Paul Sivilotti Awarded 2012 Alumni Award for Distinguished Teaching

Join us in congratulating Associate Professor Paul Sivilotti, who received a 2012 Alumni Award for Distinguished Teaching. The university's president, E. Gordon Gee, presented the award in a surprise classroom visit. The Alumni Award for Distinguished Teaching is given annually to a highly selective group of faculty for excellence in teaching and is sponsored by the Alumni Association and the Office of Academic Affairs. Recipients are nominated by students, alumni and fellow faculty.

A student who nominated Sivilotti wrote, “Dr. Sivilotti has been a constant source of inspiration, encouragement and exciting challenges...students are taught the popular industrial-strength programming language Java with elegance and best-practices in mind.” Another student noted how dedicated Sivilotti is to teaching and wrote, “Paul eschews adopting one particular technological ideology in favor of staying flexible and adaptive to his students’ needs. He never ceases to impress me.” Associate Chair Bruce Weide, who works closely with Sivilotti, has even taken the time to sit in on Sivilotti’s seminars saying, “It is simply a treat to be in one of Paul’s classes.”

Sivilotti joined the department in 1998 after receiving his PhD in Computer Science from the California Institute of Technology, where he also earned his Master's Degree. Originally from Canada, he earned his BScH in Biochemistry, and Computing and Information Science from Queen's University in Kingston, Ontario.

Sivilotti teaches courses in distributed systems, software engineering, mobile application development and programming in Java. Sivilotti is a three-time winner of the Department Outstanding Teaching Award and is active in furthering education excellence in engineering. This past year, he was invited by the National Academy of Engineering to present at the Frontiers of Engineering Education Symposium. Sivilotti designed a course for undergraduates, CSE 421 “Software Development in Java” to better prepare them for large-scale projects in upper-level course work.

Together with his graduate students, he has developed a variety of kinesthetic learning activities, a pedagogical tool involving physical activities to illustrate and reinforce course concepts. Sivilotti is also active in a number of outreach activities, including workshops to introduce computational thinking to middle school students. Sivilotti supports many CSE student initiatives, he meets regularly with prospective undergraduates and their parents, and he serves as the faculty advisor for the university's branch of the Association of Computing Machinery-Committee on Women (ACM-W).

In addition to his work in the classroom, Sivilotti's research focuses on tools and techniques for developing high-confidence distributed software. He is particularly interested in the challenges posed by loosely-coupled distributed systems. He has won three best paper awards at prestigious conferences and is part of an NSF-funded team researching autonomous vehicles.

Sivilotti is the second CSE faculty member to receive this award; Dr. Tim Long was a recipient in 1990.
Dear CSE Alumni, Parents, Friends, and Colleagues,

In this 2012 Spring CSE Newsletter, we again highlight exciting stories of our faculty, students and alumni. At the end of putting together each newsletter, we always already have a group of achievements ready for the next issue, showing the endless source of accomplishments for the CSE family at Ohio State.

I would like to mention two representative stories in this issue based on our principle of “Students First.” CSE faculty Paul Sivilotti is a recipient of 2012 Alumni Award for Distinguished Teaching. This award is given to a highly selective group of professors at Ohio State for their teaching excellence. The rigorous reviews at multiple levels are based on insightful comments from many students, alumni and colleagues. On the student side, CSE graduating senior Marc Khoury has been awarded a 2012 Churchill Scholar Fellowship from the Winston Churchill Foundation. With this fellowship, Khoury, who has been mentored at Ohio State by CSE faculty Rephael Wenger, will pursue an MPhil in Advanced Computer Science at Cambridge, where he will work in geometric modeling. After he completes his Churchill Scholar program, he will begin his NSF Fellowship, studying at the University of California, Berkeley.

The field of CSE is making horizontal impact in every corner of the society. We change the world based on the core computing technologies we have developed. This is particularly important for the CSE departments in the US to maintain strong leadership in the IT fields of the world. We are also making strong efforts to connect ourselves to many other fields. We have made requests for additional faculty positions for both core areas and multidisciplinary areas.

Please continue to keep us informed about your progress in your life and work. We will have more exciting stories to share in the next issue of the Buckeye Blog.

Xiaodong Zhang
Chair and Robert M. Critchfield Professor
Computer Science and Engineering

A Proud Day
CSE students pose after winter commencement. Siddhesh and Raviprakash received their master’s degrees and are off to Phoenix Integration in Virginia and to Fusion, IO, respectively. Xiangyon was awarded his doctorate and has accepted a position at Google.

