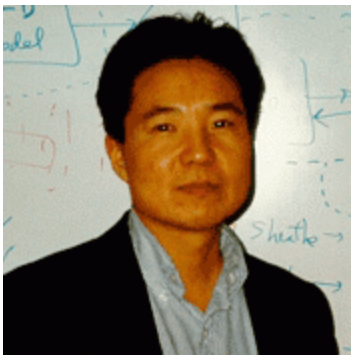
THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON DC

Department of Computer Science

Newsletter: Spring 2006


Prof. James Hahn, Department Chair

Welcome to the first issue of our newsletter! We hope to offer this newsletter every semester, so you may catch up with what has been happening in the department.

The academic year started well, when the American Society for Engineering Education ranked GW first, nationally, in percentage of female doctoral students in engineering in the year 2003. Late in Fall 2005, we heard that Prof. Dianne Martin received GW's *Bender Teaching Award*. As the Spring semester draws to a close, we have heard that Prof. Florea has received the highly selective *Sloan Research Fellowship*. There has also been good news about students and alumni. Bill Westenhofer, (MS, 1995) was nominated for an *Academy Award* (Oscar), Achal Achrol (BS, 2003) received the *Soros Fellowship*, Nathan Green, (current MS student) received a *Fulbright Scholarship*, and Ben Hosp (current DSc student) was a repeat winner of the *ARCS Scholarship*. Congratulations to all of them!

But as this year comes to a close, it is time to say goodbye. Most of you know Prof. Michael Feldman, one of our best-loved faculty members. Prof. Feldman has been with GW for thirty-one years, and is a winner of GW's highest teaching award, the *Oscar and Shoshana Trachtenberg Teaching Award*. We are sorry that this is his last semester at GW – he is retiring this year, when he and his wife plan to move to Portland and the beautiful Pacific Northwest. Needless to say, we wish him the very best, and hope to see him often. This newsletter features an interview with Prof. Feldman, and also provides information on new faculty members, Prof. Liliana Florea and Prof. Rhys Price Jones.

We have also seen two staff members leave us in the last few months. Tameka Jackson was with us for about a year, and is now IT Coordinator at the Maya Angelou Public Charter School. Danielle Swails was with us for almost six years, and is now Advanced Degree Program Coordinator in the Columbian School of Arts and Sciences. We wish them the very best! Tameka and Danielle have been replaced by two very able new staff members: Quoc ("Q") Truong and Luis Acevedo. Barbara Edwards and Yvonne Hood were stalwarts during the transition, picking up considerable slack. What would we do without our staff, including system administrators Liran Ma and Aleksander Stefanovski?

We now have a student lounge, located on the left at the department entrance. Come by and see it one of these days, if you haven't already, and thank Yvonne Hood for her hard work on it. Yvonne has also been organizing the recently-started fortnightly Graduate Student Pizza Night.

Due largely to the efforts of Prof. Xiuzhen Cheng and students Tejdipto Bose and Hongjun (Henry) Yu, the departmental website has gone through an enormous update. You will see latest news and event information on the main website now, in addition to the usual information of interest to prospective and current students. Use this site to keep in touch with your favorite university and department. In fact, there is an anonymous suggestion box on the website that you may use, to make suggestions or to tell us your thoughts. The box is at:

http://www.cs.gwu.edu/contact/suggestions/

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CS@GW

Undergraduate Student Spends Spring Break Volunteering in New Orleans

Four of us, Christina Wadhwani (Public Health), Lisa Tran (Mechanical Engineering), Janaki Umarvadia (Political Science) and I (Computer Science) spent our Spring Break in New Orleans, helping the victims of Hurricane Katrina rebuild and resettle their homes. We had long wanted to participate in the Katrina Relief Effort, but were not able to connect with it until the National Congress of Vietnamese Americans – a partner of the Vietnamese Student Association – offered us funding and a point of contact.

Left to right: GW students Janaki Umarvadia, Phu Nguyen, Christina Wadhwani, Lisa Tran (in white uniform) and home owners Mike and Janet

We drove down to New Orleans with the mission of helping Katrina victims regardless of race and background. While there, we stayed at Mary Queen of Vietnam Church, and spent our time gutting homes, sanding down walls of a rebuilt American Church, and sorting and folding donated clothes.

