

# Mechanical & Industrial Engineering

UNIVERSITY OF IOWA

*"In today's world, engineers must creatively solve problems in a global collaborative environment."*

*-Alumnus Robert E. Moulds (BS 1970) regarding VIPT*

July 2016

## Content

- Virtual International Project Team (VIPT)
- New Faculty
- Featured Student Organization
- Student Spotlight
- Awards and Achievements

## Important Dates

- Fall Advisory Board Meeting: Friday, September 30<sup>th</sup>
- Homecoming Weekend: Friday, September 30<sup>th</sup>- Saturday, October 1<sup>st</sup>
- Fall 2016 Senior Design Night: Thursday, December 8<sup>th</sup>
- Spring 2017 Senior Design Night: Thursday, May 4<sup>th</sup>
- Spring Advisory Board Meeting: Friday, May 5<sup>th</sup>



## Message from the DEO

Congratulations to all for the many wonderful achievements in the Department of Mechanical and Industrial Engineering (MIE). First, we successfully recruited two new faculty members in Industrial Engineering and two new faculty in Mechanical Engineering. A search for a lecturer in manufacturing and design is underway. Two faculty were promoted to the rank of Professor and a lecturer to the rank of Senior Lecturer. Professor K.K. Choi was elected a Fellow of the Society of Automotive Engineers (SAE) and a Fellow of the American Institute of Aeronautics and Astronautics (AIAA). Professor H.S. Udaykumar won the College of Engineering Excellence Award for Research. PhD candidate Mohsen Ghamari received the University of Iowa Outstanding Teaching Assistant Award. Our undergraduate students Abbey Hunt, Alan Callender, and Victoria Trojanowski, were recognized for outstanding leadership. The MIE capstone senior design courses underwent major changes in funding mechanisms and partnerships. Many may recall room 1307 as the "TA room." This room is being converted into a design lab for students to brainstorm ideas and design products. Social media continues to grow and enhance community building and outreach. Finally, several new initiatives were proposed that include creating a Lean/Six Sigma certification program, a proposal for UI: Create from Maker hub to Maker net, and enhancing the Industrial Engineering & Management Sciences graduate programs.

I look forward to what the next year will bring for our department.

Thank you,  
Ching-Long Lin, Departmental Executive Officer

## Virtual International Project Team (VIPT)



Over recent years, engineering has become a global profession. Many companies rely heavily on international collaboration in design, manufacturing, and marketing of products. Firms involved in the delivery of engineering services (e.g., engineering consulting) are becoming more involved in international activities. It is clear that engineering students throughout the world must develop special skills to adapt quickly and become effective professionals in an international community. Equally important, they must be knowledgeable and respectful of cultural differences as an effective member of an international team. The College of Engineering at the University of Iowa (UI) has been a partner with the Universite Provence (UP) in Marseille, France developing an international project experiences for undergraduate engineering students called the Virtual International Project Team (VIPT), taught by Daniel Mineck. The VIPT program involves substantial interaction between the students on collaborative projects throughout two semesters. Regular communication on the Internet (i.e., email, video-conferencing, shared web site, data transmission), combined with travel to the partner institution, provides a realistic and interactive level of partnership on a common project.

[For more information on Robert E. Moulds](#)



In addition to addressing technical requirements, participants also learn about the culture, economy, and educational systems of their international partners. UI students travel to France in May to participate in a one-week exchange component interacting with their UP counterparts and tour French companies. Airfare to UP is provided to the College of Engineering from generous corporate and alumni donations, such as alumnus Robert Moulds (BS 1970 in Mechanical Engineering). The UP students visit the UI in February (their semester break) to participate in a one-week exchange component with their UI team members. The College of Engineering is in the process of establishing other relationships for VIPT. Dan Mineck on the future of VIPT: "We're not sure what continent we will be partnered with in the future (it's an adventure!) but the College is dedicated to the idea of VIPT and we expect it will be part of the curriculum for many years to come."



Top: 2014 student visiting a steel mill  
Bottom: 2014 students enjoying dinner at host family home in France

### Goals of VIPT:

1. Provide undergraduate engineering students a team-based project experience
2. Gain an understanding and appreciation of engineering standards, common engineering practices, and cultures in other countries
3. Develop cross-cultural communication necessary to work on a team with students from another country on a common project
4. Understand and master the difficulties of communicating clearly and concisely through electronic media with engineers for whom English is a second language.

