I’d like to introduce myself as the new chair of the Department of Computer Science at Western Michigan University. I have come to WMU after serving as a professor at Michigan Technological University for 19 years. During my short time here, I have truly been impressed with the quality of students, faculty and staff within the Department of Computer Science.

I would like to make you aware of a number of changes that the Department of Computer Science has made recently. First, due to changes in the requirement for accreditation, we have eliminated the Computer Science General Option and are now offering a significantly modified, single Computer Science degree. This new degree meets accreditation requirements, but offers significantly more freedom than the Theory and Analysis Option. In addition, based upon feedback from our Industrial Advisory Board, we have required all students to take a course in database.

Second, we have added a new option to substitute for the one-year senior design sequence. We have created the option for students to partake in a three-year design experience focused on a particular topic. The goal is for students to work on more long-term projects with industry and get experience not only working on the technical aspects of the project, but also the managerial aspects. We expect this new option will give students a more sustained real-world-like experience during their studies. Although the new option will require more work and credits than the current senior design, we believe that students will like the opportunity to work in a business-like environment. By Fall 2013, we hope to start a long-term project in network security led by Dr. John Kapenga. We expect this opportunity, and others like it, to help provide our students an excellent hands-on education in computer science.

Even though we have made significant changes in the last year, we are not done improving the quality of our programs. Being in a dynamic discipline like computer science, not progressing means one is falling behind. Within the next year, we hope to add a degree in information technology. This degree will focus on web technology and systems administration, while stressing computer and network security throughout the curriculum. We expect this degree to be in high demand and fulfill a significant need in the current job market. Our goal is to have this degree accredited after the first graduates (a requirement of accreditation) and to work closely with industry professionals to make sure that the content of the curriculum satisfies the needs of industry.

As part of my getting acclimated to WMU, I would love to hear from you regarding your experiences with your CS degree. What do you think were the strengths and weaknesses of your preparation? What would you like to see done differently? What real-world-type experiences do you wish you had before you graduated? You can contact me at steve.carr@wmich.edu with your comments, or if you wish to remain anonymous, you may send a letter to the Department of Computer Science office.

My first year as chair of Computer Science has been filled with positive changes. I am confident that my subsequent years will continue to be filled with new developments and growth in our curricula. As chair of the Department of Computer Science, I wish you the best in your career and hope that the changes we make will only enhance the value of your degree.
Spring 2013

Special Section Honoring Spring 2013 Computer Science Award Winners

Two Students Honored as Department Research and Creative Scholars

Rida Assaf

Rida Assaf, a Master’s student, was honored with the 2012-13 Department Graduate Research and Creative Scholar Award. Rida started as an MS Computer Science student in the Fall 2012 semester. He came to WMU on the recommendation of a former Computer Science Ph.D. graduate, who is currently a professor at the American University in Beirut.

Rida took Parallel Computations (CS 5260) course taught by Dr. Elise deDoncker, who reports that Rida participates actively in class and has excellent test results. “Even though the parallel computing environment was new to everyone in the course, Rida demonstrated innovative and thoughtful approaches in solving the problems and programming,” says Dr. deDoncker.

“Rida took on a project in my research area, and because his results contributed to my research, he co-authored an article with me,” says Dr. deDoncker. The article was submitted to the Journal of Physics: Conference Series, and since Rida has collaborated on two more articles. His contribution will furthermore help make our software available in the C programming language, thus increasing its visibility.

Rida also assisted Dr. deDoncker with the CUDA Teaching Center (CTC), where his tasks included the preparation of materials for the CTC seminars. The CTC was awarded earlier last year. The two cohorts have several research projects outlined for the near future, which will enhance the work and visibility of the CS department’s High Performance Computational Science Laboratory (HPCS) established as result of federal funding from the National Science Foundation.

Jeremy B. Mange

Another 2012-13 Department Graduate Research and Creative Scholar Award winner is Jeremy B Mange, who earned his Ph.D. in 2013. Jeremy’s dissertation was entitled Artificial Immune Systems and Particle Swarm Optimization for Solutions to the General Adversarial Agents Problem. Jeremy earned his BS and MS Degrees in Computer Science, respectively, from Taylor University, Upland, IN, in 2004, and California State University, Northridge, CA, in 2006.

