Department of Computer and Information Sciences
State University of New York at Fredonia
Fredonia, NY 14063
2154 Fenton Hall (716) 673-4820
http://www.cs.fredonia.edu

Computer and Information Sciences News

Vol. 5 Newsletter for the Department of Computer and Information Sciences at SUNY Fredonia January 2012

Message from the Chair

Welcome to the Department of Computer and Information Sciences! We are a community of faculty and students who are excited about our dynamic discipline and how it changes people's lives. The department offers a program in computer science and one in computer information systems, each with a number of concentrations. Thus, it prepares the students for a wide range of careers or graduate studies. Our classes are small – at most 30 students – and the education is student-centered. We provide individualized advisement to all our undergraduates about the programs, course scheduling, and career opportunities.

The Department works in close collaboration with the Technology Incubator and provides many internship opportunities. We offer innovative courses on Game Development, Android, Ruby on Rails, iPhone, Windows 7 Phone, Alice, Introduction to Multimedia, Computer Security and Ethics.

Our faculty includes accomplished scholars and teachers offering a variety of courses. Department members are recipients of numerous awards such as Wilkes Award of the British Computer Society, SUNY Fredonia President's Award of Excellence, SUNY Chancellor's Award of Excellence in Scholarship, Kasling Memorial Lecture Award, and Hagan Young Scholar Award. We love to involve the students in our research activities – an opportunity that is offered primarily to graduate students at other universities and research centers.

We are proud of our alumni, who are employed nationwide as computer consultants, programmers, systems analysts, network administrators, project managers, software engineers, hardware specialists, web developers, and educators. We are working together to improve the welfare of our campus and community.

Reneta P. Barneva
Professor and Chair

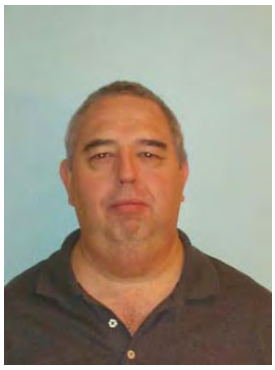
New Faculty and Faculty Promotion

The department welcomed the following faculty:

Prof. Michael Kelley joined the department in Spring'12. He will be teaching the course Game Development. Mr. Kelley is the CEO of MJK Studios – a company producing technocentric entertainment that has amassed a dedicated following and won several international awards and prizes. Mr. Kelley has been vetted by the Guinness Book of World Records for "having single-handedly developed the most art assets for a video game."

Prof. Daniel Maloney graduated from JCC Jamestown campus and transferred to SUNY Fredonia in 1997. He graduated in 1999 with a B.S. in Mathematics/Secondary Education. Mr. Maloney completed 21 hours of graduate level mathematics courses at the University of South Carolina during the 1999 - 2000 school year. From 2000 to 2007 he was a math teacher at Airport High School in West Columbia, South Carolina. He was also an adjunct professor at Columbia College from 2003 to 2007 where he taught Introductory Algebra courses. In 2010, he returned to SUNY Fredonia and in 2011 earned a M.S. in Education, Mathematics Education. He has taught courses such as Survey of Pre-Calculus, Math in Action, and Survey of Calculus I. He is currently teaching Survey of Calculus I and Discrete Mathematics II.

Prof. Paul Nippard joined SUNY Fredonia as an adjunct instructor in January, 2012. Mr. Nippard graduated in 1984 from the Department of Computer Science at Memorial University, Newfoundland, Canada, with a B.S. in Computer Science and a B.Ed. in Secondary Education. He also graduated from Bellevue University in Bellevue, Nebraska in 2005 with a Master of Business Administration degree. He has more than 25 years of experience in the Information Technology field, mostly in the Banking and Financial Services sector. He is teaching a course in Management Information Systems.



Dr. Junaid Zubairi was promoted to full professor. He received his Ph.D. and M.S. in Computer Engineering from Syracuse University and his bachelor degree in Electrical Engineering from NED University. The research interests of Dr. Zubairi are in the field of ASIC Design and Test and Network Protocols and Performance. He has taught courses in Software Engineering, Data Communications and Networks, Problem Solving with Visual C++, Computer Architecture, Introduction to Computer Science, and Computer Graphics with OpenGL.

Prof. Rob Olson was promoted to visiting instructor. He graduated from JCC and transferred to SUNY Fredonia in 2003. In 2005, he graduated with a B.S. in Computer Science (Systems Software) from the Department of Computer and Information Sciences and an M.S. in Interdisciplinary Studies (Cognitive Science) in 2007. He is teaching courses such as Introduction to Artificial Intelligence, Compiler Construction, and Theory of Computation**.**

Prof. Mike Szocki got a permanent appointment. He joined the department in Fall 2004 as a Systems Administrator with additional teaching responsibilities. He administers the department and student equipment, supervises student proctors, maintains CS 115 Lab, performs routine maintenance of the computer equipment housed in the department, faculty machines, and equipment housed in the student laboratories. Mr. Szocki teaches the courses Web Programming I and Computer Science Overview.

