InCYde MECHANICAL ENGINEERING
IOWA STATE UNIVERSITY
Department of Mechanical Engineering

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Freshman finds success in SPEED


Sechi

Deidre Sechi, freshman in mechanical engineering, spent this past summer involved with the Summer Program for Enhancing Engineering Development (SPEED) program. During her time in the program, Sechi was involved with research on paper-based microfluidic devices under assistant professor and William March Scholar in Mechanical Engineering **Nastaran Hashemi**.

"Dr. Hashemi showed me how I could combine a mechanical engineering degree with the medical field," says Sechi. "I really enjoy being able to innovate an idea to make life better and easier for society. Working with Dr. Hashemi, my project dealt with creating a device that can detect diseases in an affordable and easily portable manner."

At the end of the summer, each student involved in the SPEED program gave a 10-15 minute presentation on their research experience. This was judged based on the participant's professional presentation performance. The presentations were held in 207 Marston hall on Saturday, August 3rd. A total of 21 individuals participated, with 13 total presentations. Deidre Sechi's presentation was titled "A 3D Diagnostic Device Based on Paper-Based Microfluidics". Sechi's presentation received first place.

"This first place award means a lot to me. I get very nervous talking in front of people and this gives me more confidence in my presentational skills," says Sechi. "It is also very rewarding to know that all my hard work was recognized and worth it."

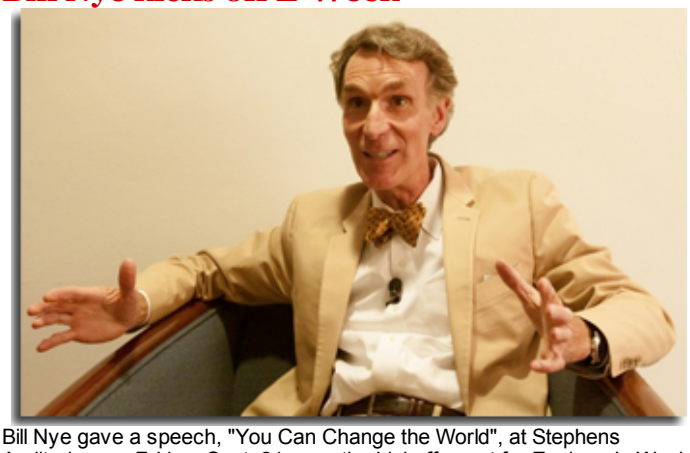
Deidre Sechi will continue her research work with Dr. Hashemi this fall. Sechi credits the SPEED programming with learning how to present a project professionally, as well as college preparation in physics, calculus, and computer programming.

Recent Grant Award Announcements


Attinger

PI: Daniel Attinger, with Adam Donaldson (Dalhousie University), Craig Moore (Niagara Regional Police), and Shih-Fu Chang (Columbia University)
Title: "Development of a Science Base and Open Source Software for Bloodstain Pattern Analysis"
Award Amount: $476,187
Awarding Agency: Office of Justice Programs, United States Department of Justice

Bill Nye kicks off E-Week


Bill Nye gave a speech, "You Can Change the World", at Stephens Auditorium on Friday, Sept. 21, as a the kickoff event for Engineer's Week. Photo by Megan Wolff/Iowa State Daily.

Bill Nye delivered his speech "You Can Change the World" on September 21 for the kickoff event to Engineer's Week 2012. The nature of his talk was how people are contributing both negatively and positively to the environment, how we are using resources and what changes can be made to make the world a better place to live. Nye's presentation of his material was characteristically comic while still educational and very accessible.

Nye predicted society should be able to make some major scientific breakthroughs in the next few decades. "I think you all will be able to cure cancer or most cancers — I think you can do that in the next 25 years," said Nye. "I would like you all to address climate change in a positive way." Nye also discussed the idea of a better transportation system with the key being a "much more sophisticated energy, electricity, especially storage, distribution system for our developed world." Upon concluding his talk, Nye stayed on stage for nearly an additional hour to answer questions from the audience. (Full story)

Iowa State launches wind energy minor

As part of the Wind Energy Initiative, Iowa State University has launched an inter-disciplinary minor designed to prepare its students for a career in one of the most rapidly growing technology sectors, wind energy.

A collaboration among of the university's College of Agriculture and Life Sciences, College of Engineering, and the College of Liberal Arts and Sciences, the 15-credit minor encompasses the wind energy industry's many disciplines—aerodynamics, materials science, mechanics and meteorology, as well as civil and construction, electrical, and industrial engineering.

The minor is available to any student at Iowa State with the necessary math and physics prerequisites. Two core courses, Engr 340X Introduction to Wind Energy: System Design and Delivery, and Aero E 381 Introduction to Wind Energy, are required. The remaining nine credits can be selected from 22 elective courses in engineering and meteorology. (Full story)

Biochar working to fight drought

The team led by Attinger will study the basic physics involved in the impact and drying of blood drops, to develop new tools and methods for crime scene reconstruction. The team involves Prof. Shih-Fu Chang, an expert in pattern recognition, Prof. Donaldson, an expert in open-source computational fluid dynamics, and forensics consultant Craig Moore.

This 2-year award completes the transfer of the research program of Attinger from Columbia to Iowa State University. During that transfer process, Attinger hired a talented team of researchers and started collaborating with the Midwest Forensic Center in Ames. That Center makes Iowa State University an ideal place to conduct research on bloodstain patterns, together with the world-class Virtual Reality Center and the very strong thermofluid program of ISU's College of Engineering. On a personal note, Attinger is curious of applying engineering methods to the socially relevant and psychologically intriguing discipline of crime scene reconstruction.