From left: Raghunath Raja Chandrasekar, Siddhesh Pai Raikar, Dr. Xiangyong Ouyang, Raviprakash Darbba, Sreeram Potluri and Vilobh Meshram
Dr. Ferdi Scheepers is the Effects Supervisor and Technical Director (TD) at Pixar Animation Studios. He's currently working on Pixar's forthcoming movie *The Good Dinosaur*. Scheepers joined Pixar in January 2002 as a Global Technology TD, working on dynamic wrinkle mapping and other tools for *The Incredibles.* In his 10 years at Pixar, Scheepers has rotated between doing production-related software development, creating, leading and supervising computer graphics (CG) effects for animated features and short films. Scheepers' feature film credits include several Academy Award-winning animated feature films (*The Incredibles*, *Ratatouille*, *Wall-E* and *Toy Story 3*) and the Golden Globe-winning animated feature film, *Cars.* "I love working with the very talented people at Pixar. It fascinates me that so many experts in a variety of disciplines can work together to create a work of art," Scheepers said.

Scheepers is also credited as Effects Lead for the animated short film *Tokyo Mater* and as Effects Supervisor for the Academy Award-nominated short film, *La Luna.* Scheepers co-developed a volumetric rendering system called Atmos, which is used at Pixar to shade and render volumetric effects such as clouds, dust, fire and explosions. The system allows effects artists to build complex volume shaders and fine-tune them for specific effects, in much the same way as shading networks for surface shaders are constructed. In addition to Atmos, Scheepers has developed and deployed several production tools for creating procedural CG effects, including tools to build complex structures such as the trash towers in *Wall-E*, and tools to model broken structures such as shattered glass and collapsed buildings in *The Incredibles.*

For Cars, Scheepers developed a system to break up the road surface in the fictional town of Radiator Springs, below. This work included creating the effects for the wrecked road sequence and creating several versions of the wrecked road model in stages of repair. As sequence lead on *Wall-E*, Scheepers was responsible for the reconnaissance ship landing sequence and for deploying and supporting Atmos. He also created the falling trash tower effect. As sequence lead on *Toy Story 3*, Scheepers was responsible for the effects and simulation in seven sequences, including the scene where Buzz escapes from the Caterpillar room in the day care and when the toys are inside the dump truck on the way to the trash dump. Here, Scheepers used a proprietary, programmable rigid body dynamics simulator to create models of ropes and deformable trash. When asked about his favorite project, Scheepers said "My favorite project is always the current one! I'm the Effects Supervisor for *The Good Dinosaur,* an animated feature film scheduled for release in 2014." *The Good Dinosaur* asks the question what if the asteroid that killed all the dinosaurs missed Earth and these creatures never went extinct.

Before joining Pixar, Scheepers worked at the CSIR Satellite Applications Centre in South Africa as technology manager and manager of the earth observation research and development program. He worked on applying 3D computer graphics technologies to the fields of remote sensing and geographic information systems, developing new applications in geo-spatial visualization and analysis. Scheepers received his PhD from Ohio State in 1996 for research in anatomy-based modeling of the human musculature. While at Ohio State, Scheepers worked at ACCAD, developing software tools for animation artists and for medical applications. He also developed several software tools for award-winning artist and computer graphics pioneer, Professor Emeritus Charles A. Cauri.

Scheepers was born and grew up in South Africa. He developed an interest in animation at an early age, creating short hand-drawn animation and claymation pieces using an 8-mm film camera with a single-frame advance function. In high school, while attending one of the first computer studies courses offered in South Africa, Scheepers completed his BSc. Honors and MSc degrees, both Cum Laude, majoring in Computer Science and Computer Graphics. He received the Nico Diederichs Mining Industry Research Scholarship for overseas advanced study that enabled him to attend Ohio State. He lives in Pleasant Hill, California, with his wife Ronel and three sons, Nicolas, Conrad and Dewald.

Yu-Chee Tseng
Dean of the College of Computer Science, National Chiao-Tung University, Taiwan

Dr. Yu-Chee Tseng received his PhD in Computer and Information Science from the Ohio State University in 1994. In 2004 he joined the faculty at the National Chiao-Tung University in Taiwan and is now the Dean of the College of Computer Science for the University. Previously, Tseng served as the Chairman from 2005 to 2009 and Chair Professor since 2011 at the university.

While at Ohio State, Tseng worked with Professor Ten-Hwang (Steve) Lai. After graduating, Tseng became involved in the research of wireless networks. Tseng is well known for his technical contributions in the area of wireless and mobile networks. His most distinct contribution is the discovery of the “Broadcast Storm Problem” in mobile ad hoc networks and the related solutions. When radio signals are sent over a geographic area frequently, they are likely to overlap with one another. This results in collision and contention amongst the signals, known as a “broadcast storm.” Being able to resolve these signal problems is necessary to establish networks of wireless signals used in Wi-fi and cellular phones.