## New Faculty



### Stephen Baek

Assistant Professor in Industrial Engineering

New to the Industrial Engineering faculty is Stephen (Seungyeob) Baek. Baek focuses his research on 3D modeling and analysis technologies, where he hopes to mathematically understand how shapes are formed and how things are designed in order to develop smarter design tools. He received his PhD in Mechanical and Aerospace Engineering from Seoul National University where his research focused on nonlinear statistical analysis of human body shapes for computer-aided design.

Baek began his research by working with online retailers to create a 3D human model that customers could interact with while searching for their products. Baek foresees that computer-aided design and manufacturing technology will be available in the near future. *"3D technology is evolving extremely fast these days, and this is headed toward the decentralization of the design and manufacturing technology. Even nowadays, people can scan things in 3D with a smartphone, create CAD models with a few clicks on a web browser, and fabricate them easily with a 3D printer."* Baek believes this will change the entire paradigm and process of innovation. *"In the future, if there is a creative idea, anyone will be able to begin a project through design and manufacturing tools at the tip of their fingers---as people do with PCs, Internet, and smartphones. This is a really exciting thing and will create enormous new possibilities. My commitment is to support this revolutionary change by developing analysis technologies and software here at the university."* Baek has been working on theories and applications for leveraging the recent evolution of 3D technology. One of such efforts is geometry big data analytic research specializing in computer-aided design and manufacturing. In his Innovative Design and Art (IDEA) laboratory, Baek and his students have been working on developing methods for collecting, describing, and analyzing a large amount of design and manufacturing data.

Eventually, he hopes to compile these methods into an intelligent software system to assist creative design and manufacturing process to enable users to pursue innovation without being hindered by technological barriers.



Samuel Mate- Mechanical Engineering MS candidate adjusts equipment used in generating 3D models and software creation

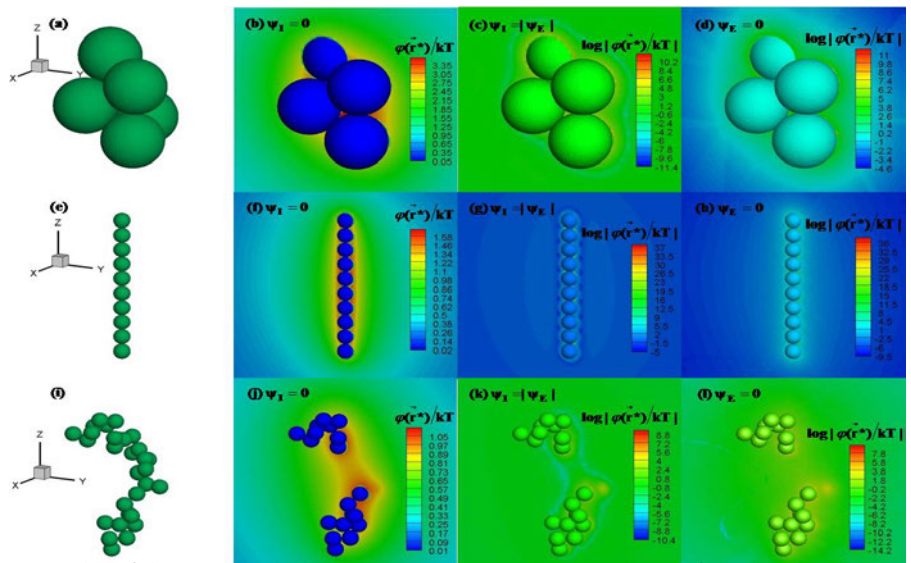


## Ranganathan Gopalakrishnan

Lecturer in Mechanical Engineering

New to the Mechanical Engineering faculty is Ranganathan Gopalakrishnan (Ranga), who is particularly interested in aerosols. Before finding his home at the University of Iowa he studied at the University of Minnesota, University of California Berkeley and the California Institute of Technology. He received his PhD from the University of Minnesota where he did extensive research on the diffusion of particles in the air, specifically how particles that are not spherical move and change in size. His goal is to perfect the use of these small particles in electric circuits because it is important to figure out what order of placement

works best for building high speed circuits. Even though the research is complex, he hopes to make significant progress in the next 5-10 years. Arranging particles in the most efficient order along an electrical circuit has several applications, including faster more compact cell phones and explosive detection devices that would really innovate the way we live today.