It is very sad to see the damage in infrastructure, the separation of family members, and to hear the stories of lost lives. However, it is very inspiring to know that these victims are not devastated or mourning for their loss; in fact, they are very strong and positive towards their future of a newly rebuilt New Orleans.

Phu Nguyen

New Faculty

Liliana Florea

Prof. Florea has been at George Washington since Spring 2005. Before GW, she worked for Celera Genomics/Applera Co., where she contributed to the sequencing of the human genome[1]. Her current areas of interest include the development of algorithms and tools for cDNA and genomic sequence alignment, comparative genomics, gene annotation, alternative splicing and its regulation, miRNA genomics, and peptide-based vaccine design.

[1] Venter J.C., M.D. Adams, G. Myers, P.W. Li, R. Mural, G.G. Sutton et al. (2001) --- "The sequence of the human genome", Science 291(5507), 1304-1351.

Rhys Price Jones

Prof. Price Jones has been with George Washington since Summer 2005. He has spent a significant portion of his career as a tenured faculty member at Oberlin College and at the Rochester Institute of Technology (RIT), and has also spent time on the faculty at the joint campus of Indiana University and Purdue University at Fort Wayne. While he has been active in research in game theory and graph theory, implementation (particularly parallel) of declarative and logic programming languages, and automated analysis

and formatting of document styles, his current research efforts have been mainly in vaccine discovery and in genetic algorithm experiments for bacterial start site prediction.

Prof. Price Jones has been particularly active in student issues. While at Oberlin, he presided over a faculty-student committee that revised the constitution of the Honor Code, and at GW he has been mentoring the ACM student chapter.

Prof. Price Jones also has an interest in collaborative efforts; while at Oberlin, he instigated collaborative efforts between Oberlin and Spelman College (a historically black women's college in Atlanta). He has also been interested in collaborations with the arts and music, having taught an Artist/ Technician collaboration course with the Film and Animation Department at RIT, and having designed a course combining computer science and music composition. He has also taught courses on Visual Thinking and in Scientific Visualization

News Snippets

Prof. Dianne Martin receives GW's Bender Teaching Award

In October 2005, GW honored six professors with the Bender Teaching Award for their work towards the development of faculty activities in addition to their role as outstanding educators. Among the awardees was CS faculty member Prof. Dianne Martin. The award is prestigious because it is based on input from both students and faculty, and the selection process relies on nominations, recommendation letters, student teaching evaluations and course syllabi.

$2.8 Million Grant To Improve Success Rate of Surgery for Voice Disorders

The School of Medicine and Health Science, the Department of Computer Science and the Department of Mechanical and Aerospace Engineering, obtained a joint NIH grant of $2.8 million for a proposal to use computer tools to improve the success rate of a surgical procedure for voice disorders. The project will use computer simulation of air flow in the larynx to aid surgical planning. It is hoped that the tool will contribute to a reduction in the rate of surgical failure, which is currently at about 24%.

Prof. Liliana Florea receives Sloan Fellowship

Assistant Professor Liliana Florea was awarded a *Sloan Research Fellowship* for the year 2006. The purpose of the Sloan Fellowship is to "stimulate fundamental research by early-career scientists and scholars of outstanding promise". It is highly selective - only 116 winners are chosen annually, in the fields of chemistry, computational and evolutionary molecular biology, computer science, economics, mathematics, neuroscience, and physics; 32 Sloan winners have gone on to become Nobel Laureates.

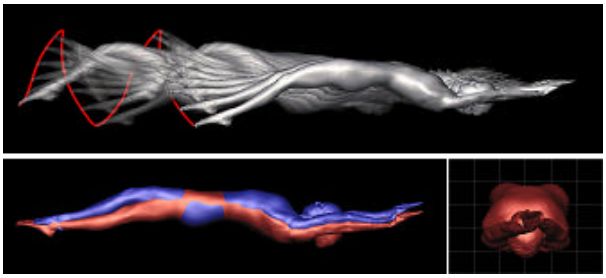
Prof. Florea's Sloan Fellowship will support several activities related to her research, including: the development of tools and methods to analyze the human hepatitis C virus and bacterial genomes such as E. coli; efforts to design new, large-scale computational tools to compare genomes and

genes across different species; and studies of gene variations in different tissues or at different stages of development or disease.

