



# ALUMNI NEWSLETTER

## MATHEMATICS AND COMPUTER SCIENCE UNIVERSITY OF MISSOURI-ST. LOUIS

APRIL, 2007

<http://www.cs.umsl.edu>

### LETTER FROM THE CHAIR

Dear Alumni and Friends,

Please enjoy reading the Alumni Newsletter. As you may have noticed, in the last few years, the newsletter has expanded into a new format. John Antognoli, Galina Piatnitskaia, Emily Ross and Nazire Koc have been making all the changes and have been increasing our efforts to stay in touch with alumni. The department had a relatively quiet year. Qingtang Jiang was promoted to Full Professor. Professor Jiang is an expert on wavelets and their applications, with more than 30 publications by now. Assistant Professor Adrian Clinger has newly joined our department as a geometer and string theorist. He got his PhD from Columbia University and comes here after visiting the Institute for Advanced Study and Stanford University for a few years. Martin Pelikan has published an edited volume on scalable optimization. Shahla Peterman received the Lecturer of the Year Award from the College of Arts and Sciences. Our PhD program is small but thriving and it is a pleasure to be able to congratulate Eric Mason and David Stamps, the latest two graduates.



A. Prabhakar Rao

Cordially,  
A. Prabhakar Rao

### RICHARD STALLMAN TO DELIVER THE 2007 SPENCER LECTURE

**"THE FREE SOFTWARE MOVEMENT AND  
THE GNU/LINUX OPERATING SYSTEM"  
MONDAY, APRIL 23, 2007 7:00 P.M.  
CENTURY ROOM,  
MILLENNIUM STUDENT CENTER**

This lecture is made possible by the generous gift of Robert Spencer (B.A. Mathematics, '72).

Richard Stallman is a well-known software freedom activist and software developer. In 1983 he began the GNU Project to create a free Unix style operating system. He has since, been the project's main architect and leader. As a result of this he began the free software



Richard Stallman

movement and in 1985 founded the Free Software Foundation. He also co-founded the League for Programming Freedom. The GNU operating system when combined with the Linux kernel makes a complete operating system, which most people simply refer to as Linux (without recognising GNU).

He has received considerable recognition for his work including a MacArthur Fellowship in 1990. He received the Association of Computing Machinery's Grace Hopper Award "For pioneering work in the development of the extensible editor EMACS (Editing Macros)" in 1991, the Electronic Frontier Foundation's Pioneer Award (1998), the Yuri Rubinsky Memorial Award (1999) and the Takeda Techno-Entrepreneurship Award for Social/Economic Well-Being (2001). He has received honorary doctorates from Sweden's Royal Institute of Technology, University of Glasgow, Vrije Universiteit Brussel, Universidad Nacional de Salta, an honorary Professorship from Universidad Nacional de Ingenieria del Peru and membership in the United States National Academy of Engineering.

Dr. Stallman will speak on "The Free Software Movement and the GNU/Linux Operating System" on Monday, April 23 at 7:00 pm in the Century Room of the Millennium Student Center at UM-St. Louis.

### SCHOLARSHIP NEWS FROM RON DOTZEL, CHAIR OF THE ANDALAFTE, SPENCER, AND SCHOLARSHIP COMMITTEES

**Mathematical Sciences Alumni Scholarships** are given each Spring semester to undergraduate students in Mathematics or Computer Science who have an outstanding academic record at UM-St. Louis. These awards are made possible by the generosity of alumni of UM-St. Louis, most of whom are graduates of the Department of Mathematics and Computer Science. The 2006 winners are:

Cathleen Aubuchon	Elizabeth Radetic
Larry Burkett	Clariencia Stroud
John Hoven	Eric Tyhurst
Eric Lee	

The **Joseph and Mary Vogl Scholarship** is given each year to a mathematics undergraduate who has achieved distinction. This year's winner is **Harry Pope**.



The **Raymond and Thelma Balbes Scholarship** is given each year to an undergraduate mathematics major who has attained an outstanding academic record. This year's winner is **Colleen Leahy**.