His internship experience involved all activities of the Data Analysis and Optimization team while working for TARDEC during the summers of 2010-2012. Jeremy’s duties included analyzing vehicle data to make determinations based on customer direction. He also co-authored two successful Innovation Grant (IG) and In-house Laboratory Independent Research (ILIR) project proposals and participated in project research.

As a teaching assistant Jeremy has taught Web Page Design (CS 2100) and Computer Science II (CS 1120) labs at WMU. He was responsible for course design of the web design course, including lectures, assignments, tests, grading, office hours and interaction with students.

Jeremy’s experience also features web application and database programming for Tradewinds, LLC, from 2006-2008. There he created both internal and external custom database-driven web applications, and provided customer support for application updates and customer training as necessary. His work as a computer science researcher for the US Army Research - Tank Automotive Research, Development, and Engineering Center also allowed him to perform data analysis and optimization tasks in support of US Army ground vehicle systems, receive multiple individual and research team grants for independent research projects and conduct fundamental numerical and scientific computing research and development.

Jeremy has also co-authored six research publication articles and conference proceedings with his advisor Dr. Dionysios Kountanis and other researchers on such topics as the design of diagnostic algorithms, artificial immune systems and nonlinear programming.

CS Students Presented Department Graduate Teaching Effectiveness Awards

Thomas L. Lake

Master’s student Thomas Lake was named a winner of the Department Graduate Teaching Effectiveness Award, largely based on his ability to “reach out to help students,” according to his course supervisor Dr. Ala Al-Fuqaha. Thomas got these accolades for his teaching of Programming in Python (CS 2100) for more than a year. Thomas gets a lot of positive feedback about his teaching style and his influence on students starting their academic path in the computer science field. Some of the actual student comments about Thomas’ outstanding teaching are:

- “Very knowledgeable in the Python programming language. Easy to talk to.”
- “Has a great deal of knowledge on the subject.”
- “Instructor is very knowledgeable about the subject matter, and was able to display the information multiple ways to
David Rodriguez

The Department Graduate Teaching Effectiveness Award was also presented to Ph.D. candidate David Rodriguez-Velazquez for his utmost professionalism, extreme responsibility, and demonstrated excellence in performance. According to Dr. Donna Kaminski, a course supervisor, “David has taught CS1110 labs for a number of semesters, where the course team of usually three faculty members, three teaching assistants, and three doctoral students plan the course experience. As part of that role, David has flexibly accommodated the various faculty’s ideas of course design and pacing of programming activities.

“David has done an excellent job each semester, always adapting to the new team … cheerfully, tactfully and professionally. Students often report how much they appreciated his teaching style, how he facilitates their interest/effort and the class experience,” continues Dr. Kaminski.

But a Summer offering of the CS1110 course last year best showcases David’s teaching talents. “David designed his weekly quizzes as tiny practice programs that students had to complete on the spot to reinforce content material covered previously. He also designed his lab exercises as mini-programming challenges which were core building blocks for their homework programming projects. David was a true partner and co-designer of the course that semester, which demystifies his extensive knowledge and skills as a teacher and computing professional,” reports Dr. Kaminski.

Upon his arrival at WMU in 2006, David began his teaching skills development in CS 1000 labs, using his outstanding interpersonal skills to enhance classroom instruction. He challenged his students to take responsibility for their learning of computing techniques and attain 4+ ratings on his student evaluations, reports Ron Miller, his supervising instructor.

In CS 1000 labs David utilized projector demonstrations to show computer techniques to students, followed by student hands-on application of the functions to fortify learning. He used the SychronEyes program to transfer the teacher station’s screen to every student’s computer monitor during the demonstration of the functions, and then turned the program off to let students try the application techniques themselves. David also used GoWMU Elearning to add 2-3 steps to standard lab assignments so students got more practice on the more difficult functions of the software.

“David also assisted me in preparing the pilot lab for the new course, Programming Logic & Design (CS 1106), during its development,” says Mr. Miller. “In this CS majors lab, David helped create a 5-part lesson plan of slides, programming assignments and quizzes for teaching program design, flowcharting, variables, arguments, programming structures, arrays and sorting.”