Scholarly Activities

Dr. Arnavut was awarded a Top Associate Editor of 2011 of the Computers and Electrical Engineering Journal (Elsevier) for exceptional contribution to the quality of Computers and Electrical Engineering.

Dr. Singh's paper "Computer Simulations of Quantum Theory of Hydrogen Atom for Natural Science Education Students in a Virtual Lab" has been selected for publication in the winter issue of the Journal of Educational Technology Systems (Volume 40, Number 3). For this scholarly work he used the latest version of MS Visual Studio. NET 2010.

Dr. Arnavut served as a guest-editor of a special issue of the journal Computers and Electrical Engineering (Elsevier), Vol. 37 (5), September 2011, devoted to image processing.

Dr. Singh together with P. Mali and A. Mukhopadhyaya published the paper "Intermittency and erraticity of charged particles produced in 28Si-Ag/Br interaction at 14.5A GeV" in the Canadian Journal of Physics, Vol. 89 (9), 949-960 (2011).

Dr. Barneva served as a guest-editor of a special issue of the journal Graphical Models (Elsevier), Vol. 73 (6), November 2011, devoted to computational modeling in imaging sciences.

Dr. Nicolescu from the University of Nevada, Reno visited the department in September 2011 and gave the talk "Vision Motion Analysis and Interpretation for Surveillance Applications" at the department seminar.

Guest-Professor Dr. Ufuktepe from Izmir University of Economics, Turkey visited the department in September 2011 sponsored by a Levin Professional Scholarship. He gave two talks at the Sigma Xi Seminar series: "Unification of Analysis: Time Scale Calculus" and "Petri Nets and Their Applications" as well as a hands-on workshop on "Computer Graphics with Mathematica."

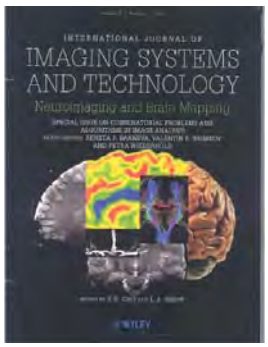
Dr. Kanev from Shizuoka University, Japan visited the department and gave the talk "Digital Marking and Encoding of Surfaces for Global Positioning and Navigation."

Four department members presented at the **SUNY Fredonia Teaching and Learning Conference** in August 2011: **Drs. Barneva, Singh** and **Prof. Cole** gave the talk "Best Teaching Practices in the Department of Computer and Information Sciences;" **Drs. Singh** and **Siddiqui** gave the talk "Pros and Cons of Collaborative Teaching/Learning Techniques in Higher Education."

Dr. Singh's paper "Role of Modern Technology in the Education of Natural Sciences, Engineering and Medical Sciences" was selected for the Technologies in Education program at the 1st Annual Technologies in Education Conference at The College of Saint Rose in Albany, NY. Together with **Dr. Siddiqui** he presented the work "Optimum Course Design Methodology for Effective Online Teaching/Learning on ANGEL Server" at the CIT-2011 conference held at SUNY Oneonta, NY. Dr. Singh has been awarded a scholarship toward the cost of the conference registration.

Dr. Barneva published two books: Combinatorial Image Analysis, Springer, Heidelberg (in collaboration with Dr. Jake Aggarwal) and Advances in Image Analysis and Applications, Research Publishing Services, Singapore.

In April 2011 **Dr. Koroutchev from Universidad Autonoma de Madrid** visited the department and gave the talk "Surface Interface with Specially Designed Figures, Based on Random Coding" at the department seminar. The talk was attended by Dean Kijinski, faculty, and students.



Dr. Barneva served as guest-editor of special issue of the International Journal on Imaging Systems and Technology (Wiley) devoted to Combinatorial Problems and Algorithms in Image Analysis.

Prof. Robert Olson gave the first talk in the Spring 2011 Social Science Colloquium Series called "Moving Beyond Naive Views in Computer Ethics" which took place on February 9, 2011. Here is a summary of his talk: "The importance of computer ethics can be clearly seen in many recent events such as the much-publicized WikiLeaks scandals. Unfortunately, these discussions are chiefly characterized by a lack of technical details that have serious implications for such ethical discussions. In this talk, ontology will be considered that includes the relevant technical details about the objects in the domain of computer science and the precise relation between them while still providing enough abstraction to make it manageable for non-specialists. In addition, specific implications for artificial intelligence and computer ethics will be discussed." The lecture was very well attended. Pizza and beverage were provided courtesy of the Dean of Arts and Sciences. Prior to the lecture Prof. Olson was interviewed by Cable Channel 8 - Jamestown and the interview was broadcast the same evening on the news.