The **Edward Z. Andalafte Memorial Scholarship** is given each year to a mathematics undergraduate who has a record of outstanding academic performance. This year's winner is **Aleksey Kazakevich**.

The **Andalafte Mathematical Competition** is a 3 hour exam consisting of five very challenging problems. We anticipate offering this competition each year. The competition is open to all UM-St. Louis undergraduates. The winner for 2006 is **David Peaslee**.

Well-deserved congratulations to all.

### REPORT ON THE 2006 SPENCER LECTURE WRITTEN BY SCOTT LAVELOCK

(It was his assignment in English 3140, News Writing)

Robert Hogg, professor emeritus of statistics at the University of Iowa, engaged an audience at the University of Missouri-St. Louis on the role of statistics in everyday life on Monday, April 24.

His speech, entitled "Probability and Life", not only showed the crowd of about 110 students and faculty how they can learn from statistics to make decisions in their lives, but also kept everyone laughing throughout the evening with his sense of humor.

"If you don't know what you're talkin about," joked Hogg, 81, "throw in a decimal point somewhere!"

Hogg (pronounced HOAG) talked of figures, probabilities, and statistics with all sorts of decimal points in his speech given in the Century Room on the 3rd floor of the Millennium Student Center at UMSL. Many of these facts were regarding the probability of winning games of chance, and what people should know before they make any bet.

"By the way, I'm not encouraging to gamble..." Hogg said with a laugh as he provided his audience with numbers that would be helpful to anyone placing a bet on anything from the flip of a coin to the roulette wheel. In fact, his demonstration of statistical formulas, all done on a simple overhead transparency that he jokingly called his Power Point slides, showed how the numbers are stacked against someone rolling the proverbial dice.

The former president of the American Statistical Association showed how someone who enters a casino with \$80 and makes up their mind to finish with either \$100 or \$0 will end up with \$0 a whopping 91% of the time. He also exemplified how remote the possibility of winning the Power ball jackpot is, saying that a person would have roughly the same chance of correctly picking a point on a string being stretched from New York to Los Angeles within one inch of the exact point.

"Therefore, I've never bought a Power ball ticket!" exclaimed Hogg in his transference of wisdom. "But it is still only a dollar!"

The author of four statistics textbooks that are now standard in colleges across the nation had plenty of advice for the crowd mostly of math and computer science students and faculty. His statistical findings have shown that one should not put insurance on anything worth less than two months salary, and that giving money back to charity and education makes the chances very good that your money will go to good use.

"They told me to tell you this, but remember the UMSL Department of Math and Computer Science when you're 81 years old." said Hogg, whose lecture was sponsored by the aforementioned department. UMSL alumnus Robert Spencer, a math student of the class of 1972, underwrote the presentation as the 9th Annual Spencer & Spencer Systems Math and Computer Science Lecture.

Hogg, who has been giving lectures at colleges around the country for over 50 years, had plenty of stories to tell that kept the audience on its toes. He told of one story about an encounter he and his friends had with a few intoxicated men several years ago, where he playfully came to the random conclusion that the probability of one of the drunken men sleeping with another man's wife was about 63%.

"Of course, after I got married I found out that the probability of a married man sleeping with anyone's wife was 0%!"

UMSL Chancellor Thomas George opened the program promptly at 7:30 p.m. by welcoming everyone on a lovely spring evening and apologizing for them having to miss the game between the Cardinals and the Pirates. Hogg grew up in Hannibal, MO and is a lifelong Cardinals fan, however, and kept the Redbird Faithful happy with his stories of watching the team play as early as the 1930s.

Following his speech, Hogg was presented with a framed picture of St. Louis by Chancellor George, to which he responded jokingly, "Oh...I was expecting cash..." Following the chorus of laughter, Hogg assured the audience, "You're a great class; you all get A's! I think you've had enough Hogg-wash!"

