



COMPUTER SCIENCE DEPARTMENT NEWSLETTER

Dec. 2011

Message from the Chair

Dear CS alumni, friends, and colleagues:

I'm pleased to write this letter to share with you some of the exciting news and activities that happened in the Fall semester of 2011. First, I'm very happy to announce that two new faculty members, Dr. Sarita Bassil and Dr. Tingjian Ge, will join the department in the Spring semester of 2012. We are still searching to fill one (possibly two) tenure-track or tenured position, which is open at all ranks.

Dr. Bassil received her PhD in Computer Science from the University of Montreal in 2006. She was a tenure-track assistant professor at Marshall University in West Virginia before she moved to New Hampshire with her family. Dr. Bassil has substantial experience in teaching undergraduate programming courses and the software engineering course. She is joining us as a non-tenure-track Lecturer.

Dr. Ge received his PhD in Computer Science from Brown University in 2009 and has been a tenure-track assistant professor in the Department of Computer Science at the University of Kentucky in Lexington. Dr. Ge does research in databases, and he has been widely regarded a rising star in the field. He will bring with him an NSF research grant in the amount of over \$300K and two PhD students. Dr. Ge is joining us as a tenure-track assistant professor.

Dr. Cindy Chen and her PhD student have built a database system to

streamline the process of graduate-student advising and course signups. This system will make it easier for graduate students to sign up for courses and help the department to better keep track the progress of graduate students.

Dr. Jesse Heines and Dr. Benyuan Liu both had a fruitful sabbatical leaves this semester. Dr. Cindy Chen is taking a sabbatical leave in the Spring semester of 2012 and Dr. Liu will be acting Graduate Coordinator while she is away.

Dr. Giampiero Pecelli retired in May 2011. The department celebrated his retirement in the Massachusetts International Academy (MAIA) with a nice Italian dinner and other activities. Thank you, Giam, for many years of valuable service and contributions to the department, the university, and the research communities.

The UML-CERNET premaster admission program that I started two years ago continues to grow. This year, about 70 students from China were accepted to the program and over 50 students came to MAIA in the Fall semester to receive English training. Among them, there are 18 Computer Science students, 13 Engineering students (Computer Engineering, Electrical Engineering, Civil Engineering, and Chemical Engineering), 12 MBA students, and a few Biology/Biotech and Physics students. Their task at MAIA is to study English and obtain satisfactory TOEFL and GRE/GMAT scores. Some of the students will officially enroll in UMass Lowell in the

Spring semester of 2012, and the rest are expected to enroll in the Fall semester of 2012.

In October 2011, I organized and accompanied (as Director of China Partnerships) Chancellor Marty Meehan and Provost Ahmed Abdelal to visit Beijing, Shanghai, and Xi'an to further our collaborations with various universities and organizations in China. More details about this trip can be found in the newsletter.


The newsletter includes exciting items on faculty research activities and student achievements. I am sure you will enjoy reading them as much as I did.

I am eager to hear from you about your achievements, thoughts, concerns, and suggestions on how to strengthen the UMass Lowell Computer Science Department for our students. I believe that a strong department will, in turn, help our alumni and make them feel proud of being graduates of our programs. If you would like to offer financial support to the department or to a specific program in the department, please specify that on your donation form.

Yours sincerely,

A handwritten signature in black ink that reads 'Jie Wang'.

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Prof. Jie Wang (Director of China Partnerships of UMass Lowell) organized and accompanied Chancellor Marty Meehan, Provost Ahmed Abdelal, and Vice Provost for Research Julie Chen to visit China

Prof. Jie Wang (Director of China Partnerships of UMass Lowell) organized and accompanied Chancellor Marty Meehan, Provost Ahmed Abdelal, and Vice Provost for Research Julie Chen to visit China from October 17 to October 26, 2010. The UMass delegations visited (in order) Tsinghua University, CERNET Education, Beijing University of Posts and Telecommunications (BUPT), Orient HuaFa Enterprise Development, University of Shanghai for Science and Technology, Northwest University (NWU), and Xi'an Jiaotong University (XJTU). The UML delegation discussed with these organizations collaboration opportunities. Chancellor Meehan signed collaboration agreements with BUPT, NWU, and XJTU.

In July, August and September of 2011, Dr. Jie Wang organized workshops for, respectively, a delegation of CEOs from Sichuan Province, a summer camp of middle and high school students from the City of Shenzhen, and a delegation of middle-level managers from BUPT. Meanwhile, Dr. Wang is leading the efforts of UMass Lowell in the newly established New England Advanced Cyber Security Center (ACSC).

