



MSU's Yuan receives NSF

CAREER Award



Dr. Changhe Yuan, assistant professor of Computer Science and Engineering at Mississippi State University, has been awarded a CAREER grant from the National Science Foundation.

The title of his award is "CAREER: Explanation, Decision Making, and Learning in Graphical Models." Funded by the Robust Intelligence program in the CISE Division of Information and Intelligent Systems (IIS), Yuan will develop new and improved approaches to explanation, decision making, and learning in graphical models in addressing the limited adaptability and scalability of existing methods. This project will lead to significantly better approaches to reasoning and decision making under uncertainty in any disciplines where graphical models have found successful applications, including biology, medicine, security, planning, education, and many others.

EPSCoR seed grants announced

Mississippi EPSCoR's 2010 Targeted Seed Grant proposals targeted collaborative efforts among faculty at the four research institutions.

Seed Grants are designed to bring new people into the project and to facilitate exploration of new lines of research. Residual funds from year one were available to more than double the amount of seed grant funding available in year two. The EPSCoR RII Steering Committee decided to fund two types of Seed Grants in year two. The first type of seed grant, Targeted Seed Grants, were specifically focused on building collaborations among the research focus groups as recommended by our EPSCoR RII Advisory Boards (State and National) and by the National Science Foundation. The second type of seed grant, Traditional Seed Grants, were used to bring new people into EPSCoR to explore new lines of research and to build collaborations within and among research focus areas. The Digital Lung Project was used as a unifying application for several seed grants of both types.

Robert Doerksen (CompChem), Yixin Chen (CompBio), and Dawn Wilkins (CompBio) of UM, and

Raphael Isokpehi (CompBio) of JSU and Nan Wang (CompBio) of USM in *Combined Computational Chemistry and Computational Biology Modeling for Understanding Protein-Protein and Protein-Ligand Interactions*.

Mariola Edelmann (CompBio), Shane Burgess (CompBio) and Bindu Nanduri (CompBio), from MSU collaborated with Robert Hester (BioSim) from UMMC, Keith Walters (BioSim) from MSU, Nan Wang (CompBio) of USM, and Raphael Isokpehi (CompBio) of JSU in a *Systems Biology Modeling of Lung Cell Response to Nanoparticles*.

Rebecca Toghiani (CompChem new investigator) and Keisha Walters (BioSim) of MSU teamed with Greg Tschumper (CompChem) of UM in *Combined Computational Chemistry and Computational Biology Modeling to Understand Protein Interactions*.

Jian Chen (CompBio new investigator) of USM collaborated with Robert Hester (BioSim) of UMMC, Preetam Ghosh (CompBio) and Joe Zhang (CompBio) of USM, and Bindu Nanduri (CompBio) of MSU on *Visualization Tools for Building*

Biological Models.

John Correia (CompChem new investigator) of UMMC collaborated with Charles McCormick (CompChem) of USM and Randy Wadkins (CompChem) of UM in *Studying the Properties of Nanoparticles for Drug Delivery*.

Dr. Tibor Pechan (CompBio new investigator) and Steve Gwaltney (CompChem) of MSU were awarded a seed grant with the title of *Using Computational Chemistry to Improve Protein Identification for Biological Modeling*.

Twenty seed proposals were received. The Steering Committee conducted an initial screening of the proposals and selected eight to send for external review based on scientific merit and level of integration with ongoing EPSCoR research. The Steering Committee met at MSU for an NSF style panel to review the scores and make the final funding decisions.

The seed grants are targeted for research that builds on the foundation of existing research focus areas and to promote a stronger interdisciplinary research network in Mississippi. Deadline for new awards is June 1, 2011.

CSI: Coming to Mississippi

Middle school science teachers will soon be experiencing CSI: Mississippi during the 2011 professional development summer teacher workshop. The workshop will be held June 6-17, 2011 at the University of Southern Mississippi in Hattiesburg, MS.

Katie Echols, EPSCoR education and outreach coordinator said the workshop will introduce teachers to the use of forensic science as a method of teaching fundamental science skills and concepts. The workshop is focused around the MS science curriculum and will incorporate biology, chemistry, physical science, physics, mathematics, technology, writing, and more. Participants will experience inquiry-based and laboratory instruction and will receive research-based curriculum materials developed through the MS-EPSCoR program, a stipend, and CEUs.



Reinemann recognized

University of Mississippi chemistry major and computational chemistry researcher Nikki Reinemann of Batesville, MS received an Honorable Mention in the 2011 Barry M. Goldwater Scholarship and Excellence in Education Program.

