



FALL SEMESTER
2013

What's Up in
@ NJIT?

Computer Science

Message from the Chair of CS, Dr. James Geller

The Fall Semester of 2013 began with much excitement. First a new Dean started at the College of Computing Sciences, the administrative home of the Computer Science Department. We welcome Dr. Marek Rusinkiewicz into the College and wish him the best of luck and success in his new position.

On September 3rd, New Jersey Governor Christopher Christie came to visit NJIT. In front of the Central King Building he gave a press conference talking about his vision for the future and how education plays a role in it. NJIT received \$86 Million from the recent NJ bond issue for renovation of the Central King Building with new classes and labs. This is the largest single project of all educational activities to be funded through the bond issue. A second project brings the total take-up of NJIT to almost \$100 Million.

On Sept. 18, NJIT opened the Warren Street Village in a festive ceremony, a complex containing a large new home for the Honor College, a convenience store, a café, and a Greek Village of five houses, each for two fraternities. Let us hope for more exciting developments for Computer Science, the College, and NJIT. Let me close with wishing all members of our community a successful and enjoyable school year.



NJIT Ranked #1 College in the Country

October 22, 2013
Joel S. Bloom

BuzzFeed.com recently released an article which rated which colleges provided the best investment in tuition for graduates. The ranking calculates college and university value by comparing annual tuition cost and the average starting salary of graduates. We have achieved this outcome based on a concerted effort to control the cost of education, our students' drive to succeed, and the quality of their preparation by our faculty. The majority of our graduates are from New Jersey and many stay here as significant contributors to our state's economy and quality of life.

This rating is based upon quantifiable data, not perception or opinions, so it is particularly important to us. NJIT earned the top spot among all U.S. colleges and universities,

because the average starting salaries of its graduates nearly doubles the annual tuition fee charged to out-of-state students. Using NJIT's tuition rate for New Jersey residents immensely increases the university's value proposition, making alumni average starting salaries nearly four times greater than NJIT's annual tuition cost. The numbers clearly demonstrate that NJIT is preparing its graduates for great professional success and that the university is doing so at a reasonable cost.

While there is a great deal of concern publicly about the cost of higher education, it is very inspiring to keep in mind that NJIT offers a significant value proposition to our students, their families, and to the people of NJIT. [1]

PhD Dissertation Defense: On-road Localization & Data Dissemination in Vehicular Ad Hoc Networks . Tan Yan

On 11/26/2013 Tan Yan presented his dissertation work. Vehicle localization and data dissemination in Vehicular Ad Hoc Networks (VANET) are two important problems in VANET and are challenging due to its dynamic nature. The thesis research focuses on providing mechanisms for vehicle localization and efficient data dissemination to drivers. Dr. Tan Yan wrote:

In the dissertation defense, I will present my work in access point planning for data dissemination to all the drivers in the area. I study a fundamental problem: roadside infrastructure planning, and propose a class of algorithms to select a minimum number of intersections to install the infrastructures. I formulate the underlying problem to be an intersection selection problem, formally prove its NP-Completeness, and provide a novel heuristic, Adapted Bipartite-based Heuristic (ABS), to solve it, whose worst-case approximation ratio is $4/3$. ABS bridges the planar graph and the bipartite graph through topology transformation. With ABS, the approximate solution to all the problems that are NP-hard in general planar graph but polynomial solvable in bipartite graph can be efficiently obtained in planar graph. ABS is applied on various real city maps, and the number of intersections selected by ABS is close to that by the exact solution and is much smaller than that by Random and Greedy heuristics. (Advisor: Dr. Grace Wang)



Congrats to our CS Professors: Dr. Reza Curtmola and Dr. Zhi Wei

We would like to congratulate Professors Reza Curtmola (above; center) and Zhi Wei (right; center) pictured with (from left to right) Dr. James Geller, CS Department Chair, Dr. Fadi Deek, Provost, Dr. Steve DePalma, NJIT Board of Trustee President and alumnus and Dr. Joel Bloom, NJIT President, for being granted tenure this past September.



Chris Christie visits NJIT

September 3, 2013

New Jersey Governor Christopher J. Christie visited NJIT campus on September 3rd 2013, to spotlight the ongoing renovation of NJIT's Central King Building (formerly Newark's Central High) into a state-of-the-art technology center. Funding for the effort - \$86 million - resulted from passage last November of New Jersey's largest- ever bond issue to benefit higher education. Christie then highlighted his commitment to higher education spending as the best way to stop the brain drain



Above: Governor Christie with NJIT PhD Student Zhe He

and keep NJ's high school students home. He touted the newest NJIT facility, the largest single project supported by funds from the Building Our Future Bond Act. The Central King Building will be transformed into a state-of-the-art STEM teaching and learning hub to provide technological resources bolstering NJIT's research, instructional, and academic support programs. Once completed in 2016, the renovated 220,000 square-foot building will become a campus and community landmark that houses a Center for Innovation and Discovery. [2]

Warren Street Village Ribbon Cutting

\$80M Housing Complex for Greek Organizations and Honors students opened, allowing residence for over 600 students.



Above: Dr. Steve DePalma, NJIT Board of Trustee President and alumnus and Dr. Joel Bloom, NJIT President

The doors opened this past September to NJIT's new \$80 million Warren Street Village, a unique, three-acre, 214,000-square-foot mixed-use residential housing complex. Completed as forecast in less than 18 months, the complex, will add 600 beds to NJIT's existing inventory of residential housing. The new complex accommodates pent-up student demand which until now has filled NJIT's housing to capacity using triples in

doubles rooms and leasing off-campus space. Village residents are a combination of Albert Dormans Honors College students in the main building coupled with four new duplex homes for members of fraternities and sororities. The ribbon cutting for the new community was held on September 18, 2013 with a welcome and introduction provided by Charles R. Dees, Jr., vice president for university advancement.