In addition to resolving practical problems in wireless networks, Tseng’s contributions in the field are significant in the scholastic development of wireless network research. More than 3,000 articles reference his work. Further, Tseng’s results have been used by other researchers who have applied his solutions to many kinds of wireless networks, such as sensor networks, mesh networks and vehicular networks. Tseng has also made original contributions to the field of wireless sensor networks. He has authored a series of pioneering papers that address the coverage and real-life applications of sensor networks. These works have been cited over thousands of times and have significantly influenced the field.

The training that Tseng received at OSU helped him greatly in his academic career. He learned how to identify fundamental issues when encountering complex research topics. According to the Google Scholar search, the extraordinary scientific contributions he made can be reflected by more than 10,000 citations referring to his research works. With an h-index of 50, he stands out as one of the top-tier researchers in his discipline. According to ScienceWatch.com, he was ranked number 6 by paper count and number 12 by the number of citations per paper in the category of “wireless and mobile networks” from 1995 to 2005.

As a Buckeye alumumn, Tseng is most proud of being a recipient of the Distinguished Alumnus Award from OSU in 2005. Tseng also received three impressive Outstanding Research Awards, awarded annually to the top 5% of researchers by the National Science Council, Taiwan. In 2003, he received the Best Paper Award at the International Conference on Parallel Processing (ICPP). Tseng is still very active with research; he has received the Elite I. T. Award (2004), and the Y. Hsu Scientific Paper Award (2009). His current research interests include mobile computing, wireless communication, and parallel and distributed computing. He has served on the editorial boards of IEEE Transactions on Vehicular Technology from 2005 to 2009, IEEE Transactions on Mobile Computing from 2006 to 2011, and currently serves on the board of IEEE Transactions on Parallel and Distributed Systems, a position he has held since 2008. Recently, he was recognized as an IEEE Fellow “For fundamental contributions to wireless and mobile networks.”

In 2011, Tseng helped organize the International Conference of Parallel Processing in Taipei (see photo at right). Co-organizers of the conference included Ohio State Professors Mike Liu, Steve Lai and Department Chair Xiaodong Zhang. Many people joined to celebrate the 40th anniversary of the prestigious conference in Taipei. According to Professor Liu, this was “the most successful ICPP in the past 10 years.”

Beside research work, Tseng’s favorite activity is to travel around national parks in northern America and camp. He hopes that someday he can bring his family back to Columbus and visit the Buckeye Village, where his first daughter was born and enjoy the wonderful atmosphere of OSU.
Parthasarathy's research interests are in data mining, management and analysis at Wright State. Professor Ucar was a part of the Data Mining Research Lab under Professor Srinivasan Parthasarathy at Ohio State. She received the Computing Innovation Fellowship in 2009. Her research interests are in scientific data mining and computational biology. "In particular, I focus on the development of algorithms for integrating and mining diverse high-throughput genetic and epigenetic data sets," Ucar said.

Best Paper Win For CSE Alumnus

CSE alumnus Gabe Brown, BS ’96, co-authored an experience paper, "Scrum and Engineering Practices: Experiences of Three Microsoft Teams" and won an IEEE award for Best Experience Paper and the Empirical Software Engineering and Measurement (ESEM) Best Industry Paper Award. The paper’s results show that the three teams were able to improve quality, productivity and estimation accuracy through the combination of Scrum and nine engineering practices.

"The paper established empirical benefits that contribute to making Scrum effective for quality software. Many teams claim that Scrum alone is enough to make a quality product however, teams that do not couple objective measures of quality into their product end up with "flaccid scrum" which the team is producing results but cutting corners," Brown said. "This paper shows that teams can double quality with only taking 15-20% longer than teams that do not leverage quality gates."

Brown is now the Engineering Manager for Disney Interactive in Bellevue, WA, making Playdom Facebook games. He had previously worked at Microsoft, producing projects from Microsoft Research for the support organization. In his spare time, he enjoys teaching Agile Development at the University of Washington.

Alumni’s Research Team Searching For Answers in Disaster-Related Tweets

Ohio State alumni and Wright State University Professor, Amit Sheth and CSE Professor Srinu Parthasarathy are a part of a research team that is studying how the use of social media is reshaping the way people around the world respond to natural disasters and other large-scale emergencies. The team is developing new ways to extract meaningful information from hundreds of thousands of Twitter ‘tweets’ and other messages that are posted during emergencies. Sheth believes that they have just scratched the surface of the potential of this project. The National Science Foundation is funding their research under a $750,000 Social Computational Systems (SoCS) program grant, which includes $480,000 to OSU and $270,000 to WSU.

