the annual holiday celebrations. The White Plains ceremony was held on December 13, the New York ceremony on December 14 and the one in Pleasantville on December 15. Other employees, including CSIS faculty and staff, were recognized for significant anniversaries. Those recognized were:

20 years
Dr. Fred Grossman, Information Systems

15 years
Sylvia Russakoff, PCLC
Dr. David Sachs, Assistant Dean
Dr. Sylvestor Tuchy, Computer Science

10 years
Dr. Joseph Bergin, Computer Science
Dr. Richard Nemes, Computer Science
Eda Susti, Dean’s Office, Pleasantville

5 years
Linda Jo Calloway, Information Systems
Peter Vogel, Dean’s Office
Charlene Labenda, CLOUT

Special recognition also went to Nancy Lynch Hale, Chair of the Office Information Systems Department, who received the University Award for Distinguished Service, which is presented each year to a faculty member “who has shown unusual initiative or creativity in giving outstanding service to students, meeting special needs, or in contributing to the attainment of the University’s mission and goals.” Nancy has contributed much to the University, particularly with the initiation of the CLOUT and NACTEL programs, two academic programs for targeted populations, previously reported on in earlier issues of The CSIS Communiqué. Congratulations to all!
MASTER'S STUDENTS SHOOT CRAPS IN JANUARY
by Ken Norz, Assistant Dean and Director, Academic Systems

In our enthusiasm to do new things at the start of the Year 2000, we decided to alter the tried and true and offer a three week course or “mini-semester” during the January intercession making CSIS the first school at Pace to offer a course in the new millennium. Eighteen students, matriculated in the M.S. in information systems program, gave up part of their holiday break to enroll in a special topics course Programming Games in Visual Basic. This innovative course combined multimedia lab instruction with a substantial amount of online interaction.

Beginning Tuesday, January 4, Dr. Jeanine Meyer and Adjunct Professor Cathy Dwyer taught their students, who all had some programming background, advanced features of Visual Basic by having them create a variety of computer games like the dice game Craps, Tetris, and Hangman. “The best feature of this course was the games. I think it was a very good idea to use games as practice material in VB,” said one of the students in a post-course survey. The students were required to attend three classes and the professors held some optional ones that were also well attended. In between, students wrote their programs and participated in lively bulletin board discussions about the assignments. Another surveyed student said, “The professors were available online to answer questions. It actually enhanced my ability to work independently to create programs.”

The course ended on January 22. Although the compressed time period demanded constant attention, students didn’t seem to mind. “In a way it was a short time, but as I think, if you want to learn you don’t need that much time to do so. If you are not up to learning – all the time in the world can’t help you. Short periods definitely take a lot of motivation and determination from students and professors,” said one student. Another student said, “The timing and workload were all in sync. Although I had to stay up all night trying to work out a problem on one of the assignments, it was all worth it. If there were a Part II to this course I’d take it right away!” And still a third said, “I can’t believe it is over. All I have to say is WOW!! I can’t believe I read two huge text manuals and completed four programs plus two exercises and a quiz in three weeks.” The manuals that were used were actually the makings of a textbook that the professors are hoping to have published in the near future.

A remarkable 91 per cent of the students said that they would recommend the course to their friends. This word-of-mouth “thumbs up” is important because the instructors will be teaching the course again next January. The success of this initial January offering has prompted CSIS to schedule additional regular and special topics courses during next year’s holiday break.

A new semester for a new millennium!

CONGRATULATIONS ARE IN ORDER –

Several CSIS faculty members were granted tenure which goes into effect in Fall 2001. They include:

Dr. D. Paul Benjamin Computer Science New York City
Dr. M. Judith Caouette Office Information Systems New York City
Dr. Jeanine Meyer Information Systems New York City

In addition, Dr. Caouette was promoted to Associate Professor of Office Information Systems. Her new rank becomes effective in September.

Dr. D. Paul Benjamin will assume the role of Chair, Computer Science Department, New York City as of August 2000. He replaces Dr. Carol Wolf who has served for 10 years.

Susan Downey, dean’s office, and her husband Hugh are the proud grandparents of Connor John born on February 25, 2000. The baby weighed in at 7 lbs. 7 oz.

Eda Buetti, CSIS Pleasantville, and husband Anthony have been blessed with two grandchildren. Their daughter-in-law Gabriella gave birth to a 7 lb. 9 oz. baby girl on November 12 named Vanessa and their daughter Lisa also gave birth to a baby girl weighing 8 lbs. 6 oz. on February 24. The baby’s name is Lauren.

