From the Chair

The Department of Computer Science has seen growth in a number of areas over the past year. Enrollment continues to climb, with 377 students registered for fall 2017, an eight percent increase. That same semester, the new major in Software Engineering kicked off to a good start with 24 freshmen joining that program and others switching to the major later in the year.

Faculty members are developing a digital forensics curriculum to teach students to identify cyber criminals and their methods, and additional faculty have been hired to that end. A digital forensics lab is being constructed in the Mathematical Sciences Building, and we received a $56,336 grant from the National Institute of Standards and Technology (NIST) to incorporate national standards into the new curriculum and teaching tools.

A new Ph.D. degree in Data Science, developed by our department and two others at BGSU, will provide coursework in modern statistical methods, computer science, data management, and topics that cross disciplines such as machine learning and data mining. We will begin offering the program during the 2018–19 school year. BGSU’s is the first doctorate in data science in Ohio.

Space-wise, we have obtained additional offices to accommodate new faculty and our two student organizations. The computer lab and some classrooms are being remodeled to provide for better learning experiences.

After four years serving as department chair, I will be taking a yearlong administrative leave beginning fall 2018. While serving as chair is a highly rewarding job, I miss teaching, research, and working with students. I will use the opportunity to catch up with my research agenda and work on growing BGSU’s new Software Engineering program. I have arranged to visit several universities in China and Taiwan to seek potential collaboration. During my absence, Dr. Jong Kwan “Jake” Lee will be the acting chair for the department.

Sincerely,
Dr. Joseph Chao, Chair

Digital Forensics and Cybersecurity

NEW CURRICULUM INCORPORATES GOVERNMENT STANDARDS

Hacking and identity theft have created a greater need for skilled experts to track and thwart those who would commit cybercrime. The Department of Computer Science is developing curricula in line with the latest government standards to meet IT-related workforce needs.

Faculty members Drs. Yan Wu and Sankar Roy are developing a digital forensics curriculum designed to teach students to use techniques and equipment to identify cyber criminals and their methods. Additional faculty have been hired in digital forensics and cybersecurity. A digital forensics lab is being constructed in the Mathematical Sciences Building, and Wu and Roy have received a $56,336 grant from the National Institute of Standards and Technology (NIST) to incorporate national standards into the new curriculum and teaching tools.

“Digital forensics is the other side of the coin from cybersecurity,” said Wu, whose research has focused on software engineering and software assurance related to security.

Roy said, “It’s a post mortem after you’ve been attacked. You want to know where it came from, how it was successful—i.e., what were your vulnerabilities that allowed it to happen—and where is the attacker now? Those are the three big pieces.

“Typically, the attacker intentionally or unintentionally leaves a few traces behind.” he said. “Once a computer crime has been committed, police or the FBI seize electronic devices and the analysis starts. It begins with finding digital artifacts hiding in the computer, network, Wi-Fi router, or smartphone.”

Because it has become such a prominent national and international issue, the government is interested in promoting high-quality study of digital forensics and has made financial support available to educational institutions. BGSU’s grant was one of four awards NIST made this year to support standards in undergraduate and graduate curricula.

For example, for forensic reports to be deemed reliable, all equipment should meet the standards, and students should be trained in its proper use. Students will explore the theoretical aspects of digital forensics and through a series of laboratory exercises, will use forensic tools in hands-on activities that illustrate the importance of employing standardized methods to the integrity of test results.

The Computer Science department is collaborating with the Ohio Bureau of Criminal Investigation facility on campus to expand the curriculum in digital forensics and cybersecurity. If there is sufficient interest, the program could develop into a new degree in the future.
All smiles for Basia Robertson and her student mentees

Corporate Program Grows by Two

Agile Software Factory (ASF) is pleased to welcome two Megabyte-level members to the corporate membership program. Ohio Mutual Insurance Group and Townie Cup have come on board and joined these continuing members:
- Agile Oasis Technologies
- BGSU Information Technology Services
- Cisco
- Huntington
- Nationwide
- Progressive
- Property Pres Wizard

Member contributions support many facets of ASF including scholarships, student wages, hardware and software for development projects, professional training and development, and conference attendance and travel. Through collaborations with the information technology industry, Agile is able to cultivate educational and professional relationships that provide opportunities for our talented computer science students.

To participate in the Agile Software Factory Corporate Program or to engage with ASF staff, visit http://agile.bgsu.edu.

ASF Hosts Scrum Workshop

The term “scrum,” an Agile framework for managing complex projects, comes from a rugby formation in which cross-functional teams move the ball up the field. In computer science, scrum is an effective tool when rapid adaptation to change and short development cycles are needed.

In spring 2018, Agile Software Factory hosted a new “Scrum 101 Workshop” for students and select corporate members. Fifty students from “Software Engineering” and “Object-Oriented Programming” courses attended.

The event, developed and facilitated by certified Professional Scrum Master Jadwiga Carlson, included a number of team activities. The final exercise was a well-known group activity called the Marshmallow Challenge, in which participants work as a team utilizing what they have learned about scrum to build a free-standing tower using only uncooked spaghetti, masking tape, and a single marshmallow.

After the workshop, the corporate employees participated in mock interviews with the students, providing feedback on interviewing skills and other career advice.