"In any emergency, any disaster, these days you see the use of social media," Sheth said. "You see it in developed worlds and you see it in developing worlds." Sheth received his CIS master’s degree in 1983 from OSU and his doctorate in 1985. He is the LessigNexis Ohio Eminent Scholar for Advanced Data Management and Analysis at Wright State. Professor Parthasarathy’s research interests are in data mining, bioinformatics and clinical informatics, high performance computing, network science, and database systems.

OSU Alumna Helping to Disprove Well-Known Theories

OSU alumna, Duygu Ucar, PhD ’09, is a part of a research study at Stanford University that is examining how organisms inherit traits. In the study, the researchers found that blocking or modifying the expression of any of the three key proteins in a laboratory worm increases the life span of not just the original specimen, but also the organism’s descendants. This experiment indicates that trans-generational inheritance of longevity does occur due to modulations of proteins. This runs counter to many standing principles and laws of genetics, including Mendel’s laws.

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Alumni: We Want to Hear From You!

Win A Pair of OSU Football Tickets!

Do you have an update to include in the next alumni newsletter? Do you have any suggestions for topics you would like to see covered? Do you have any photos from your college days or today that we can include? We want to hear from you! E-mail us your updates, photographs and suggestions to Carrie Stein at alumni@cse.osu-state.edu or mail them in the attached envelope. We will enter your name in a drawing for a pair of football tickets to a home game for the 2012 season. Winners will be notified this summer and announced in our autumn newsletter.
Yusu Wang

Understanding the Geometric Structure of Hidden Space

Professor Yusu Wang is using her research to get a handle on the amount of information available in this day and age. In this current era of information, large amounts of complex high-dimensional data are routinely generated across science and engineering. Understanding the geometric structure of the hidden space generating this data—such as inference and modeling based on this understanding—is a fundamental problem in a variety of applications in computer science, applied mathematics, statistics, and natural sciences.

Geometry and topology form a natural platform for understanding structures in data and shape analysis. Traditionally, the field of computational geometry has been one of the main areas to study discrete geometric structures, focusing on both their algorithmic and combinatorial aspects, as well as on designing new discrete structures. However, as modern data becomes more complex and higher-dimensional, new thinking and approaches need to be injected to address the new challenges.

"Detailed geometrical information becomes expensive to describe and learn for high dimensional data. So then what we asked: what meaningful information can you still capture, hopefully with some sort of guarantees? Naturally you want something coarser than the geometry information. That's where topology comes in the picture. We're interested in the connectivity of the space," Wang said.

"The standard joke is that topologists are those people who cannot tell the difference between a donut and a coffee mug..." Wang said.

"I'm interested in shapes, when I say that, I'm using it in a very broad sense. Shape can mean a 3D object, or high dimensional spaces, or even something as abstract as a graph. Shape analysis is required everywhere. In drug design you may want to design a molecule that shapes fits and blocks the bad reaction site like a piece of 3D puzzle. Or you may want to look at the space of images and figure out where to segment this space and classify these images. Also, very often, the data given here can be recast in a high dimensional setting," Wang said.

As an example of how topological structures are applied to high-dimensional data analysis, a center problem in molecular structural biology is to understand molecular dynamics. With the rapidly increasing power of modern computers, huge amounts of molecular simulation data are generated. An important question is how to analyze and interpret such massive and complex data. In particular, an important concept associated with understanding molecular dynamics is the so-called protein energy landscape, which is a scalar field defined on the protein conformational space, where the function value at each point in this space is the energy of that conformation.

A visualization of this landscape can greatly facilitate the exploration of molecular simulation data, where researchers can directly "see," select, and explore the data. One can use dimensionality reduction methods which typically aim to embed the data while preserving distance metric. However, given that the intrinsic dimensional of the protein conformational space seems to be much higher than three; significant distance distortion will most likely be unavoidable. Thus aiming to preserve distance metric may not be meaningful in such a setting. Wang, together with her student William Harvey, and her collaborators instead focus on preserving certain topological structures, which, by considering only connectivity of spaces, describes input data at coarser levels and potentially makes it easier to preserve.