CSIS ADDS NEW FACULTY AND STAFF TO ITS RANKS

CSIS is pleased to welcome the following people who recently joined us:

Full-time Faculty
Johnson Thomas IS Westchester

Adjunct Faculty
Walter Bernstein IS New York City
Elizabeth Branca IS Westchester
Hector Guerra IS New York City
Robert Immella IS New York City
Pratpal Kocher IS Westchester
Maksim Kosyarchuk CS New York City
Yvette Lanauessa OIS Westchester
Preston Lathrop OIS New York City
Ray Le Clerc IS New York City
Raphael Lee Foon IS New York City
Seth Margolis IS New York City
Cynthia Moody OIS New York City
Ganesh Rama Swamy CS Westchester
Ali Shamoun IS New York City
Claude Turner IS New York City
Alexander Vengerov CS Westchester

Staff
Maryann Castaro PCLC Westchester
Part-time Secretary
Richard Tsui New York City

PC Support and Technology Specialist

NACTEL Project Support Staff
Gregg Ramsay, Instructor
Jai Pong, Office Assistant

CIS 101 Lab Instructors
Seema Misra New York City
Hetal Patel Westchester
Eydie Wilson New York City

Graduate Assistants
Rahul Chaudhary New York City
Eydie Wilson New York City

Student Aides
Andrew Homsi Westchester

HEARD ABOUT THE PAUL REVERE VIRUSSCAN?
IT REPORTS 1 IF BY LAN
2 IF BY C:\
FUN WITH FIBONACCI AT HONOR SOCIETY INDUCTION

by Bernice Houle, Assistant Dean and Director, Academic Systems

Q: What does a baby sleep in?
A: A crib

Q: What do you get from a Mexican take-out?
A: A taconacci.

"Bear with me, there is just one more."

Q: What is a white lie?
A: A fibonacci.

Thirty seconds of fame as a stand-up comedian were all that Dr. Joseph Malerba, computer science, needed to capture the attention of 12 newly inducted members of the Upsilon Pi Epsilon honor society and their guests. Despite the comical beginning, the presentation titled "Some new ways to look at Fibonacci numbers" ended up being a serious investigation into the many patterns found among a series of numbers. It was based on a CSIS Technical Report co-authored by Dr. Malerba and his colleague, Dr. Michael Gargano, computer science. "The Fibonacci number sequence (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...)" according to Drs. Malerba and Gargano, "plays an important role in science, mathematics and computer science. Although first considered in 1202 by Fibonacci (Leonardo of Pisa, c. 1175-1250) as a model for rabbit population growth, this pattern and its related concepts seem to consistently reappear in many diverse, interesting, and sometimes quite unexpected contexts. In computer science ... variations on the Fibonacci theme frequently occur in many situations involving data structures and related algorithmic contexts. These include Fibonacci heaps, Fibonacci merges, Fibonacci searches, and Fibonacci strings on a two letter alphabet."

Though the evening of November 22 ended with the fun of Fibonacci, it began on a serious note with the induction of 12 computer science students into the Upsilon Pi Epsilon (UPE) honor society. This year's inductees were:

Muhammad Atif Bhatti Moira Gonzales
Fe Aireen Plamo Binag Jennifer Hoffman
Svetlana Brecher Dmitry A. Kananjov
Christopher Diaz David Lindsay
Richard Erickson Bo Shen
Giovanna Fralonardo Kittipong Ungcharoen
Daria Bidnyk and Bogdan Gavriluk who were inducted last year, presided over the ceremony.

Membership in UPE is limited to candidates who can effectively uphold the formal goals of the society:
• Recognition of outstanding talent in the computing sciences
• Promotion of high scholarship in the computing sciences
• Establishment and maintenance of high standards
• Representation of the computing sciences in interdisciplinary communications
• Encouragement of individual contributions to society through the computing sciences

Founded in 1967 to recognize scholarship and professionalism, Upsilon Pi Epsilon is the only internationally recognized honor society for the computing sciences. Membership is open to undergraduate students who maintain a minimal Q.P.A. of 3.50 and have completed their core computer science courses and to graduate students who maintain a minimum Q.P.A. of 3.75 and have completed at least 12 credits of 800-level coursework.

AND THE WINNERS ARE ...

Two CSIS graduate students and an adjunct math professor in Dyson are the winners of Y2K: The Contest, an essay contest sponsored by the School of Computer Science and Information Systems. They are:

Pierre Fabinski
Adjunct Professor of Mathematics, Pleasantville
Janice Heatley, MS/IS
Susan McGee, MS/IS '00

Contest participants were asked to write a short essay predicting how the Y2K problem would surface on the 1st of the new year or early in the new millennium. The lucky winners received PALM Pilots at a celebratory event held on March 7 in White Plains.

To read these prize-winning essays, go to www.csis.pace.edu and click on Y2K Essay Contest.

(1 to r) Janice Heatley (MS/IS), Pierre Fabinski (Adjunct, Dyson), Louise Kleinbaum (Assistant Dean), and Sue McGee (MS/IS '00)
PROFESSIONAL ACTIVITIES AND PERSONAL ACCOMPLISHMENTS

Dennis Anderson, Assistant Dean, participated in the Digital Divide Summit sponsored by the U.S. Department of Commerce and attended the 8th National Policy Institute's Conference on Black Economic Advancement in the new Millennium. Both were held in Washington, D.C. He is also enrolled in the Executive Education Program in E-Commerce at the Graduate School of Business, Columbia University.