David expresses his teaching approaches this way: “When preparing for lectures and lab sessions, I place a high priority on the preparation of materials that will help and satisfy the diverse student population typically found in entry-level programming courses. It is not that uncommon to find students on each end of the spectrum; students with limited exposure to computer programming and those who are coming back to school after many years as compared to those with considerable computer programming experience during their precollege years or have great intellectual capabilities. Similarly, the different learning styles of students, … present interesting challenges to teaching programming.”

He continues, “During my preparations I find different ways to present the same material. I develop exercises that address specific aspects of programming procedures and serve as building blocks for the challenging homework. The proper tool might well be a timely answer to questions or feedback, which … might serve some students, but based on my experience as a student and as a teacher, showing respect and patience when helping the students is a must, no exceptions.”

Mohammad Ali Salahuddin

The Department Graduate Teaching Effectiveness Award was also awarded to Mohammad Ali Salahuddin, a Doctoral candidate, for his flexible teaching skills. Dr. Mark Kerstetter recalls, “At the time when CS 1110 was being changed in major ways to update the material and to make the course more effective, Ali effectively implemented these changes in the labs. The changes required new approaches in content and delivery. He showed great flexibility in adapting to change and in showing his personal initiative and concern to his students.”

A different programming language, C#, was introduced to the course. Pair programming was also new to the course as were hands-on programming lab tests. Rubric grading was introduced for scoring programming assignments and lab tests.

Pair programming in CS 1110 required two students to learn specific roles, like the driver of a car and like a navigator. Students switch roles at specified intervals throughout the lab and learn from each other. Ali instructed the students in pair programming, mentored students in the different roles, answered their questions, and encouraged and monitored progress while they wrote their programs. As Ali became more experienced he taught the teaching techniques to other graduate assistant lab instructors.

Ali worked with Dr. Kerstetter to implement and improve the grading rubric. Dr. Kerstetter says, “He was one of the first teaching assistants in our department to grade programs using a rubric. Ali’s student teaching evaluations have always been very good. Students report that he is knowledgeable, able to explain and resolve problems in manner they can understand, and is concerned with student welfare and success. Ali assigns grades fairly, handles student concerns well and his grade distributions are reasonable.”

If another lab instructor needed to miss a lab, Ali was the first to offer to substitute, and furthermore, Ali even instructed several lectures when Dr. Kerstetter traveled to conferences.
2013 Computer Science Awards Ceremony

The Eighteenth Annual Computer Science Awards Ceremony took place in the Parkview Room of the College of Engineering & Applied Sciences Parkview Campus on April 11, 2013. The ceremony began with welcoming remarks by Dr. Steve Carr, Chair of the Department of Computer Science. The award recipients for 2012-2013 are listed below.

Undergraduate Honor Roll
Recognition to students who have achieved a 3.40 GPA in all university courses and who have a GPA of at least 3.90 (highest honors), 3.70 (high honors), or 3.50 (honors) in computer science courses.

SOPHOMORES: High Honors:
Iain C. MacQuarrie, Seth O. Rachwitz

JUNIORS:
Highest Honors:
Lars C. Höffbeck, Tracy C. Ondracek
High Honors:
Nicholas S. Breuer, Justin D. Hill
Honors:
Joshua L. Inniger, Andrew F. Ladd, David Edwardo Charles Martinez, Marissa L. Morgan, Zachariah A. Ruppert, Erik D. Swan

SENIORS:
Highest Honors:
Claudy Manuel Mejia Rodriguez
High Honors:
David J. Barnes, Taylor R. Keenan, Matthew D. Layher, Andrew M. Stratton, John J. Treadway, Michael J. Wickey
Honors:
Timothy Weidner

College of Engineering and Applied Science Dean’s Outstanding Seniors
Selected by the Dean of the College of Engineering & Applied Sciences for academic achievement.

RECIPIENTS: John J. Treadway (CST)
Timothy C. Weidner (CSG)

Dr. Steve Carr presented the Outstanding Senior Major CST Award to John Treadway.