### SHAHLA PETERMAN, LECTURER OF THE YEAR

We honor **Shahla Peterman** who received an award of the **Lecturer of the Year** from the College of Arts and Sciences in 2006. Mrs. Peterman has always been a wonderful teacher and a very creative person. The last couple of years also demonstrated her great leadership potential. As you may know from our last year's Newsletter, she was in charge of introducing a new technology into teaching College Algebra. Now UMSL has a new facility (MTLC) where students have an opportunity to study mathematics using modern technology.

Students and faculty members of our department have always known that Mrs. Peterman is one of the best teachers. Her award is recognition of her talent at the college level.

Dear Shahla, we congratulate you once again and wish you many more happy and productive years at UMSL!



## NEW SUITS FOR BILL CONNETT

In the Spring of 1968, a fresh young graduate from the University of Chicago applied for a job at the new campus of the University of Missouri System. The chairman at the time, Ed Andalafte, the new and only professor in the Department, Deborah Haimo, and the Chancellor, Glen Driscoll, all assured the callow candidate that although we were young and awkward, and still unformed we were going to become a great research university. Part of the joy of coming to The University of Missouri- St. Louis (UMSL) would be to help shape the directions and new programs the new school would offer. In particular, they wanted to hire a faculty that would allow this school to become a strong research institution, and in particular we would soon offer the Ph.D. in Mathematics.

The candidate was impressed by the energy of the new enterprise, and decided to come to UMSL to build this new institution. The candidate had no idea how complicated this endeavor would be, nor how long it would take. It was an especially sweet moment on November 10, in 2005, for the graying professor that the callow candidate had become to be part of the examination committee that awarded Karen Wurdack the first Ph.D. degree granted by the Department of Mathematics at UMSL. (Thirty seven years later!) Karen did a great job, and our program is now bubbling along. We now have four graduates, and some twelve other candidates in the pipeline. Neither Andalafte, nor Haimo, nor Driscoll were here to see it happen, but I was.

This singular moment for the Department, and for this graying professor in particular, led to some speculation on my part about the nature of the mathematical enterprise, and the way we carry mathematical knowledge from our mathematical parents to our mathematical children. I was inspired to look up my mathematical genealogy, something I had never done before. You might enjoy looking at this on my web page ([www.cs.umsl.edu/~connett/](http://www.cs.umsl.edu/~connett/), and click on the link to my vita). I was so impressed to see that I am the (great)<sup>4</sup>-grandson of Pafnuty Chebyshev that I decided to give two colloquia this Fall on one of my favorite mathematical objects, the Chebyshev polynomials. In the course of this I looked through many of Chebyshev's papers, and discovered that old Pafnuty was a hell of a guy. He also owned some really classy suits (St. Petersburg chic, circa 1860), which he wore when he was demonstrating some of his more practical inventions, such as a device to row a boat more efficiently, or a hand drive for a wheel chair that keeps your hands clean. I sometimes think that they must have had more fun in those days.

The life of this Research Professor (Emeritus), is not as tranquil as I had imagined it would be. I thought that giving up teaching and administration would free up vast amounts of time for research, and to some extent that is true. I have had the time to pursue a number of questions that Alan Schwartz and I had to put aside in our research program, some because they were too difficult at the time, some



Bill Connett

because they took us too far from our areas of expertise. I am happy to report some success on the first kind of questions (A classification of the n-dimensional polynomial hypergroups). However in the second area, I have spent more time than I care to admit, and so far to no avail, on rethinking the MP3 algorithm using the product formula for the prolate spheroidal wave functions that Alan and I published in 1993.

One reason that the amount of time available for research does not seem so vast, is that in 2003 my wife was recruited from the Department of Surgery at Washington University to the Department of Surgery at the University of Michigan, in Ann Arbor. I now spend one to two weeks a month in Ann Arbor, and this commuting takes its toll. On the other hand, maybe old Pafnuty did not have more fun in those days of yore. Hmm. Maybe I need some new suits.