"See the figure below for an example, where a 2D terrain metaphor is created for the high-dimensional protein energy landscape that preserves the same contour tree information. Roughly speaking, this means that mountains peaks and valleys in the 2D terrains correspond to high-dimensional mountains peaks and valleys in E, and when two valleys (mountains) merge in 2D, their corresponding high-dimensional counterparts also merge. Furthermore, the sizes (volumes) of the 2D mountains / valleys are also proportional to those of their high-dimensional counterparts. Software based on this visualization is developed, linking bio-chemical information and protein structural information with the landscape visualization. In general, there are many challenges involved to bring geometric and topological methods to analyze high dimensional complex data. For example, many geometric and topological structures are developed in the smooth high dimensional spaces, or even something as abstract as a graph. Shape analysis is required everywhere. In drug design you may want to..."
Faculty Updates

Shen Leading OSU Effort in Big Data Initiative

As part of the Obama administration’s Big Data and Research and Development Initiative, The Department of Energy has awarded $25 million in funding to establish the Scalable Data Management, Analysis and Visualization (SDAV) Institute. Led by the Energy Department’s Lawrence Berkeley National Laboratory, the SDAV Institute will bring together the expertise of six national laboratories and seven universities to develop new tools to help scientists manage and visualize data on the Department’s supercomputers, which will further streamline the processes that lead to discoveries made by scientists using the Department’s research facilities. The need for these new tools has grown as the simulations running on the Department’s supercomputers have increased in size and complexity.

OSU’s effort is led by Professor Han-Wei Shen. OSU’s role is to support the DOE’s science applications with large-scale data analysis and visualization capability. Specifically, the creation of cutting-edge flow analysis algorithms and tools that can run on multi-core, many-core, and massively parallel systems is being developed. For the next five years, OSU will work closely with the SVAD partners to achieve this goal.

By improving our ability to extract knowledge and insights from large and complex collections of digital data, the initiative promises to help solve some of the Nation’s most pressing challenges. “In the same way that past Federal investments in information-technology R&D led to dramatic advances in supercomputing and the creation of the Internet, the initiative we are launching today promises to transform our ability to use Big Data for scientific discovery, environmental and biomedical research, education, and national security,” said Dr. John Holdren, Assistant to the President and Director of the White House Office of Science and Technology Policy.

MVAPICH To Support World Class Supercomputer

Professor Dhawarewar K. (DK) Panda is collaborating with the Texas Advanced Computing Center (TACC) at the University of Texas, Austin to build a world-class supercomputer. Supported by the National Science Foundation and in partnership with Dell and Intel, Stampede will support the nation’s scientists in addressing challenging scientific and engineering problems. The supercomputer is expected to be up and running in January 2013 and would deliver a 10 Petalop peak performance. “The Stampede system at TACC will push the frontier of Petascale supercomputing with commodity computing platform, commodity networking technology (InfiniBand) and accelerators. The OSU MVAPICH team is happy to participate in this project with TACC and associated partners,” Panda said.

MVAPICH, the software developed by Professor Panda and his research group, the Network-Based Computing Laboratory, will help run Stampede. MVAPICH stands for MPI over Infiniband and delivers the best performance, scalability and fault tolerance for high-end computing systems and servers using InfiniBand. MVAPICH improves the performance of the supercomputer by connecting traditional supercomputing software with innovative networking technology. It will increase the data flow speed significantly. “We look forward to driving this system with MVAPICH2 software and delivering multi-Petalop performance to the large number of cutting-edge applications targeted for this system,” Panda said. MVAVICH recently surpassed the 100,000 download mark and is used world-wide in 66 countries by more than 1,850 organizations.

Design and Implementation of Two-Core Technologies for Big Data Analytics

A critical challenge being faced today in society is how to effectively respond the massive and quick growth of online data, which is simply called “big data.” For example, more than 70 Terabyte compressed data is added every day in Facebook, the world largest social network, and this data amount continues to grow. Traditional database systems, including parallel database systems, are not prepared for such a “data tsunami” in terms of the scale, performance and cost. This requires that the new data processing technology store and manage big data in a performance-and-cost-efficient manner for deep and comprehensive analytics of the whole datasets.

The MapReduce programming model developed by Google and its open source implementation Hadoop developed by Yahoo! have laid a foundation as a big data processing engine for various applications. Facebook has released an open source data warehouse system called Hive on top of Hadoop, which has been widely used in the world besides its own big data processing. Two critical problems related to big data processing have been identified by CSE Chair and Professor Xiaodong Zhang and his big data research group including research scientist Rubao Lee, PhD students, Yun Huai, Tian Luo, and Yuan Yuan. The first problem is that large and complex data sets are distributed in clusters of heterogeneous computing nodes. Collaborating with several Facebook engineers, they developed a data placement structure called RCFile (Record Columnar File) that can effectively utilize the network and storage resources. The RCFile paper was presented and published in the International Conference of Data Engineering (ICDE’11). RCFile has been adopted in the Hive data warehouse that is used by many organizations for big data processing. Several other big data processing systems, such as HCatalog of Hortonworks and Pig Latin of Yahoo! have also adopted the structure of RCFile in their systems.