Acknowledgements: Some of this material is from the SEAS website.

Swimming Video Analysis for US Olympic Swim Team

Research groups from the Department of Computer Science and the Department of Mechanical and Aerospeace Engineering have been working on the modeling and visualization of human swimmers for the US Olympic swim team. The CS group is led by Prof. James Hahn and includes students Jean Honorio, Tina Ma and Samir Roy, while the MAE group is led by Prof. Rajat Mittal.



The group uses body-scan and videographic data provided by USA Swimming to produce realistic, 3D animated computer models of swimmers, which can then be used for a detailed analysis of swimming technique by coaches and athletes. The figure above shows a multi-exposure view of a 3D computer model captured from video of a real swimmer executing a dolphin kick. This model can be made to move precisely like the athlete in question. The model can then be measured and visualized to give a variety of information about the swimmer; for instance, the red line in the figure traces the motion of the toe. This information can be compared for various swimmers, and used to improve swimming technique.

Student and Alumni Achievements

CS Alum Receives Academy Award Nomination

Bill Westenhofer (MS, 1995, Computer Science) was nominated for the 2005 Academy Award (Oscar) for Achievement in Visual Effects. Bill was the Visual Supervisor leading the Rhythm & Hues' team on "The Chronicles of Narnia: The Lion, the Witch and the Wardrobe". He did his MS thesis at GW in the use of dynamics in physics-based animation. The category of *achievement in visual effects* is a highly-contested one – an initial set of 15 films was whittled down to seven, which were further examined closely to determine the three finalists. Bill's other films include "Babe: Pig in the City", "Stuart Little" and "Men in Black II".

CS Alum Receives Soros Fellowship

Achal Achrol (BS, *magna cum laude*, 2003) is currently a medical student at Stanford University. He is an awardee of the *Paul and Daisy Soros Fellowship for New Americans* for the year 2006. The fellowship is very competitive, choosing the 30 winners from approximately 800 applicants. It is intended to "provide opportunities for continuing generations of able and accomplished New Americans to achieve leadership in their chosen fields ".

Acknowledgements: Most of this material was obtained from the Soros Fellowship website.

CS Graduate Student Receives Fulbright Scholarship

Nathan Green (current MS student) has received a *Fulbright Scholarship* to study applications of narrative coding at the University of Iceland during the 2006/2007 academic year.

Nathan is developing a system that takes computer code and generates a descriptive paragraph in Basic English prose. This paragraph will give programmers an additional way to view the logic of their software and algorithms. For the Fulbright-funded project, Nathan will translate the paragraph into Icelandic, and test how it may benefit non-English speaking programmers. Because Icelandic has remained remarkably uninfluenced by other languages, including English, Nathan hopes to see how his narrative can be interpreted differently in a language with little or no influence from English logic constructs.

Narrative is a natural form of instruction and explanation in Iceland, which has a long tradition of narrative story telling called Sagas. Nathan hopes that his research will show that, with a new emerging technical sector, old traditions can still be applied.

Acknowledgements: Most of this text was provided by Nathan Green.

CS Graduate Student is Repeat Winner of ARCS Scholarship

Ben Hosp (current DSc. student) is one of three SEAS students awarded the *Achievement Rewards for College Scientists (ARCS) Foundation Scholarship* for the academic year 2006-2007. The Scholarship provides $15,000 in tuition and supplies, and was instituted to encourage the study of the natural sciences, engineering and medicine among American graduate students.

Approximately 15-20 students are chosen annually from the DC Metro area.

Ben's areas of interest are electronic voting and the use of information-theoretic models in cryptography and its applications. He enjoys the combination of intellectual challenge and social relevance provided by electronic voting, and hopes to develop a means of comparing various voting systems on information-theoretic measures of the extent of privacy, integrity and verifiability they provide. After graduation, he would like to teach at a liberal arts college.