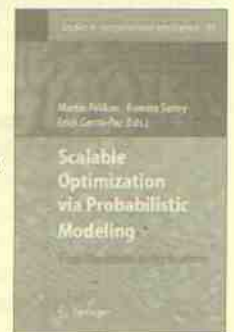
## MARTIN PELIKAN PUBLISHES A NEW BOOK "SCALABLE OPTIMIZATION VIA PROBABILISTIC MODELING: FROM ALGORITHMS TO APPLICATIONS"

Martin Pelikan, Assistant Professor of Computer Science at UMSL and Director of the Missouri Estimation of Distribution Algorithms Laboratory (MEDAL), and two of his former colleagues from the University of Illinois, Kumara Sastry and Erick Cantu-Paz, have published a new edited book. *Scalable Optimization via Probabilistic Modeling* (Springer, 2006) presents a comprehensive picture of a new category of optimization procedures called Estimation of Distribution Algorithms (EDAs) and should be of interest for optimization researchers and practitioners alike.



Martin Pelikan

Well-known author and researcher, David E. Goldberg, Distinguished Professor and Director of the Illinois Genetic Algorithms Laboratory (IlligAL) at University of Illinois says, "Pelikan's newest book focuses like a laser beam on one of the hottest topics in evolutionary computation over the last decade or so: estimation of distribution algorithms (EDAs). EDAs are an important current technique that is leading to breakthroughs in genetic and evolutionary computation and in optimization more generally." Duane D. Johnson, Professor and Bliss Faculty Scholar, University of Illinois at Urbana-Champaign highlights the importance of the book for practitioners: "the book brings together a selection of experts that (1) introduce the current methodology and lexicography of the field with illustrative discussions and highly useful references, (2) exemplify these new techniques that dramatically improve performance in provable hard problems, and (3) provide real-world applications of these techniques."





Martin Pelikan joined the University of Missouri in St. Louis in 2003 and recently started the Missouri Estimation of Distribution Algorithms Laboratory (MEDAL) located in the Department of Mathematics and Computer Science at UMSL. Illinois's Goldberg thinks that the book, the laboratory, and the growing funding are signs of good things to come. "Martin Pelikan's success in attracting research funding, the establishment of his lab, and the publication of his second book signal in bold strokes that UMSL and St. Louis are now at the center of the estimation of distribution universe. These signs bode well for further funding, technology transfer, and first rate scholarship in the years to come."

### ADRIAN CLINGER IS BUILDING A "THEORY OF EVERYTHING" (SOME STRINGS ATTACHED)

Adrian Clinger joined the Department of Mathematics and Computer Science at UMSL in the Fall of 2006. Originally from Romania, Adrian is a graduate of University of Bucharest. He arrived in the United States in 1997 and for the next five years, pursued graduate studies in mathematics at Columbia University in New York City. He received his PhD in May 2002. Prior to his arrival at UMSL, Adrian held post-doctoral positions at the Institute for Advanced Study and Stanford University.



*Adrian Clinger*

Adrian's research interest lies in the field of algebraic geometry, with a special emphasis on the mathematical aspects of string dualities. This study straddles the interdisciplinary juncture between classical mathematics and modern theoretical physics and is distinguished by both its subtle blend of geometry and number theory and its simultaneous contributions to the cutting edge in mathematics and physics. The traditional interaction between mathematics and physics, wherein mathematics provides the language for formulating physical theories and these theories themselves become highly structured examples which serve to motivate mathematical conjectures, has reached a new level over the last two decades with the advent of string theory. Belief in the existence of this theory as a Theory of Everything has led physicists to make conjectures in geometry. The interest of mathematicians in this interplay comes from the fact that the sorts of mathematical statements predicted in this way have turned out to be quite novel, producing conjectures unlike anything that has been seen before. Much of the progress the last fifteen to twenty years in large areas of geometry traces back to this source.