The second problem identified by the Professor Zhang’s research group is the low efficiency of translating SQL to MapReduce programs in existing big data processing systems. Writing MapReduce programs is a very expensive process for many organizations, and an automatic translation from standard database queries would greatly improve the productivity. Professor Zhang’s research group has developed YSmart, a correlation-aware SQL-to-MapReduce translator that applies a set of rules to generate the minimum number of MapReduce jobs to execute multiple correlated operations in a complex query. YSmart significantly reduces redundant computations, I/O operations and network transfers compared to existing translators in Hive and Pig Latin. This work received a Best Paper Award at ICDCS 2011. YSmart has been patched and will be merged into Hive in its data processing production systems for many applications. An independent version of YSmart has been downloaded by several hundred organizations in the first week of its release. (http://ysmart.cse.ohio-state.edu).

NVIDIA awarded DK Panda a grant to support the development of an innovative MPI device for Infiniband clusters with GPUs. He served as the Program Chair for the International Conference on High Performance Computing (HPCC) 2012. In addition, he gave the following three keynote speeches: HPCA Advisory Council in Jinan, China; International Workshop on Co-Designing Beijing, China and the HPCA Advisory Council Workshop in Tel Aviv, Israel.

Srinivasan Parthasarathy served as an invited panelist at the ICMD 2011 panel on Big Data Analytics in the Easicsale Era and served as an invited panelist at ICDE 2012 panel on Careers in Data Engineering.

Faculty Updates


Rajiv Rammath, along with CSE Professors Roger Crawfis and Paul Sivilotti, wrote Android 3: SDK Programming For Dummies.

Misha Belkin is the Associate Editor for IEEE Transactions on Analysis and Machine Intelligence. In addition, he serves as the Action Editor for the Journal of Machine Learning Research.

DeLang Wang gave a plenary lecture entitled, A Classification Approach to the Cocktail Party Problem at the 2011 International Conference on Neural Information Processing (ICCPNP’11) in Shanghai in November.

Raghu Machiraju gave the Grand Rounds Talk at the Milton S. Hershey Medical Center at Penn State University in February, entitled Quantitative Cellular Phenotyping in Tissue Microenvironments Unknowns - Interpreting Pathology Images Through Computer Analysis.

Anish Arora gave a keynote talk at the 13th International Conference on Distributed Computing and Networking in Hong Kong. He was also the keynote speaker at the 7th International Conference on Wireless Communications and Sensor Networks in India and gave an invited talk at the 7th International Conference on Wireless Communication and Sensor Networks in India ...

Tamil Dey gave keynote speeches at the SIAM/ACM Conference on Geometric Design and Physical Modeling and at the International Meshing Roundtable (IMR) in October. In addition, he gave an invited talk at the 13th International Conference on Topology Workshop on Identifying Order in Complex Systems at the Institute of Advanced Studies at Princeton in March.
**Student News**

**Khoury Named 2012 Churchill Scholar and NSF Graduate Research Fellow**

Senior Marc Khoury was named a 2012 Churchill Scholar and a National Science Foundation Graduate Research Fellow. The Winston Churchill Foundation awards 14 scholarships annually to graduating seniors in the US and recent graduates demonstrating exceptional academic talent, outstanding personal qualities and a capacity to contribute to the advancement of knowledge in the sciences, engineering, or mathematics. The NSF Fellowship recognizes and supports outstanding graduating students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master’s and doctoral degrees at accredited US institutions.

Khoury is from Strongsville, Ohio. As a freshman, Khoury began his research under Dr. Rehapeh Wenger, studying isosurface meshes, a tool for data visualization. As a sophomore, this work resulted in his first publication and a national presentation at the leading conference in computer visualization. This past summer, Khoury interned with AT&T Labs in their information visualization group, working on new techniques for generating large graph layouts in New Jersey. Following this, he spent fall quarter with Amazon.com in Seattle as a software development engineering intern in their fraud department.

Khoury has garnered an impressive list of recognitions from the College of Engineering, including an Undergraduate Research Scholarship, Computer Science & Engineering Founder’s Scholarship, the Woodley Scholarship, and his department’s Undergraduate Research Award. Outside the laboratory, he also participated in a variety of science outreach activities. He has served as a student advisor on the Undergraduate Engineering Honors Committee and the Department of Computer Science & Engineering’s Semester Task Force. One of Khoury’s goals is to share his passion for computer science with others and he has done so as a Peer Contact for the Undergraduate Research Office and as a tutor at Ohio State’s Math & Statistics Learning Center.