PI: Terry Meyer
Title: "Planar Liquid-Vapor Imaging of Fuel Sprays for Conventional and Alternative Fuels"
Award Amount: $106,500
Awarding Agency: Air Force Research Laboratory

Meyer

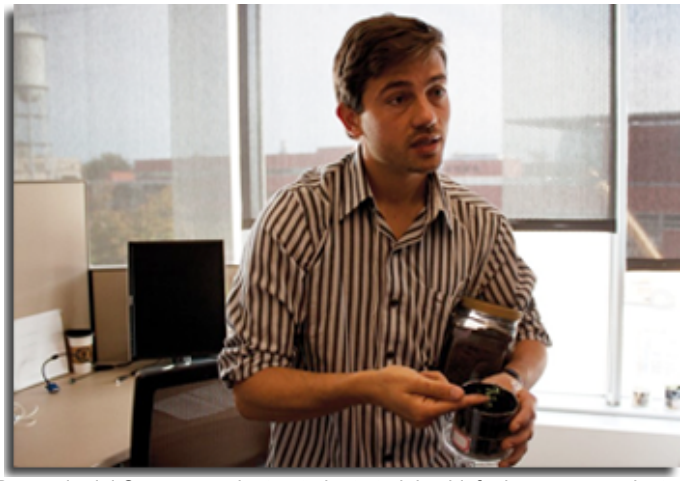
The goal of this research project is to develop an optical technique for separating and quantifying the liquid and vapor phases of fuel sprays, which is critical for optimizing fuel-air mixture preparation in novel combustors utilizing alternative fuels. The project seeks to overcome challenges associated with the complex laser-matter interactions due to the presence of multiple phases, the wide range of length scales, and the effects of temperature and pressure. Meyer hopes that the knowledge gained in the project will assist engine manufacturers in improving the combustion efficiency and reducing pollutant emissions for advanced fuels and propulsion systems.

Starns receives outstanding faculty award

Gloria Starns, senior lecturer in mechanical engineering, received an outstanding faculty award from Kappa Alpha Theta, an academic fraternity for women. Starns was nominated for Kappa Alpha Theta Fraternity's Ten Outstanding Faculty Members by members of the Gamma Pi chapter of Kappa Alpha Theta on the ISU campus. 124 applications were received from chapters across the United States and Canada.

Starns

"One of the criteria for this award was having been involved with several members of Kappa Alpha Theta," explains **Martese Hoffman**, senior in mechanical engineering and Chief Administrative Officer of the Gamma Pi chapter. "She has



Bernardo del Campo, graduate student studying biofuels, arranges plants growing in "biochar" in the Biorenewables Research Lab. Photo by Lyn Bryant/Iowa State Daily.

While no meteorologist or agronomist can accurately predict which years will be "dry years," scientists and farmers can now take steps to protect themselves against plant dehydration during a drought. Biochar, a substance known for its ability to retain water and enrich soil fertility, is on the mind of researchers at Iowa State.

Created from a process called pyrolysis, biochar exhibits many unique properties that could provide aid to combat future dry spells, the most noteworthy being water retention. In a lab study conducted at Iowa State, researchers discovered biochar increased the soil's water retention by 15 percent.

Bernardo del Campo, graduate research assistant in mechanical engineering, said specific types of biochar fit well with specific soils. The type of feedstock, process conditions and peak temperatures the material is exposed to during pyrolysis influences the biochar's properties and qualities.

"It's going to be more like a soil amendment," del Campo said. "That amendment should balance or complement some properties of the soil. The best biochar will match with your soil." (Full story)

Dedic featured in *Daily* article

Chloe Dedic, graduate student in mechanical engineering, was featured in the *Iowa State Daily* on September 17. Dedic discusses her involvement in the First Year Honors Mentor Program, and her research work with **Terry Meyer**, associate professor of mechanical engineering.

Dedic

Dedic has been working with Meyer since she was paired with him four years ago. In her junior year as an undergraduate, Dedic became one of the 2011 Goldwater Scholars, a prestigious scholarship given to students who show intent to further their studies in the natural sciences, mathematics and engineering fields.

Dedic has also been involved in several extra-curricular activities. As an undergraduate she was involved in band, Engineers Without Boarders and the water polo club. Now, as a graduate student, she is involved in Mechanical Engineering Graduate Student Organization. She also coordinates the learning communities for the first-year graduate students. (Full story)

Upcoming Events

October 3 – Is capitalism the key to global sustainability?
October 5-7 – Deming Conference
October 9 – Promoting just trade alternatives in the global

mentored and taught quite a few of us who had been through the program. She always takes time to help us on our homework and never thinks twice when we ask her to look over a resume or write a recommendation. She is someone that I aspire to be: a wonderful professor, mentor, and a friend."

Starns says the award is especially meaningful because it is a student initiated award. "I was fortunate to have had the opportunity to advise and teach engineering students from the time I began working on my graduate degrees at Iowa State," says Starns. "My favorite things about teaching mechanical engineering are those things that are foundational for a top notch program like Iowa State's: a supremely competent and engaged faculty and supremely competent and engaged student body. It has been my experience that the overwhelming majority of students are eager to learn and that they are willing to work hard to achieve difficult goals. My role in that process is to ensure that students have the opportunity to learn and use their newly acquired skills and knowledge to set and achieve problem solving goals that were not possible prior to their experience in my classes."

economy
October 12 – Open listening session to review the central services research enterprise
October 12 - VRAC Tour

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Do you have department news you'd like to share?
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