One of the most important results of Adrian's research concern the geometrical aspects of one particular string duality, the F-Theory/heterotic duality. This duality predicts a novel and surprising correspondence relating classical objects in algebraic geometry: K3 surfaces, elliptic curves and holomorphic principal bundles.

### QINGTANG JIANG



*Qingtang Jiang*

Dr. Qingtang (Quinton) Jiang joined UMSL in Fall 2002. He was promoted to Full Professor in 2006. Dr. Jiang earned his Ph.D. in Mathematics from Peking University, China, in 1992. Before he joined UMSL, Dr. Jiang held visiting positions at the National University of Singapore, University of Alberta, and West Virginia University. Dr. Jiang is also a member of the Institute of Computational Harmonic Analysis, led by Curator's Professor Charles K. Chui.

At UMSL, Dr. Jiang taught various courses, including Applied Math I, Computational Curves and Surfaces, Functions of a Complex Variable (both undergraduate and graduate courses), Introduction to Differential Geometry, and Numerical Analysis I.

Dr. Jiang offered Special Readings and Directed Reading to undergraduate and graduate students. Dr. Jiang also advised and is advising Ph.D. students.

Dr. Jiang's research interests include (1) wavelet analysis, and (2) its applications to image compression and signal classification, and (3) computer aided surface design. Dr. Jiang has made contributions in the areas of the study of approximation order and smoothness analysis of Wavelets, construction and applications of Wavelets to image/signal processing. One of his most important results in these areas is about the algorithm for the smoothness analysis of multi-wavelets. Multi-wavelets is a new type of wavelets possessing all the desirable properties such as high approximation order, short support, high smoothness order, and symmetry, which cannot be attained simultaneously by scalar (traditional) orthogonal wavelets. Dr. Jiang developed with his collaborator a simple and stable algorithm to provide the smoothness order of this type of wavelets. This algorithm is used by research groups at other universities.

Dr. Jiang's most recent achievements in research are on the vector subdivisions for surface design. Subdivision is an efficient iterative process to generate surfaces. It is being widely used in computer animation, computer-aided design and other industrial sectors. However, the current approach (scalar-valued schemes) cannot provide a desirable interpolatory subdivision scheme. By using the vector subdivision approach, Dr. Jiang and his collaborator introduced an innovative concept of the interpolatory matrix-valued subdivision scheme. Corresponding to this definition, they have constructed interpolatory matrix-valued schemes with desirable smoothness order and minimum template sizes. In addition, they have constructed interpolatory matrix-valued schemes based on bivariate splines (piecewise polynomials of two variables). Since splines provide close-form and analytical representations of the subdivision surfaces, these schemes are very appealing to CAD/CAM applications.



## LIFE IN ST. LOUIS (BY HENRY KANG)

When I was asked to write about myself, I looked back and realized that it's already been more than three years and a half since I joined UM-St. Louis, so in a way it feels like I'm a bad student trying to do homework way after the deadline (which I normally do not accept as an instructor). Anyway, I appreciate this opportunity and I will try to write something not too boring for the readers.



Henry Kang

Let me begin with my childhood. I was born in South Korea (note: North Korea = bad; South Korea = good), but I grew up as a kid in New York City, as my father had a job there working for some international trading company. Hence, I had to learn English before I got to know my mother language, and I ate McDonald's before I tried Asian junk food. I guess that explains why to this day I still love burgers and fries too much for an Asian guy. Even after my family returned back to Korea, I was often viewed by my friends as some kind of a foreign kid. I was rather dark-skinned for a Korean, and I spoke English better than Korean at the time. In addition, every year I happened to be the tallest, biggest guy in my class (except for one year when we had a local Judo champion in my class), and I preferred burgers and hotdogs over Korean noodles and kimchi. In fact, it was true that in my mind I always had this thought that some day I would get back to US to work for some international company, just as my father did. Now that I see myself working here in UM-St. Louis, I guess that expectation was not too far off.