Outstanding Senior Major CSG Awards
Presented to a senior major in each program for outstanding achievement as judged by the faculty and Computer Science Undergraduate Committee.

RECIPIENTS: John J. Treadway (CST)
David J. Barnes (CSG), Matthew D. Layher (CSG), Michael J. Wickey (CSG)

Dr. Steve Carr presented the Outstanding Senior Major CST Award to John Treadway.

Graduation with Honors in Computer Science
Awarded to recognize achievement beyond the normal major program to students who have maintained a 3.70 GPA in computer science and a 3.50 GPA in overall university studies. The phrase “Graduation with Honors in Computer Science” will be affixed to each student’s official transcript upon graduation.

RECIPIENTS: David J. Barnes, Matthew J. Layher, Claudy Manuel Mejia Rodriguez, Andrew M. Stratton, John J. Treadway, Michael J. Wickey

Pictured at the left, Dr. Anthony Vizzini, CEAS Dean, presented Timothy Weidner with the Dean’s Outstanding Senior CSG Award. Tim’s chosen supporting faculty member is Dr. Robert Trenary, pictured to the right.
Faculty Undergraduate Scholarship
Awarded to a computer science major who is not yet a senior, to recognize outstanding promise and to encourage the development of that promise, as judged by the Computer Science Undergraduate Committee.

RECIPIENTS: Lars C. Hoffbeck, Tracy C. Ondracek

James Sleep Memorial Award
Presented to a student or group of students who develop a significant project helpful to the community (department, university, off-campus, or utility for a course or research).

RECIPIENTS: Justin D. Hill, Matthew D. Layher, Eric J. Leese

Bayliss Scholarship
Presented to the outstanding new computer science majors who graduated from Michigan High Schools. Selection is based upon excellent ACT scores, high GPA in high school and current GPA.

RECIPIENTS: Josiah S. Boswell, Zachary T. Frid, Zachary P. Hummel, Zachary M. Orr, Paul M. VanderVeele (2012-2013)

Department Graduate Research and Creative Scholar
This designation is bestowed by the Graduate College in recognition of scholarly research or creative activity as judged by the Computer Science Graduate Committee.

RECIPIENT: Jeremy Mange (Doctoral) 
Rida Assaf (Masters)

Excellence in Research Award
Presented to graduate students who have authored or co-authored at least one full length refereed paper published, or accepted for publication, in a technical computer science journal or conference proceedings.

Rida Assaf, Peter M. Holvenstot (Masters)

Department Teaching Effectiveness Award
This designation is bestowed by the Graduate College in recognition of excellence in the classroom or to promote learning as judged by the Computer Science Graduate Committee.

RECIPIENT: David Rodriguez Velazquez, Mohammad A. Salahuddin (Doctoral) Thomas L. Lake (Masters)

Graduate Honor Roll
Recognition of students who have completed three or more graduate courses and who have achieved a grade point average of 3.75 in computer science graduate courses.


Outstanding Graduate Student Awards
Nominated by a department faculty member and selected by the Computer Science Graduate Committee, based on academic achievement.

RECIPIENTS: Hector M. Chavez Chavez, Ammar M. Kamel (Doctoral)
Tyler C. Ondracek, Jason A. Wengert (Masters)

Outstanding Service Award
Presented to a graduate assistant and an undergraduate in recognition of excellence in teaching or in the performance of other activities beyond what is normally expected.

RECIPIENTS: Jason E. Johnson (Graduate)
Nicholas S. Breuer (Undergraduate)

Outstanding Service Award
Jason Johnson, left, received the Outstanding Service Award for special computer support during his Masters program from Dr. Steve Carr.
CS1000 Teaching Effectiveness Award

Recipients are determined based on student evaluations, in-classroom observations, recommendations from the course coordinator and other students.

RECIPIENTS: Vinay B. Gavirangaswamy, Vidit Gupta, Chung-Ling Lin

Department Teaching, Research and Support Assistants

The faculty and staff of the Department of Computer Science wish to thank the following assistants for their efforts in teaching, research, grading and lab support during the past year.