Dr. Barneva served as guest-editor of a Theoretical Computer Science (Elsevier) special issue devoted to Issues in Image Analysis and Processing. From the

preface: "Image analysis and processing is a scientific discipline providing theoretical foundations and methods for solving problems that appear in a wide range of areas, as diverse as medicine, robotics, defense, and security. In the process of searching for efficient solutions to practical problems, researchers often face and challenge themselves by theoretical problems that are germane to important theoretical computer science issues. Among these are concerns about problem complexity, algorithm efficiency and optimality, advanced data structures for representing data, and others. Due to the very nature of the underlying practical problems in image analysis and processing, the amount of data processed is usually huge, which makes complexity and efficiency issues crucial."

Prof. Olson gave a public talk at the Department Seminar Series entitled "An Analysis of Discrete Computing Structures: Re-evaluating Implementations." The talk was very well attended. Dean's Office generously sponsored the pizza and drinks.

Curriculum Updates

Game Development

Video game development is an extremely challenging, highly technical, multi-disciplinary endeavor. This course is an introduction to the theory and practice of video game design and development. Students will be given the opportunity to create and demonstrate a simple video game.

Some of the topics covered include;

- Video game history
- Current state of the industry; publishing models
- Copyright law & legal concerns
- Game theory
- Development pipeline
- Game engines & art asset creation software.

iPhone

This course is a web based approach to content delivery focusing on Apple mobile devices. Development of mobile web sites using CSS, HTML, Javscript, and server-side scripting languages will be used to create web pages that look and act like native iPhone apps without requiring the app store for installation and use.

This approach will allow students to build applications as web sites which can be modified to support a wide variety of devices without re-creating the software for different platforms. By creating platform specific modified versions of CSS pages, one site can easily support ipads, iphones, android devices, tablets, and traditional desktop or laptop systems and browsers.

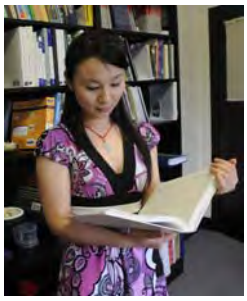
Throughout the course students will practice design and development skills while creating a full-semester project as they explore techniques used to create robust professional solutions.

Web Development Minor

In Fall 2011, a minor on Web Programming became available to Fredonia students. Web development is needed virtually for every profession: educators, writers, businessmen, musicians, scientists, etc. Many employers require such skills explicitly. The minor is organized in the framework of Web 2.0 technology allowing the users to interact and collaborate with each other. Examples of Web 2.0 include social networking sites, blogs, wikis, video sharing sites, web applications, and others.

The department received **two robots,** sponsored by the Dean. They are used in the courses CSIT 411 **Software for Embedded Microcontrollers** and CSIT 461 **Artificial Intelligence**.

Student Activities



Golden Key International Honor Society recently selected the computer science major **Zhuojun (Georgie) Fu** as the winner of the **2011 International Student Leader of the Year Award**. All Golden Key Regional Student Leader Award winners are nominated for the International Student Leader of the Year Award, but only one outstanding student is selected to receive this honor for the academic year. "It is an honor to present Zhuojun with the International Student Leader of the Year Award," said Brad Rainey, Golden Key Executive Director. "Our members are inspired and motivated not only to achieve exceptional academic accomplishments, but also to make a positive impact on our world through the Society's commitment to service."

Golden Key recognizes and encourages scholastic achievement and excellence among college and university students from all academic disciplines. The Society provides campus and community service opportunities that enable personal growth and leadership development, as well as collaborating with university faculty and administrators to develop and maintain high standards of education.

(From the web site: http://www.goldenkey.org/gk/gksite/PressReleaseDetailpageZhuojunFu_Prod.aspx)

The **Second Department Student Expo** was held on December 7, 2011. It lasted over five hours. The principal organizers were **Profs. Olson, Cole,** and **Conroe**. **Dean Kijinski** sponsored the event. The student presentations were grouped into two categories – introductory courses presentations and advanced level presentations. At noon Prof. Olson gave the talk "Digital Battlegrounds: The Technology of Cyber-War." The lecture explored a number of easily accessible software suites used by black-hat hackers and hacktivists to conduct reconnaissance over the Internet, disrupt their targets though means of DDoS attacks and "d0xing," and to evade detection by authorities. A demonstration of a DDoS attack was provided using Anonymous' infamous LOIQ software.

The Expo was very well attended. The participants enjoyed the student presentations and many informal discussions. **Ms. Collingwood** from Career Development Center spoke about the value of the internships in student career.