Dr. Wang (with Dr. Wayne Bureson at UMass Amherst) received a science and technology development grant of \$60K from UMass President's Office in December 2011.

In September, October, November, and December 2011, Dr. Wang gave four invited talks titled "Secure access control to untrusted storage in the clouds using unidirectional re-encryption" at George Washington University, Boston University, Tsinghua University, and Worcester Polytechnic Institute. This was joint work with his PhD student Zack Kissel.



The photo showed a signing ceremony between UMass Lowell and XJTU on Oct 24. First row (from left to right): Wang Jianhua, Party Secretary of XJTU; Marty Meehan, Chancellor of UMass Lowell. Second row (from left to right): YANG Xingyu, Associate Director of Institute of Mathematical Modeling at XJTU; LIANG Li; GUAN Xiaohong; LU Tianjian, Vice President of XJTU; Ahmed Abdalel, Provost of UMass Lowell; Jie Wang, Director of China Partnerships of UMass Lowell; Benyuan Liu, Associate Professor of Computer Science at UMass Lowell.

Prof. Holly Yanco was awarded Senior Member status in the Association for the Advancement of Artificial Intelligence (AAAI) in August 2011 at the annual AAAI conference. Prof. Yanco was one of nine people awarded this honor this year, which was the first year Senior Members have been selected. Prof. Holly Yanco is the General Chair of the 7th Annual ACM/IEEE International Conference on Human-Robot Interaction, which will be held at the Hilton Back Bay in Boston March 2012.

Prof. Holly Yanco leads a team of researchers from UMass Lowell, the University of Michigan and Tufts University has received a two-year grant from the National Science Foundation (NSF) totaling nearly \$1.5 million to create intelligent robot systems.

Prof. Xinwen Fu was awarded a grant entitled "Membership Inference in a Differentially Private World and Beyond" from NSF's Trustworthy Computing program. The award is a great boost to the Department's security program, and will strengthen its national status in related fields. The award funds a three-year research agenda among three universities—George Washington University, Towson University, and the University of Massachusetts Lowell. The overall award totals \$495K and UMass Lowell's share is \$166K.

The objective of the research project is to systematically understand, evaluate and contribute to the problem of membership inference in aggregate data publishing, which is a generic, novel, and dangerous privacy threat in a wide variety of real-world applications.

Prof. Fu is a member of the Computer Science department's Center for Network and Information Security (CNIS). His research focuses on network security and privacy, network and computer forensics, and distributed systems.



Martin and Scribner-MacLean announce \$1.3M NSF Science Education Award

Profs. Fred Martin (Computer Science) and Michelle Scribner-MacLean (Graduate School of Education) were guests at the Fifth Annual River Day, hosted by Congresswomen Niki Tsongas on September 15, 2011.

Martin and Scribner-MacLean joined Rep. Tsongas on the banks of the Concord River to describe their new four-year, \$1.3M NSF award to create an internet-based platform, dubbed iSENSE, which will engage students in data-intensive science inquiry. Working with a number of school systems in the Merrimack Valley, Martin and Scribner-MacLean will support teachers in integrating the internet-based technology into their science instruction.



(L-R) Prof. Fred Martin, U.S. Congresswoman Niki Tsongas, and Prof. Michelle Scribner-MacLean

Prof. Guanling Chen offered a project course on developing Android application, to prepare our UML students on programming skills for the fast-moving mobile industry in the fall 2011. The students formed 4 teams, each working on a different group project. To manage the project develop-

ment, the class adopted a min-version of agile programming method that had three project iterations, each lasting 3-4 weeks. The idea was to make a workable application first and then grow it more feature-rich incrementally. Through this strict software engineering process and the peer support of the groups, the students successfully completed four exciting and beautiful Android apps that teach kids math and other essential skills through games, allow parents to lock certain apps on the device, and encourage physical activities by monitoring walks and integrating incentives.

Prof. Guanling Chen gave a guest lecture for the Digital Arts class taught by Prof. Lorie Loeb at Dartmouth College, on the topic of Usability Testing of Mobile Application.

Prof. Jesse Heines is the leader of a multi-departmental UMass Lowell team that has been awarded \$450K from the National Science Foundation for their project, Computational Thinking through Computing and Music. Profs. Gena Greher and Alex Ruthmann (both of UMass Lowell's Music Department) are co-PIs on the award.

The new award focuses on ways to engage both computing, music, and students of other disciplines in "computational thinking," an emerging idea in computer science education.

The team will also lead workshops to share their approaches with undergraduate faculty across the United States.