CS Students Present Posters at Research and Creative Activities Poster Day

Beginning top left and clockwise: “Adaptive Task Partitioning in Parint” by Omofolakunmi Olagbemi; “Monte Carlo Simulations in GPUs” by Rida Assaf; “Identifying Overexpression of Genes in Cancerous Colorectal Tissue” by Sandino N. Vargas Perez; “Role of Traffic Prediction in Intelligent Transportation Systems” by Vinay Gavirangaswamy; and “Overview of Cloud Computing Security” by Madhuri Revalla. CS faculty Dr. Elise deDoncker sponsored the participation of Omofolakunmi, Rida and Sandino. Dr. Ajay Gupta, Director of Graduate Programs, sponsored the participation of Vinay and Madhuri.
Join the Department of Computer Science Team

Your tax-deductible contributions to the Department of Computer Science Fund will help the department to expand its tradition of excellence in education. Your gifts will enable more student involvement in research, conferences, and programming experiences, as well as enhanced development of the computer science programs.

Yes, I/we would like to support the continued excellence of the WMU Department of Computer Science with the following gift:

☐ $1,000 ☐ $500 ☐ $250 ☐ $100 ☐ $50
☐ Other Amount _________________

Gift Selection
My/Our gift should be used as follows:

$________ to support Undergraduate CS Scholarships.
$________ to support student attendance at conferences and programming competitions.
$________ to support the area of greatest need in the Department of Computer Science.
$________ to support the area specified on the line below:

__________________________________  __________________________________

Many companies have matching gift programs that can double or triple your gift.

Have you enclosed a matching gift form?
☐ Yes ☐ No

Check Payment
Please make checks payable to the WMU Foundation and write “Department of Computer Science Fund” on your check. Send it to:

Western Michigan University
WMU Foundation
1903 W. Michigan Avenue
Kalamazoo, MI 49008-5403

Credit Card Payment
Please charge my/our gift to (check one):
☐ VISA ☐ MasterCard ☐ Discover

Account #

Expiration Date

Signature(s) Required

Please mail the top portion to the WMU Foundation.

Date Mailed: ___________________________

☐ I/We have enclosed a matching gift form?
☐ Yes ☐ No

☐ I/We paid with Check
Check was made payable to the WMU Foundation with “Department of Computer Science Fund” written on the check. It was mailed to:

Western Michigan University
WMU Foundation
1903 W. Michigan Avenue
Kalamazoo, MI 49008-5403

☐ I/We paid with Credit Card
☐ I/We charged my/our gift to (check one):
☐ VISA ☐ MasterCard ☐ Discover

Account #

Expiration Date

Signature(s)
CS Students Present Systems at Senior Engineering Design Projects Days

52\textsuperscript{nd} Conference

Seventeen Senior CS students presented their team projects at the 52\textsuperscript{nd} Conference on Senior Engineering Design Projects held December, 2008. The systems of the four Senior project teams were presented to visiting clients, students, parents, and faculty. The faculty advisor of the Fall 2013 Senior core courses, CS 4900 and CS 4910, was Dr. John Kapenga. Synopses of the projects are described here.

Inverted Classroom Webcast Workflow and Distribution

\textit{Developed by Justin Hill, Matt Layher and Eric Leese}

\textbf{Sponsors:} Dr. John Kapenga

\textbf{Faculty Advisor:} Dr. John Kapenga

The inverted classroom learning model proposes having students view lecture material outside of class. When students enter the classroom, they are given hands-on projects to work on and are assisted by the instructor. A workflow provides guidelines for using several recommended tools and software packages to both create the tutorials and make them accessible for students to view. An online quiz system was also put in place to provide the instructor with feedback about which topics might be covered in more depth.

Temperature External Surveillance Tracking System

\textit{Developed by Andrew Wagner and Daniel Yap}

\textbf{Sponsor:} Dr. John Kapenga and Eric Johnson

\textbf{Faculty Advisor:} Dr. John Kapenga

Server cooling failures are an extremely costly emergency situation if they are allowed to go unnoticed. A TEMPEST system are designed to communicate with the temperature sensors on site at WMU, in order to track the individual temperatures of each sensor. It would allow an easy interface to check all the current sensor data, as well as offer graphical representations. Furthermore, the TEMPEST system would notify WMU staff should any sensors fail to communicate its status. The TEMPEST system would be able to scale with WMU’s future sensor needs and will act as an extra line for defense against cooling failures.