Khoury will pursue a MPhil in Advanced Computer Science at Cambridge, where he work in geometric modeling under Dr. Neil Dodgson. After he completes his Churchill Scholar program, he will begin his NSF Fellowship, studying at University of California, Berkeley where he will conduct research in mesh generation and computational geometry with Dr. Jonathan Shewchuk. His ultimate goal is to become a professor at a major university, teaching students and developing provably good meshing techniques to provide researchers in computational science with an array of high quality visualizing geospatial data in 3D. This work can help improve interactive 3D visualization of geospatial and similar data,” Chaudhuri said. The SAGE Information Visualization Journal also extended the authors an invitation to publish an extended version of the paper.

**Visualization Team Awarded Best Paper**

Professor Han-Wei Shen and his student, Abon Chaudhuri, co-wrote the paper A Self-adaptive Technique for Visualizing Geospatial Data in 3D with Minimum Occlusion that won a Best Paper Award at the Conference on Visualization and Data Analysis (VDA 2012) in San Francisco. The conference is part of the IS&T/SPIE Symposium on Electronic Imaging 2012. "This paper shows how to minimize the problem of occlusion when visualizing geospatial data in 3D. This work can help improve interactive 3D visualization of geospatial and similar data," Chaudhuri said. The SAGE Information Visualization Journal also extended the authors an invitation to publish an extended version of the paper.

Chaudhuri is a PhD candidate supervised by Professor Shen. He came to Ohio State in 2006. He works with fellow members of the GRAVITY research group on various problems related to flow visualization, high-performance visualization of large scientific data and information visualization. Before coming to Ohio State, Abon completed his undergraduate studies at Jadavpur University in Kolkata, India and interned at Oak Ridge National Laboratory and Argonne National Laboratory.

**Undergraduate Focus: Arathi Mani**

"This is one of those things that people think is supposed to be for men but it’s not, women can do it too." These are the words of CSE second year junior Arathi Mani, who is adamant about recruiting more women to the engineering field, particularly to her own field of computer science and engineering. Mani has become active in Women in Engineering (WIE) to achieve her goal.

WIE is a program at Ohio State that works to increase the number of women earning degrees in engineering and promote engineering education to girls.

"Through partnerships with alumni, corporations, and community and educational organizations, WIE develops innovative and exciting programming to introduce girls and women to the wide variety of careers and opportunities available to engineers. In creating a supportive and inclusive culture, WIE encourages students to reach their full potential as future engineering professionals," notes WIE Outreach Program Assistant Kerrie Kirkpatrick.

Mani was first exposed to the Women in Engineering program during middle school. "I started in 7th grade with WIE. I did a couple of their summer programs and that’s what got me interested in engineering. I then came to OSU and now I’m on the other side, sort of giving back and arranging all those programs," Mani said. "This year I started a paid position with WIE, working on their social media."

Mani’s goal is to help other girls who may be interested in the engineering program. "What we have going on is this mentoring program, that puts us in touch with high school students and we start chatting about engineering and women in engineering. We learned that students in the program worried there may be a bias against women in this field," Mani said. While the percentage of women in engineering has risen since 1978, there has been a drop in females getting degrees in this field recently. Mani is one of the many students who believe they can make a difference and improve these numbers. "Our outreach program can expand up to hundreds of students. CSE is one of those departments that don’t have many girls in it. [So] I do my bit to promote computer science within WIE," Mani said.

Mani has experienced what being a female minority is like first-hand saying, “It's something to get used to, having a lot of men in my classes.” That hasn't stopped her from getting involved though. In addition to her activities with WIE, Mani works with Professor Rajiv Ramnath working on the Android version of iShoe, an application for OSU game days. She has also worked on a search engine optimization for a professor at Yale University.

This year, she will intern for six months with Intel Corporation in Sacramento, California. During her internship she will be working on software for Intel's latest line of processors by combining the graphics card into the regular processors. While she’s not sure what direction within computer science she wants to go in, she’s excited at the prospects.

**6th Annual Student Research Poster Exhibit**

The 2012 Sixth Annual CSE Student Research Poster Exhibition was held on February 27th. CSE is now one of the largest graduate programs in the College of Engineering responding to the strong demand for talents of computing in both foundations and applications. The exhibition showed the students’ efforts in their research. Three winners were chosen from amongst twenty seven participants. Winners include PhD student Oleksiy Bursaryev for his poster entitled Animating Bubble Interactions in a Liquid Foam, PhD candidate William Hartmann for his work ASR Driven Top-Down Binary Mask Estimation using Spectral Prriers and undergraduate student Vahid Rajabian Schwart for his exploration of SAGA: Automated Validation for Synchronous Reactive Embedded Systems.