Working in Dr. Nathan Hammer's lab, Reinemann's research is a vibrational spectroscopy study of MIDA esters, which are synthetic substrates used in iterative cross-

EPSCoR State meeting is successful

Stormy spring skies didn't dampen the enthusiasm of more than 100 student researchers and faculty advisors from around the state who attended the Mississippi Experimental Program to Stimulate Competitive Research (EPSCoR) annual meeting April 14-15 at Mississippi State University.

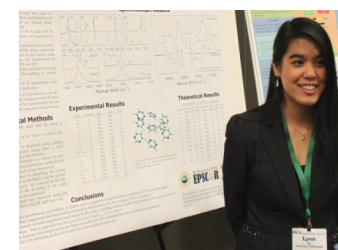
In spite of tornado warnings throughout day two of the conference, participants enjoyed a full agenda of presentations, networking opportunities and special speakers at this year's gathering, according to EPSCoR education and outreach coordinator Katie Echols.

"It was wonderful to be able to showcase the work our



students and faculty are pursuing thanks to EPSCoR programs and funding. The feedback we have received from the meeting has been very encouraging," she said.

In Mississippi, the initiative funded by a National Science Foundation grant identifies, develops and deploys academic science and technology to increase the state's research and development competitiveness and foster economic growth.

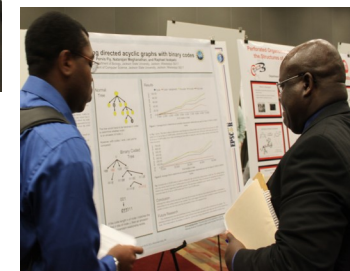


Lynn Joe from UM waits patiently for her poster to be judged.

The program provides a platform for advancing scientific capabilities in the state, and also seeks to identify and enhance capacity needs and give stakeholders the ability

to address those needs. For example, a new, high-speed Internet research ring is one of EPSCoR's goals as it helps the state take advantage of major project funding opportunities.

"Without the new networking backbone and a robust cyber-infrastructure, Mississippi institutions would be crippled in their ability to compete effectively for many NSF programs. They are critical," said NSF EPSCoR Program Director Jennifer M. Schopf, who was on campus to provide an update of the program from a Washington perspective.



Undergraduate student Pervis Fly (l) of JSU explains his Computational Biology project to a judge during competition.

NSF EPSCoR program officer, Dr. Jennifer Schopf (r) visits with Joyee Esters from Millsaps College as she describes the research she is conducting at the University of

coupling reactions. The interest in this study is the boron-nitrogen dative bond stretching frequency in which there has been a great controversy over its assignment in the past 50 years. The experimental and theoretical values of this mode correlate very well, and because of the great stability of this new molecule, it is believed that her research group has found the lowest B-N stretching frequency recorded to date.



Advisory Board members include (l-r) N. Radhakrishnan, David Silvernail, Jerry Hobbs, Lisa Grable, MSU President Mark Keenum, Michael Khonsari, Vincent McKoy, and Carl Hagstrom.

EPSCoR holds Research Day at the Mississippi Capitol

EPSCoR project team personnel along with students from the state's four research institutions hosted the EPSCoR Research Day at the Capitol in Jackson, MS on Wednesday, March 16, 2011.

Beginning with breakfast in the Capitol rotunda for the legislators, lobbyists, media representatives, and others, students displayed their research posters in their respective areas of research.



Kari Copeland of the University of Mississippi talks to Senator Frazier.

The intent of the Research Day was to educate State legislators on the importance of EPSCoR funding in Mississippi and its impact on science, technology, engineering and mathematics throughout the state.

Students participating in Research Day were Gabrielle Cooper from JSU, mentor is Raphael Isokpehi, Department of Biology; Kari Copeland from UM, mentor is Greg Tschumper, Chemistry and Biochemistry; Ying Li, from USM, mentor is Chaoyang (Joe) Zhang, School of Computing; Prashanti Manda from MSU, faculty mentor is Susan Bridges, Computer Science and Engineering; Debra Jo Scardino, from UM, faculty mentor is Nathan Hammer, Chemistry and Bio-

chemistry; Erick Vasquez from MSU, faculty mentor is Keisha Walters, Chemical Engineering.

Students were invited to visit the senate floor and were introduced to the congressional delegation by Senator Hillman T. Frazier of Hinds Co.



(L-R) Nan Wang, Debra Jo Scardino, Kari Copeland, Gabrielle Cooper, Ying Li, Prashanti Manda, and Erick Vasquez.

EPSCoR supports BEST Robotics competition

The Mississippi BEST 2010 Robotics Competition held on the Mississippi State University campus had the largest attendance in the five years since the Bagley College of Engineering began hosting the competition.

Fifteen schools, six sponsors and over 60 volunteers participated in the event where school teams competed with their original-design robots in the themed "lean engineering" competition and titled "Total Recall."