President Joel S. Bloom, master of the event's ceremonies and the founder and former dean of NJIT's 12-year-old Dormans Honors College, has been a fervent Village advocate. The new Honors dorms will include computer labs, project studios, a library, student lounges, government offices and more. The Greek homes will provide living, dining, and chapter space with sleeping quarters on the upper two floors. [3]

PhD Dissertation Defense: Using Structural and Semantic Methodologies to Enhance Biomedical Terminologies . Zhe He

On November 27th, 2013, Zhe He presented his PhD Dissertation Defense: Using Structural and Semantic Methodologies to enhance Biomedical Terminologies. In this dissertation, structural and semantic methodologies are used to enhance biomedical terminologies. The dissertation work is divided into three major parts. The first part consists of structural auditing techniques for the Semantic Network of the Unified Medical Language System (UMLS), which serves as a vocabulary knowledge base for biomedical research in various applications. The second part is to enhance the conceptual content of SNOMED CT by methods of semantic harmonization. The third part applies Quality Assurance techniques based on Abstraction Networks to biomedical ontologies in BioPortal. The National Center for Biomedical Ontology provides BioPortal as a repository of over 350 biomedical ontologies covering a wide range of domains. It is difficult to design a new Quality Assurance methodology for each ontology in BioPortal. Fortunately, groups of ontologies in BioPortal share common structural features and can be grouped into families based on combinations of these features. Family members can then be processed in the same way to find errors in BioPortal terminologies. (Advisors: Dr. James Geller and Dr. Yehoshua Perl)

IBM Guest Speaker . Dr. BalaPrasanna

On October 9th, the Computer Science department welcomed Dr. Bala Prasanna, who presented a seminar on Working in the 21st Century . Essential Skills to Survive & Thrive in Present Day Workplace.+

While no one can give job security, one can strive for career security through career growth. An important component of career growth is by learning and practicing soft skills. In this context, note that workplace habits and expectations have changed significantly in the last few years. Surviving and thriving depends on your ability to grasp the broader picture and hone some essential skills. The presentation offered tips to be relevant and successful in today's workplace.

Other CS Department Guest Speakers

The Computer Science Department holds regular seminars on a number of current research topics. Some seminars offered in 2013 were:

- Engineering Practical End-To-End Verifiable Voting Systems . Dr. Richard Carback (Nov 20, 2013)
- Student Panel: Intern Experience in Summer 2013 . Various CS Students (Oct 16, 2013)
- Inferring Casual Relationships from large-Scale Time-Series . Dr. Samantha Kleinberg (April 10, 2013)
- Mining Big Data Using Kernel . Dr. Kai Zhang (April 3, 2013)

For a complete list of past seminars, please visit NJIT's Computer Science Department Seminars page at:

http://web.njit.edu/cs/CS_Seminar/index.php?a=1

PhD Dissertation Defense: Innovative Local Texture Descriptors with Application to Eye Detection. Jiayu Gu

On 11/4/2013, Jiayu Gu defended his PhD on Local Binary Patterns (LBP), which is one of the well-known texture descriptors and has broad applications in computer vision. The attractive properties of LBP are its tolerance against illumination variations and its simplicity. However, LBP only compares a pixel with those in its own neighborhood and encodes little information about the relationship of the local texture with the features. This dissertation presents a new Feature Local Binary Patterns (FLBP) texture descriptor that can compare a pixel with those in its own neighborhood as well as in other neighborhoods and encodes the information of both local texture and features. (Advisor: Dr. Chengjun Liu)

Dr. Ankur Agrawal Receives Distinguished Paper Award

A research paper from the SABOC research group in the Computer Science Department of NJIT was one of the five recipients of the distinguished paper award at the prestigious 37th Annual Symposium of the American Medical Informatics Association (AMIA) held in Washington D.C. November 16-20, 2013. The AMIA symposium is the leading scientific meeting for biomedical and health informatics research and practice not only in the US but worldwide.

The paper is titled "Identifying Inconsistencies in SNOMED CT Problem Lists using Structural Indicators" and was authored by Ankur Agrawal, Yehoshua Perl, Yan Chen, Gai Elhanan and Mei Liu. Dr. Perl and Dr. Liu are professors in the Computer Science Department and were the PhD co-advisors of Dr. Agrawal. Dr. Yan Chen is an alumna of CS NJIT. Dr. Gai Elhanan is a long-term collaborator of the SABOC research group. (SABOC is the Structural Analysis of Biomedical Ontologies Center in the Department of Computer Science, with Dr. Perl and Dr. Geller as the co-directors.)

Dr. Agrawal's paper presents techniques to use various structural indicators to identify erroneous concepts in medical online dictionaries (known as medical terminologies) with high probability, thus providing better utilization of limited terminology auditing resources.

Dr. Agrawal is now an assistant professor at the Manhattan College in New York City. [4]

Professor Curtmola receives Outstanding Paper Award

Dr. Reza Curtmola and his student Bo Chen received an outstanding paper award for their publication "Replication-Based Storage Systems Using Untrusted Clouds," published in the Proceedings of the 3rd ACM Conference on Data and Application Security and Privacy (CODASPY 2013) in February 2013.



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