The event, which will be offered again in fall 2018, was a benefit created in part for Progressive and BGSU IT Services, who are enrolled as ASF corporate members at the Terabyte ($5,000) level.

The winning team in the Marshmallow Challenge
New Ph.D. Offered in Data Science

The explosion of modern computing power and data acquisition techniques has created a profession known as data science, which is in high demand and growing every year. The job market seeks people with a strong background in statistical modeling coupled with computer science skills to carry out analyses on large, complex datasets and dynamic data streams.

The BGSU Department of Computer Science—along with the Department of Mathematics and Statistics, and the Department of Applied Statistics and Operations—has created a new Ph.D. degree in Data Science. The program will provide a combination of theoretical and practical coursework. Mathematical statistics probability and optimization provide the theoretical base of the program. Modern statistical methods, computer science knowledge, data management, and topics that cross disciplines such as machine learning and data mining form the curricular focus.

Ours is the first doctorate in data science in Ohio. The Computer Science department begins offering data science courses in the 2018–19 school year.

Save the Date

ANNIVERSARY CELEBRATION

Planning for the 50th anniversary celebration of the BGSU Computer Science Department is underway! Mark your calendar to join us November 2, 2019, for campus tours, presentations, opportunities to network and reminisce, and special guests and distinguished speakers from the industry.

Distinguished Professorships Awarded

Dr. Jong Kwan “Jake” Lee was named the David and Amy Fulton Endowed Associate Professor in Computer Science for three years beginning fall 2018. The professorship will provide funds to support a graduate research assistant for Lee’s project, “Exploring Machine Learning Algorithms and Visualization Methods for Characterizing Solar Features.”

The sun’s dynamic activities strongly impact the geo-space environment. For example, solar storms can damage the sensors in orbiting satellites. The research project aims to improve the understanding of the important activities on the sun by analyzing images from NASA’s Solar Dynamic Observatory satellite mission. Specifically, the project will investigate novel machine learning algorithms to automatically detect features of interest and new visualization methods to better describe changes in solar data over time.

The Fulton Endowed Professorship is an ongoing grant for Computer Science departmental projects.

Dr. Joseph Chao, associate professor and department chair, was named the inaugural Shantanu and Reni Narayen Endowed Professor for a three-year term beginning fall 2017. Under Chao’s leadership, the department developed a software engineering curriculum and a new bachelor of science degree. BGSU’s is currently only the second software engineering bachelor’s program among public universities in Ohio. The professorship allows him to focus on student recruitment, program expansion, and strategic planning for the future.

The fund is named for prominent BGSU alumni Shantanu and Reni Narayen. Shantanu is president and CEO of Adobe Systems Inc., one of the world’s largest software brands. Reni serves on the Board of the Maitri Organization in San Francisco.
**Code4her Reboot**

As of spring 2018, more than 100 girls in grades 5–8 from northwest Ohio participated in the popular Code4her program. A new curriculum for the third installment, utilizing Sphero SPRK+ robots, was developed by senior student Rebecca Knoop under the direction of senior lecturer and the program’s founder Jadwiga Carlson. Because of their active involvement in computer science initiatives for females, Carlson and Knoop both received a 2018 BGSU Women of Distinction award which recognizes those who demonstrate excellence, ingenuity, and the ability to overcome barriers that exist for women.

Code4her 2.0—a week-long camp for girls in grades 9–12—launches in summer 2018. The more intensive program, focused on computer science principles, will explore topics like programming with C++ and webpage development.

The Miller family continues to support Code4her with much-needed donations to help keep the program running.

**New and Departing Faculty**

**New Hires**

**CAROL BUSER**
Ms. Carol Buser joins the department as a new full-time faculty in fall 2018. She is a highly experienced teacher with a strong teaching record. She joined us as an adjunct faculty in 2005, and was a professor at Owens Community College for 15 years. She is very familiar with our curriculum and has already started to work on projects with other faculty in the department.

**MICHAEL DECKER**
Dr. Michael Decker joined the department as a tenure-track faculty in fall 2017. He received his Ph.D. in computer science with a specialization in software engineering from Kent State University. His research interests encompass software engineering including static program analysis and software maintenance/evolution. He is a lead developer of the srcML infrastructure which is used by researchers and industry practitioners worldwide for analysis, exploration, and transformation of source code.

**RUINIAN LI**
Dr. Ruinian Li joins the department as a new tenure-track faculty in fall 2018. He received his Ph.D. in computer science from The George Washington University in 2018. He is an expert in security and his research interests include Internet of Things (IoT), network security, applied cryptography, privacy-aware computing, and blockchain technology.

**TIANYI SONG**
Dr. Tianyi Song joins the department as a new full-time faculty in fall 2018. She received her Ph.D. in computer science from The George Washington University in 2017. Her research interests include secure and privacy-aware computing for Internet of Things (IoT), mobile computing, and wireless networking. She previously taught Java programming, internetworking, computer architecture, and development of IoT at Marshall University.

**Retirement**

**WINNIE REX**
Ms. Winnie Rex is scheduled to retire after this summer. Many congratulations to her and great appreciation for her dedication in supporting the department for so many years.