Fare Thee Well

Danielle Swails, our Graduate Program Coordinator, was with us for almost six years. She is now Advanced Degree Program Coordinator in the Columbian College of Arts and Sciences, and our loss is the Columbian College's gain! All good times must come to an end, but we are lucky to see Danielle often during her lunch break.

We Will Miss You, Prof. Feldman!

As many of you know, Spring 2006 is Prof. Feldman's last semester as an active GW faculty member. Prof. Feldman is originally from Philadelphia, and holds a bachelor's degree in electrical engineering from Princeton University, and MS and PhD degrees in computer and information sciences from the University of

Pennsylvania. He joined the GW faculty in 1975, received the Eta Kappa Nu Teacher of the Year Award in 1985, served as assistant to the vice president for academic affairs from 1986–88, and was awarded GW's highest teaching honor, the Oscar and Shoshana Trachtenberg Teaching Award, in 2003. He has been an undergraduate adviser for many years, and the Chair of the Computer Science Curriculum Committee for six years.

We took this opportunity to record some of his thoughts on his times at GW, the changes at GW and in the field of Computer Science, and, of course, on his favorite topics: teaching and students. Here is an abridged version. A more detailed version is on the Computer Science website: www.cs.gwu.edu

On the origin of the CS program at GW: I started in 1975. Prof. Arnold Meltzer was department chair, and, at the time, the Electrical Engineering and Computer Science department had about eighteen fulltime faculty. I was number 5 in Computer Science.

We had an undergraduate program that was, at that time, called an option in Electrical Engineering. Curriculum wise it was not really Computer Science, but most like what we would now call a Computer Engineering program. In the 80's that option turned into a full scale degree in Computer Science, and then it began to look more like what we know an undergraduate Computer Science degree should look like. We had a lot of students at the time and a lot of part-time faculty, because there were only five full-time faculty.

On things that have changed … and not: There have obviously been these huge technological changes. If anybody had told me when I started teaching that I would be carrying around half a gigabyte of memory in my pocket on my key chain, I would have dismissed it as Dick Tracy science fiction stuff. The curricula have also changed, of course, to keep with the technological changes. For example, Graphical User Interfaces (GUIs) hadn't been invented, so now we have to teach GUIs because they exist. But curricula have also changed to take advantage of the fact that we have computing horse power that we just didn't have before.

I think the fundamentals are still very similar. The interesting thing is that there a lot of things that *haven't* changed. We're still writing programs that are very similar to the ones we wrote before. Our languages have changed in what look syntactically to be reasonably large ways, but if you scratch the surface, you find that they are the same. I mean, there isn't that much difference between Java and C++ and Fortran.

Interdisciplinary Work in CS and at GW: I think that has changed a lot. I mean, historically, the way undergraduate – even graduate – programs evolved is that we were mostly focused on ourselves. We were building tools for ourselves – compilers, operating systems, editors – and now all those tools exist, so we can use them and look outside a bit more.

At GW it used to be much, much more difficult to do anything across schools than it is now. The

Columbian College saw itself as a strictly liberal arts institution, and engineering and business were described as professional schools. There was a limit on the number of professional courses that a student in Columbian College can take as part of their forty courses. Now, however, it's possible to have, for example, undergraduate double majors where a student would be taking a CS major and a Biology major or CS and History or Criminal Justice. That would have been completely impossible until ten years ago. That's been a big difference in the culture on both sides, and absolutely for the good.

On Winning the Trachtenberg Award: I think I'm a pretty good classroom teacher. I think there are a lot of good classroom teachers, and it's hard to know how to measure good classroom teaching. But I think what has really gotten me my reputation with the students is not so much the classroom teaching, as the advising and the mentoring – the one on one interactions.

On Advising: Luckily we are a small enough department in a small enough engineering school that we can have our advising system consist of full-time senior faculty members who are doing advising because they like it. In that respect, I think, we resemble a small college.

It benefits the students and it benefits us. I get a lot out of that interaction and really enjoy it. And I've been especially proud of mentoring students through tough times – both tough academic times and tough personal times. I love seeing all the students graduate, but I especially love seeing those students graduate who a couple of years ago didn't think they would make it, and we get them over the hump.