Don Booker, Information Systems, presented a poster session at the Templeton Foundation Conference at Oxford, UK where he was also gathering information in support of a grant proposal.

Judy Caouette and Susan Feather, both of the Office Information Systems department, have recently been recognized by Delta Pi Epsilon, an honorary graduate society based at N.Y.U. Judy received an award for her article "The Impact of Group Support Systems on Corporate Teams' Stages of Development" co-authored with B. N. O'Connor which was published in the Journal of Organizational Computing and Electronic Commerce deemed the best article in the discipline of office information systems in 1998. Susan is the recipient of the 1999 Outstanding Leadership Award. She serves as president of the organization and is currently serving as its national delegate. In addition, Susan's article titled "The Impact of Group Support Systems of Collaborative Learning Groups' Stages of Development," which appeared in the fall issue of the Information Technology, Learning, and Performance Journal, was nominated for an individual research award by Delta Pi Epsilon.

Michael Gargano, Computer Science, presented a paper titled "Complementary Sequences" at the Eastern Regional Conference of the National Council of Teachers of Mathematics held in Pittsburgh, PA.

Susan M. Merritt, Dean, was elected to the Board of Trustees, Siena College, Loudonville, NY.

Jeanine Meyer and Linda Anstendig (Dyson, Literature/Communications) conducted a workshop on "The Use of Images in Teaching" in Pleasantville for Pace faculty members. The workshop was funded by a grant from the National Endowment for the Humanities.

Fernuniversität Hagen, the only distance learning university in Germany, has requested permission of Narayan Murthy, Computer Science, to use his Java applets that are posted on the Web in their online data structures and algorithms course. Dr. Murthy also attended a Chairs' Conference sponsored by Kansas City University and held in Orlando, FL.

David Sachs, Assistant Dean, presented "The NACTEL Project: An Outstanding Example of Business, Labor and Education Working Together" at the CAEL '99 – Council on Adult Experiential Learning – Conference held in Seattle, WA.

Both Namchul Shin and Jennifer Thomas of the Information Systems department, attended the 30th Decision Sciences Institute Conference held in New Orleans, LA.

Sotiros Skoulakis, Computer Science, presented "Detecting Null Pointer Violations in Java Programs" and "A Generic Approach of Static Analysis for Detecting Runtime Exceptions in Java Programs" at the Twenty-Third Annual IEEE International Computer Software and Application Conference held in Phoenix, AZ. The papers will appear in the conference proceedings.

A number of CSIS faculty members attended the Organizational Systems Research Association Conference held in Toronto. Among them were Susan Feather, Office Information Systems, who moderated a session on "Building Virtual Relationships: The New Academic Reality." Nancy Hale, Office Information Systems, and Stuart Varden, Information Systems, gave a talk on "A Progress Report on the NACTEL Program: A View from the Trenches." Judy Caouette, Office Information Systems, participated in a panel discussion on Faculty Perspectives on End-User Curricula at Accredited Universities throughout the U.S. in which she highlighted the OIS Department's curriculum. Kitty Daniels, Office Information Systems, also attended.

Fall '99 Research Day was held in New York City on December 14. Samuel Epelbaum presented "Virtual Lab Experiments in Telecommunications;" Susan Feather discussed "The Impact of Group Support Systems on the Development of Groups Engaged in Collaborative Learning;" and Frank Marchese spoke on "Concept and Context in Science and Art."

Judy Caouette, Office Information Systems, was invited to speak on "Adult Learners: Opportunities and Challenges in 2000" at New York University.

Dietrich Fischer, Computer Science, presented a paper "Preventing Violent Ethnic Conflict" at the Second Annual Conflict Management Conference on "Conflict as Opportunity," held in Charleston, SC. He also lectured on "Self-Determination and Peace" at the University of Vienna, Austria and gave an intensive course on "Nonmilitary Aspects of Security" at the Peace and Development Center of Geneva, Switzerland.

STUDENT ACHIEVEMENTS

Janice Heatley, a student in the M.S. in information systems program in Westchester, had her letter to the Editor titled "Donate Y2K Supplies" published in The New York Times on January 6, 2000. In her letter, she suggested that "in the spirit of the new era, why not donate all that extra food and supplies to a homeless shelter or a community center?" Janice participated in a graduate seminar on Technological Disasters from the Tower of Babel to Y2K led by Professor Dan Farkas.

Siju Menon (BS/CS '99) has been accepted into the M.S. in computer science program at Columbia University. At graduation last May, he received the Undergraduate Student Service Award. He is also a member of Upsilon Pi Epsilon, the national computer science honor society.
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Jeanine Meyer

Sotirios Skevoulis

Sotirios Skevoulis and S. Sawant

CSIS TECHNICAL REPORTS

William Edelson and Michael L. Gargano

Susan R. Feather and Judy Caouette

Ronald Frank

Michael L. Gargano and Joseph F. Malerba

Constance Knapp and M. Barry Dumas

Somewhere, something went terribly wrong