Prof. Benyuan Liu, together with a team of researchers from Scientific Systems Co. Inc. and Harvard Medical School's Department of Population Medicine, received a \$200,000 award from the National Institutes of Health (NIH) to study the use of online social networks such as Twitter and Facebook to help improve the prediction of influenza levels within a population and keep track of its spread. Their results show that these posts on Twitter closely match the number of flu-like cases reported by the CDC, and the online social network's ability to track the flu in real time provides an opportunity to significantly enhance public health preparedness against influenza epidemics and other pandemics.

Professor Georges Grinstein's IVPR team has released Weave 1.0, a web-based analysis and visualization platform. Weave was developed in collaboration with faculty and students from the Economic and Social Development of Regions program at UML, and with financial support and guidance from the national Open Indicators Consortium (OIC). During the fall semester, as part of the Weave development effort, undergraduate CS student Krithika Manohar, developed a method to transform data so that changes over time can be displayed in Weave. The feature Krithika developed has been important in major efforts in public health agencies in Seattle and the Chicago metropolitan area.



Student Achievement

Computer Science Ph.D. students Zhongli Liu and Yinjie Chen won the silver medal at the ACM Student Research Competition (SRC) at ACM MobiCom 2011 with their work titled HAWK: An Unmanned Mini Helicopter-based Aerial Wireless Kit for Search, Rescue and Surveillance. Zhongli also won the ACM's SRC Travel Award of \$500. MobiCom is a top academic conference on wireless networks.

HAWK is a small programmable unmanned helicopter (Dragonflyer X6) equipped with a wireless sniffer (a Nokia n900 smartphone). It is the first mini autonomous Unmanned Aerial Vehicle (UAV) as an aerial wireless kit for search, rescue and surveillance, based on a mini helicopter, instead of a mini airplane. As a "warflying" tool, HAWK is more flexible than warwalking and wardriving tools in many situations.

Two UML Computer Science majors have each won awards for their projects completed during a 54-hour Boston Startup Weekend "hackathon" held at Boston University. The event was held from Friday evening, October 14, through Sunday night, October 16, 2011.

Undergraduate Paul Senatillaka led the development of "Tabber," an electric guitar that was augmented with LEDs in the fretboard, which would light up to teach you how to play songs. Senatillaka was the lead hardware and firmware developer.

Tabber won first place for Best Technology and second place as an Overall Winner in the event.

Graduate student Amit Choudhary won a second place in User Design for his project, SponsorBar, which allows web site and event sponsors to easily create more engaging, active logos that would appear in the sponsorship logo strip at the top or bottom of a web site.

Curran Kelleher, a CS doctoral candidate advised by Prof. Georges Grinstein, presented a paper at the Workshop on Visual Analytics in Healthcare at IEEE VisWeek 2011. The paper, "Assessing Risks for Families with Inherited Cancers", focused on a clinical workflow support system for patients in the breast cancer clinic at MGH.

Jie (Jane) Yang, a doctoral candidate advised by Prof. Jie Wang, presented her paper, "An Intersection Collision Warning System using Wi-Fi Smartphones in VANET", at the 54th IEEE Global Communications Conference (GLOBECOM) from 5-9 December 2011 in Houston, Texas. Their paper discusses an intersection collision warning system using Wi-Fi smartphones with built-in GPS receivers for vehicular ad-hoc networks.

Xiaoxiao Ma, a doctoral candidate advised by Prof. Guanling Chen, presented his paper, "A Toolkit for Usability Testing of Mobile Applications" at the 3rd International Conference on Mobile Computing, Applications, and Services (MobiCase), Los Angeles, CA, October 2011. In this paper, they build a toolkit that embeds into mobile applications to collect user interface events and construct a model to conduct analysis with these fine-grained events.

You Li, a doctoral candidate advised by Prof. Jie Wang, presented their paper, "A Spatio-Temporal Approach to the Discovery of Online Social Trends", at the 5th Annual International Conference on Combinatorial Optimization and Applications (COCOA'11) from August 4-6, 2011, in Zhangjiajie, China. The paper was co-authored by Harshavardhan Achrekar, Zheng Fang, Jie Wang, Benyuan Liu and Cindy Chen. Their paper design and implement the whole online social network discovery system.

Graduating Students

Derfen Lin, a doctoral candidate advised by Prof. Jie Wang, has defended her dissertation in Nov. The title of her dissertation is "A Robust Error Diffusion System for Generating Mosaic Imagery."

Derrell Lipman advised by Prof. Fred Martin defended his Master's thesis, entitled "*LIBERATED*: A fully in-browser client and server web application debug and test environment." in Nov. 2011.

Michael K. Penta advised by Prof. Fred Martin defended his Master's thesis, entitled "Video Game Creation as a Platform for Mathematical Learning." on Nov 17, 2011.



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A Newsletter From the
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