It's good to have a small number in the advising team. This is so that these people can be specialized in it, really know the curriculum cold, do it because they want to do it, and to really establish that one on one relationship. By having a small number you get a kind of economy of scale, that you wouldn't have if all the undergraduate population was spread out over twenty people.

On His Doctoral Students: I've had, over the years, twelve students complete the doctoral program. Which I guess is smaller than the truly research active people in the university system, but it's not bad. About the last half of them were actually working on computer science education research for the most part. And we were doing things like empirical studies to try to test out ideas about teaching techniques. So I found a way of bringing my teaching interest together with my research interest and that's worked out very well. It's a sub-discipline that in many universities doesn't get any respect. Luckily it does here, and I think that has had an effect.

A number of my former students have ended up teaching in the area, as it happens. A number of them were non-traditional students, with industry experience, who came back for their Ph.D.s. So they had roots in the area, and families, and didn't want to pull up stakes and go teach some place else. That limited their possibilities for teaching, but they have gone into teaching. And others have continued to teach as adjuncts. My most recent student went back to teach at Norfolk State which was his undergraduate institution.

I've had twelve of the greatest doctoral students I could imagine. We're generally in sync with each other, and the arguments we had were exactly the kind of arguments that doctoral advisers ought to have with doctoral students. Obviously there's tugging and pulling, but we're enough in sync to have an argument, and there's enough argument so it doesn't get boring! I think I've learned at least as much from them as they have from me.

On Committee Decisions: I think the best committees are those that really do their homework, so that when action items go to the full faculty, they're not half-baked, and the discussion with the full faculty is easy. I also think a lot of issues should be resolved in the hallway. If people are having problems with things, you just suspend the formal discussions and let things go on informally. Typically, when they come back to the committee, what you finally vote on isn't a seriously split vote.

On the GW-CS Culture: We've had a remarkable way of reaching consensus here. And not just in the curriculum committee that I had the good fortune to chair for six years. Faculty don't all just march to the same drummer and always agree on everything. But we've found ways of resolving the disagreements, I think, so that people were generally satisfied with the outcome. At least that's what I perceive.

And there hasn't been that much infusion of personality into the discussions, we've kept ourselves free of that. And interestingly enough, in the tenure and promotion discussions, right along, even from the first committee I participated on, faculty members were evaluated on their work, and personalities did not play a significant part in those discussions. The most important metric was how much respect and approbation they were getting from people in their own research community. If they were getting published, if they were getting good reference letters from people in their own field, that was enough.

I think that's a large part of what made all these years so much fun, because I would hear horror stories of politics in other departments, and we just didn't have that kind of politics here. Hopefully that will continue indefinitely. And I think the signs are very positive. So far the CS department in its seven year life is really a great place. We've developed our own culture, we've tried to figure out who we are, and it's been great.

On His Time at GW: I think GW was, for me, at the time I came into academia, just the right place. It had the right balance of emphasis on teaching and research. Obviously my predilection, my stronger drive, is for teaching. But I've done respectable research over the years, produced some respectable doctoral students, had my share of grants, and done all of that. I think there was a willingness at GW to respect the balanced person who is interested in teaching as well as research, and even a little more interested in teaching. I didn't feel like I was ever disrespected for that. And that was a good thing. So, for me, this was a great place to build a career. You know, things just kind of clicked. The chemistry was right and it just worked out.

And I believe that people should quit while they're ahead. And this is the right time for me to move on because I'm not completely tired of the place, and I don't think the place is completely tired of me, so quit while you're ahead is a good motto.

On What's Next: We bought a condo in Portland in the center of the city, in an area that's reasonably comparable to the Foggy Bottom area and West End – active and urban, just the kind of neighborhood where I can park the car in the garage and leave it there. Thirty-one years of commuting is enough, and, frankly, thirty-one years of the suburbs is enough. I was a city kid and I want to be an empty nester who's moved back to the city. We're moving in June. I will certainly visit GW often, and I expect that people who are out in the Pacific Northwest will drop in and visit me. I plan to keep my GW email address as long as the university will let me, so that's an easy way to contact me.