Above: From left: Jing Li, Derek Bronish and Rohit Prabhavalkar display their posters. The final photo shows the exhibit space.
National Science Foundation Funded Program Allows Students to Test Entrepreneurial Waters

NEWPATH is a National Science Foundation supported program at Ohio State in the department of computer science and engineering with the mission to educate, train, and nurture highly motivated students to become IT entrepreneurs of the future. NEWPATH uses a multipronged approach to achieve this mission. The program includes an academic approach to entrepreneurial skills, collaboration with other IT businesses and technical and business advice for the student led startup companies. The program is led by CSE faculty members Neelam Soundaram, Bruce Weide, David Lee and Rajiv Ramnath. In addition, entrepreneurship-focused faculty from the Fisher College of Business in particular Dr. Michael Camp, have contributed to developing NEWPATH students’ understanding of the business aspects of the start-up process.

Student members are required to complete an entrepreneurship minor and choose electives that focus on entrepreneurial issues specific to IT startups. Karl Meves, a current NEWPATH student, stated “NEWPATH was very instrumental in helping learn the fundamentals of building an IT business. I think NEWPATH helped set me up with the right connections.” Meves met his current business partners through NEWPATH and has gained confidence because of the IT centric classes and environment that the program fosters.

For hands-on experience in startup companies, the NEWPATH program works with TechColumbus to place students in internships in IT in central Ohio. Since these companies are startups and in many cases operating on a start-up budget, NSF funds are used to supplement the NEWPATH interns’ salaries. The startup internship experience allows participants to see first-hand the excitement and challenges of the development of a startup company. Some of these students have gone on to become permanent members of the startup after their graduation. In addition to supplementing interns salaries, NSF funds are used to support students’ attendance to events such as Startup Weekend and SXSW. Here, they have a chance to interact with successful entrepreneurs and hear about their successes as well as failures and make personal, lasting connections that are likely to be of great value to NEWPATH students encounter technical problems and search for funding in their future entrepreneurial activity.

The final and perhaps most important aspect of NEWPATH, is a weekly seminar where students discuss their internship experiences, technical and business-related ideas. NEWPATH student coordinator Zach Boerger said, “NEWPATH has basically helped foster my entrepreneurial passion and it also served as a great place to get some initial feedback from a group of smart, like-minded students. I’ve learned more about the whole process of starting a company, from idea to building the product to funding, as a result of becoming involved with and eventually leading the NEWPATH group.

The ultimate goal of all of this is to enable students to be confident and possess skills to become entrepreneurs by the time they graduate. Several NEWPATH students don’t wait until graduation to start their own businesses. They are launching IT startups while they are still in school.

Zach Boerger, a senior in computer science in engineering, has teamed up with OSU alum Andy Sparks and OSU product design student Carrie Phillips to create LaunchGram (www.launchgram.com). Launching in April, Launchgram will aggregate news and rumors about upcoming product launches in video games, movies, electronics and cars. The website creates a central location for information and manages the flood of updates about these products pertaining to future technological developments. The team has already raised $20,000 in seed funding through the 10xelerator program.

Karl Meves and Nick Knudsen, both current NEWPATH students, are working to develop uTap. uTap is a location based messaging platform built for iOS (and soon Android). uTap allows students to message students around them by posting a message from their location on a discussion with a certain size. Other students in the area are able to see these discussions and comment, save for later or private message the user. Meves explains how he got the idea, “I was sitting in the CSE computer lab and dreamed about being able to instant message everyone in the lab to ask a question about my homework assignment instead of queuing up a huge line for the two lab TAs… I had just gotten the iPhone 3GS and I soon realized this problem was easily solvable with an iPhone app.” Karl and Nick have also received seed funding through the 10xelerator program and are working to get their startup up and running.

Many Thanks to Our Alumni and Friends!
We appreciate the following alumni, faculty, staff and friends who directed their Ohio State gifts to the Computer Science and Engineering Department. Listed below are our benefactors over the past 6 months. These donations are making a difference. Private support can help us to attract outstanding students and promising young faculty. We have used gift dollars to improve research and teaching labs, as well.

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"Meves met his current business partners through NEWPATH and has gained confidence because of the IT centric classes and environment that the program fosters."

"The ultimate goal of all of this is to enable students to be confident and possess skills to become entrepreneurs by the time they graduate. Several NEWPATH students don’t wait until graduation to start their own businesses. They are launching IT startups while they are still in school."
Congratulations to CSE Autumn and Winter Quarter Graduates!

*The Department wishes you the best of luck in your future endeavors.*

**Bachelor's CSE:**
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