While my job here is to do teaching and research in the field of computer science, I've always had a passion for two other things in my life: art and sports. As a kid, I loved drawing and sketching so much that I was often scolded by my school teacher as I filled all the walls and tables in the classroom with my fascinating (?) artwork. It is not a coincidence that my major research area is computer graphics. In fact, it strongly influenced my decision to major in computer science in the first place (because I knew it would give me a chance to study computer graphics). As for my other passion, sports, I love all the kinds. Not only do I love watching them, but I also love playing them myself. It's kind of funny that I fell in love with a different kind of sport in each chapter of my life. As I spent my early childhood in US, my first favorite sport was baseball. Being the biggest guy in my class, I was naturally selected as a clean-up hitter, but I preferred batting third, just like Albert Pujols in the St. Louis Cardinals. The reason was simple: you are guaranteed to bat in the first inning (and I hated waiting). Speaking of the Cardinals, I believe it is my fate to be living in St. Louis, since the Cardinals had been my favorite major league baseball team long before I got a job in St. Louis! I was especially drawn by their power offense that once manhandled Chan Ho Park, the first ever Korean major leaguer, with two grand slams in a single inning (which remains a major league record). So imagine how excited I must have been last fall, when the Cardinals won the championship for the first time in the last 24 years. I mean 24 years! And I got to witness it right here in St. Louis, the so-called baseball heaven. Am I

the luckiest guy in the world or what? To properly pay tribute to them for their feat, I brought my whole family to the championship parade in downtown, saluted the players and celebrated with the crowd. As a sports fan, it was one of the happiest moments in my life.

Going back to my original subject, as I got into the middle school, I quickly became enthusiastic about playing soccer, which had one big advantage over baseball: you don't have to wait for your turn to be a hero. You just run to the ball and kick it into the net as many times as you can. It's that simple. In high school, I had to play basketball, not just because I was still the tallest guy around, but because playing basketball was the easiest way to attract girl students (playing soccer was viewed by girls as rather "uncivilized"). Then in my college years, I found it increasingly difficult to gather people to play group sports, so I focused on playing tennis. And just how much was I into it? As I recall, I was always dressed in a tennis outfit and brought my tennis rackets to my classes (which might have offended some professors). And I videotaped all the live matches of tennis greats like Boris Becker, Pete Sampras, Andre Agassi, and so on, for later review. Then when I was admitted to my graduate school, I realized there was no tennis club for graduate students, so I made one myself by gathering 30 or so members, and elected myself as the club president, then I happily served as a long-term dictator. This madness eventually slowed down as I was fortunate enough to meet a beautiful girl named Su, who would become my wife after 6 years of dating. And after I joined UMSL, well, I could hardly find time even for one-on-one sports, so I turned to solo sports such as running or swimming. These kinds of do-it-alone sports, however, are tough to keep doing as you always break a promise to yourself, which explains why I'm getting fat every day (and my wife is getting tired of having to buy new pants for me).

Well, I guess that's about it. I'm not sure if this has been enough of a story to tell about myself, but I'd better stop here and let other people write something more valuable for this newsletter. Let me conclude my story by mentioning that my life in St. Louis, with or without sports, has been the most gratifying and humbling chapter for me, as it has been full of pleasant surprises and new challenges, much more so than my prior student era, and I'm trying to enjoy every minute of it. I love working in UM-St. Louis, and I'm grateful to have an opportunity to fulfill my dream, that is, to explore the world of computer graphics and share the experience with students. Is there anything more joyful than this? Probably not, except there's one thing that comes to my mind: my daughter Jane, born in St. Louis just 21 months ago. She is rather shy and doesn't speak much yet, but her smile, and a dazzling one at that, makes me realize that I'm indeed the luckiest guy in the world, for which I'm eternally grateful to God.

## UDAY CHAKRABORTY EXCELS AT UMSL

Uday K. Chakraborty joined UMSL as an assistant professor of computer science on 01/01/2001 and was promoted to associate professor with tenure with effect from 09/01/2004. Uday received a bachelor's in Electronics Engineering, a master's in Computer Engineering, and a PhD in Computer