The competition consisted of two areas for success. The robotics performance awards were based solely on the actual performance of the robot in accomplishing the assigned

task. The top four teams in the robotics portion of the competition were Lausanne Collegiate School from Memphis, Tenn.; Holy Cross School from New Orleans, La.; Horn Lake High School from Horn Lake, Miss.; and East Rankin Academy from Pelahatchie, Miss.

The second area of competition tied in a marketing presentation and exhibit, spirit and sportsmanship and technical notebook scores with the robot performance score. The top three teams who placed with the BEST Award were



The intent of the BEST program is to motivate middle and high school students to pursue fields of

Horn Lake High School from Horn Lake, Miss.; Holy Cross School from New Orleans, La.; and Starkville Christian Home Educators from Starkville, Miss.

Winners advance to the South's BEST regional competition held at Auburn University, November 18th-20th at Beard-Eaves Memorial Coliseum. They will compete among the top 60 teams from 13 BEST Hubs in seven states.

study and careers in engineering, science and technology, as well as introduce them to some of the engineering/scientific methods through mentoring by industry professionals and actual hands-on experience. Real-world engineering is demonstrated while providing an exciting and fun sports-like competition.

Sponsors, students, and schools competed in BEST free of cost thanks to the 2010 support from the following industry: Caterpillar, Mississippi EPSCoR, Mississippi Manufacturers Association, Hol-Mac Corporation, Nissan, and Sleep Innovations.



USM students receive NSF Research Fellowships

University of Southern Mississippi (USM), graduate student Brooks Abel



(l) and undergraduate student, Nic Treat (r), were awarded



NSF Research Fellowships recently.

Under the direction of Dr. Charlie McCormick, professor of Polymer Science at USM, their proposals to NSF were based on the McCormick research group platform of synthetic polymeric vehicles for delivery of therapeutics and diagnostics.

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Computational Chemistry

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Computational BioSimulation

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Collaborating with Dr. Randy Wadkins and others at the University of Mississippi, they are using computational chemistry in an attempt to model McCormick's complexes and to predict siRNA release from polymer nanocarriers. Comparisons to USM's experimental data, both *in vitro* and *in vivo* (in conjunction with UAB's Cancer Center) are planned.

Additionally, Dr. John Correia, at the University of Mississippi Medical Center is studying USM's nanocarriers.

Plans are underway to work with Dr. Keisha Walters from Mississippi State University to connect the lung models she and Dr. Keith Walters are working on with real labeled gold nanoparticles to make *in situ*. The object is to actually follow the particles (in conjunction with the MSU College of Veterinary Medicine) in testing animals. Those diagnostic nanoparticles can be fashioned in a similar way to the ones being studied by Dr. Correia.

McCormick's postdoc, DeeDee Smith, along with Chris Brooks, Abel and

Treat presented at the American Chemical Society's (ACS) Gordon Conference and will make additional presentations this year, as well as an invited publication on polymer vectors for cancer cell therapy. Presentations and posters will be presented in Denver, Colorado.

McCormick said, "the good news is that Mississippi research is being recognized and the EPSCoR program gives us a chance to do things otherwise not possible. Actually, I am glad the program officer at ACS is insisting on proof of collaboration."

Brown uses JSU experience at PNNL

In an effort to support the development of the next generation of scientists from minority serving institutions, the National Visualization and Analytics Center (NVAC) is exploring opportunities for involvement with faculty and students at Jackson State University (JSU).

The NVAC is organizing a team that includes representatives from the VACCINE, CCICADA, and FODAVA centers to put on a workshop on visual analytics curriculum (VAC) development at the upcoming VAC Consortium meeting. This workshop is geared toward people who are currently teaching a course in visual analytics or would like to develop a course. Through this workshop, professors

will share lessons learned and best practices from their courses, as well as begin developing common ideas about the content of a visual analytics curriculum.



JSU has been involved in VAC Consortium meetings since 2008, and most recently hosted staff from DHS, NVAC and Pacific Northwest National Laboratory (PNNL) as part of their closing festivities for Bioinformatics Awareness Month at JSU.

PNNL is also working with JSU to develop internships and research opportunities. One early success in this regard is



Shyresha (Shy) Brown, a recent graduate of JSU with a bachelor's degree in biology/pre-medicine. Shy joined PNNL as a research associate on a one-year post-baccalaureate appointment in February 2010. She has a dual assignment as part of two different teams: computational biology and bioinformatics and information analytics. She is applying her education in biology and experience in JSU's Visual Analytics Career Development Program to support multiple programs. These include the National Biodefense Analysis and Countermeasures Center (NBACC) Technology Emergence Detection project and internal research focusing on the application of visual analytics tool for biology.