Audience Response Clicker Project

\textit{Developed by Taylor Keenan and Joseph Meyer}

\textbf{Sponsor:} Dr. John Kapenga

\textbf{Faculty Advisors:} Dr. John Kapenga

Active learning has become increasingly popular at universities in the United States. A cross-browser compatible web application was created to allow faculty and staff of Western Michigan University to implement active learning through an audience polling system. The application facilitates the construction of surveys and records individual audience member responses as they are received from any device with a web connection.

Senior Design Hub

\textit{Developed by Michael Grondin and Jason Leyanna}

\textbf{Faculty Advisor:} Dr. Ala Al-Fuqaha

There are many sponsors that benefit from contribution from engineering students and senior design projects. Senior
Design Project Hub is a web service that helps connect Western Michigan University engineering and applied science students to sponsors with projects. The service provides students with a greater selection of projects. It also gives potential sponsors the opportunity to discover the senior design students. Senior design faculty can use tools to control the flow of projects by granting permissions and approving projects if they choose. Senior Design Project Hub streamlines the project selection process for students, faculty, and sponsors.

Hockey Daemon: Stat Tracking Software
Developed by Brian Blake and Jonathan Siterlet
Sponsor: Teresa Quiggle, Eagles Ice Center
Faculty Advisor: Dr. John Kapenga

You may be surprised to learn that ice arenas are typically one of the slowest adopters of technology. Besides missing things like wi-fi and a website, the extent of their stat keeping usually ends at a piece of paper tacked onto the bulletin board at the front of the rink. Hockey Daemon solves this issue. It is a stat tracking technology built specifically for hockey. It can run on any type of device with a browser and makes scorekeeping and league administration a breeze. For a relatively low cost, rinks can now host their stats and leagues online, hassle free.

Sunseeker CAN Bus Utility
Developed by George Barry, James Dilts and Kyle Noll
Sponsor: Brad Bazuin
Faculty Advisor: Brad Bazuin

It is extremely difficult to make a useful analysis of a car’s systems using CAN messages, especially when there are several thousand messages being transmitted every second. A utility was created to monitor, log, filter, interpret and send CAN messages using CANUSB hardware. The utility is compatible with Linux and Windows operating systems utilizing the D2XX driver from FTDI. The software utility and its many tools empower a user to more easily isolate and interpret the pertinent Can messages and make proper and immediate systems analysis.

The Kohler Company Internal Time Reporting System
Developed by Ian Kane, Matt Mackie and Mike Wolfe
Sponsor: Mike Radloff, Kohler Company
Faculty Advisor: Dr. John Kapenga

As an international company with multi-departmental endeavors, The Kohler Company requires a sophisticated project management and reporting system. In order to replace an out-of-date and functionally decrepit time reporting system, a new system was put in place to allow for integration with current systems and extensibility for the future. The new solution utilizes ColdFusion to meet Kohler’s needs for employees to track hours worked across multiple projects of various scales. This solution provides a simplified work flow that allows managers and employees alike to track their productivity and accomplish their tasks.
Tell Us about Yourself

As a graduate of the Department of Computer Science, we would like to know about your career and what you have done since your graduation from Western Michigan University. Please complete the information below and mail this form to: Ronald A. Miller, CS Bits & Bytes Editor, Department of Computer Science, College of Engineering & Applied Sciences, Western Michigan University, 1903 West Michigan Ave., Kalamazoo, MI 49008-5466

Name: ........................................ Class of: .............. Degree: ........................................

Home Address: ........................................ City: ........................................

State: ............... Zip: ............... Email Address: ........................................

Current Position and Title: ........................................

Business Address: ........................................

City: ........................................ State: ............... Zip: ...............  

News Item Information (title, duties and other significant accomplishments)

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May we publish this information in a future CS Bits & Bytes Newsletter?  Yes  __  No  __

(Please feel free to use additional sheets when including information about yourself or other Western Michigan University computer science alumni with whom you have contact.)