The **student Basar Koc,** a double major in Computer Science and Computer Information Systems and a student in the Dual Degree Program with Ege University had a presentation at the WNY Image Processing Workshop held in Rochester Institute of Technology on November 14, 2011. His presentation received the **Best Student Paper Award.** This is a big recognition, because the other presenters were graduate students. The paper, entitled "Block-sorting Transformations with Pseudo-distance Technique for Lossless Compression of Color-mapped Images," was co-authored with his advisor **Dr. Arnavut,** and was included in the conference electronic proceedings.

High school students from Brocton HS, Lake Shore BOCES, Gowanda HS, Grand Island HS, and

Chautauqua Lake HS attended the **High School Contests** held in May 2011. They participated in the Programming, Spreadsheet, HTML Contests, Scavenger Hunt, and Quiz Show. Dean Kijinski provided delicious food.

Over 50 majors and minors graduated this year among them students from Bangladesh, Congo, Kenya, and the first cohort of Turkish students in the dual degree program. Farewell! **Drs. Arnavut, Barneva, Hansen**, and **Prof. Olson** participated in the Commencement Ceremony. One alumnus wrote "Sometimes while in school I would question if everything I was learning would actually be applicable to real life situations. In the case of learning the Software Engineering process and basic principles with you it has been extremely helpful. I work a lot with programming using ASP.NET. I also code using C# and The Visual Studio components a lot. Honestly without the knowledge that I gained in school I would have a real hard time understanding the designs, concepts, and processes. I love the company I am working for and have a bright future there. It is nice to know that college afforded me the ability to do something that has meaning. Some people look down upon the SUNY education system but in actuality I work with people from a lot of big name schools MIT, Union, RPI, Penn State and for the most part I can perform on their level just the same. **I am proud to have been a student at SUNY Fredonia.**"

On May 13, 2011 the department held an **Awards and Graduation Party**.

The students **David Ballard, Jessica Codon, Georgie Fu, Daniel Lips, Marc Scapelitte, Brian Techman, and Jeremy Topolski** received various student awards. The awards were conferred by **Drs. Arnavut, Barneva, Hansen, Ruslanov, and Zubairi**.

Faculty, students, and guests enjoyed the joyful conversations and the delicious food.

On April 28, 2011 **sixteen computer and information sciences majors** presented at the Student Research and Creativity Expo. The topics varied from algorithms and data structures to data compression to robotics to language processing to networking: "Context modeling for EEG signal Compression," "Application of Psuedo-Distance Matrix to Color Mapped Image Compression," "Image Segmentation," "Comparison of Different Watermarking Techniques," "Network Routing Solutions using Dijkstra's Algorithm," "Applications of the Simplex Algorithm in Economics," "Maximum Flow Algorithm," "Optimization of Signal

Processing/Retrieval using Maximum-Weight Bipartite Matching Algorithm," "Using Lojban as an Intermediate Step in Natural Language Processing Systems," "Simulating Human Memory in Wireless Robots Using Semantic Networks," "Weight Gallery," "An Investigation into the Feasibility of Replacing Black Box with Glass Box," "Techniques to Monitor and Test for SLA Compliance in an MPLS-Diffserv Domain," "Scheduler for WiMax Base Stations," "Design and Implement a Web Portal for Medical Emergency and Disaster Situations," and "Study of Energy Efficient Link Layer Protocols for Wireless Sensor Networks." President Hefner and VPAA Horvath attended our students' presentations.

On April 15 and 16, 2011, **a student team lead by Prof. Olson attended the Sixteenth Annual Consortium for Computing Sciences in Colleges Northeastern Conference CCSCNE-2011** and participated in the student competition.

On May 7, 2011 **Prof. Cole and Drs. Zubairi and Barneva** organized a Computers Merit Badge Workshop for boy scouts. Some of the scouts met with President Hefner. The department is planning to organize such events annually.

Awards

Two faculty, **Dr. Ruslanov** and **Mr. Olson** received the first department awards "Teacher of the year for 2009-10." The awards were conferred by Dean Kijinski. In 2011, the department continued the tradition. In September, at the department picnic open to all students taking computer and information sciences, **Dr. Hansen** and **Prof. Cole** received "Teacher of the Year" Awards for AY 2010-11. The awardees are selected based on student course and instructor evaluations. Both recipients had received teaching evaluations of 5.0/5.0 in one of their courses in 2011.

SUNY Fredonia Computer and Information Sciences News

Computer and Information Sciences Endowment

The department thanks to its many alumni and sponsors who have contributed to the endowment and scholarship accounts. As the support from the state is dwindling down every year, we need more of your support to provide that margin of excellence in our programs. Your support has helped us provide scholarships and awards to deserving students. Therefore, THANK YOU and please continue your support. You can send your donations to the Fredonia Foundation's office in the name of the department.

Writer: Dr. Reneta P. Barneva
Editor: Ms. Melanie Austin
Web Site: http://www.cs.fredonia.edu/
Please send your **comments and suggestions** to Ms. Austin
Email: Melanie.Austin@fredonia.edu
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