Contour plots of electric potential calculated around arbitrary shaped particles used for building novel nanomaterials



## Ruben Beltran del Rio

Lecturer in Industrial Engineering

Also new to the Industrial Engineering faculty is Ruben Beltran del Rio. He was born in Chihuahua, Mexico. He obtained his PhD in Industrial Engineering from Kansas State University. His areas of academic interest are quality control, statistical process improvement, six sigma and supply chain management. Before coming to Iowa, for the last 25 years, he was teaching at Tecnologico de Monterrey, the largest, most prestigious private university in Mexico. He has been a visiting professor at several universities worldwide, including University of Tampere (Finland), Universidad del Caribe (Colombia) and Krakow Technical

Institute (Poland). He co-authored two books on topics related to quality values and regional economic development. For several years, Beltran del Rio worked for manufacturing companies like Packard Electric, United Technologies, Furukawa Electric Co. and RCA. He has devoted much of his time to help develop a quality culture in society that values continuous improvement, leadership, and service to others.

# Featured Student Organization

## Institute of Industrial and Systems Engineers (IISE)



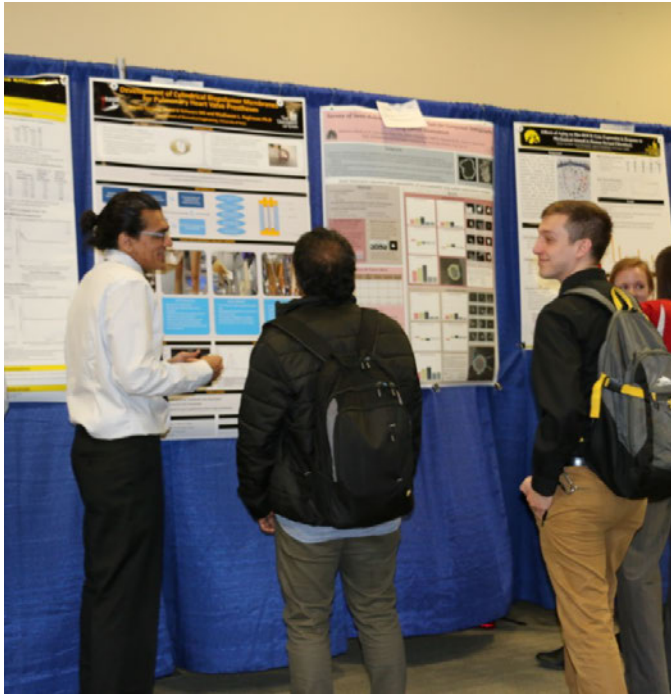
The University of Iowa Institute of Industrial Engineers (IIE), now known as the Institute of Industrial and Systems Engineers (IISE), traveled to the University of Illinois at Urbana-Champaign for the annual North Central Region IISE Conference from February 25<sup>th</sup> to 27<sup>th</sup> of this year. During the conference, members were able to network with several companies, attend workshops put on by leaders in their field, and get to know IISE members from other North Central Region schools. IISE has monthly meetings, several professional development and social events, and factory tours at places such as General Mills and Raining Rose each semester. IISE has 40 members and is open to all engineering students. The current leadership includes Abbey Hunt (President), Audrey Hemesath (Vice President), Annabel Seeling (Secretary), Jessica Schmeiser (Treasurer), Mandy Gavin (Chapter Development Director), Jacob Anderson (Communications Director), and Ileen Aberman (Executive Board Director).

For more information or for questions regarding membership, contact:

[iie-engineering@uiowa.edu](mailto:iie-engineering@uiowa.edu)

# Student Spotlight

## Spring Research Open House



MIE student projects at the Spring 2016 Research Open House April 7th

The UI College of Engineering's 14<sup>th</sup> Annual Research Open House on Thursday, April 7<sup>th</sup>, showcased, celebrated, and promoted the research activities and accomplishments of the College of Engineering's students, faculty, and staff. The event also provided opportunities for graduate and undergraduate recruitment, development of new professional contacts, and informing the University and local community about the ongoing projects and research capabilities of Engineering students.

[For a list of poster winners click here](#)

## Awards and Recognition

The College of Engineering's departments, centers and programs recognized outstanding students and researchers by presenting annual awards. The recognition and awards were presented during a luncheon following the research open house on April 7<sup>th</sup>. MIE student organization Presidents received recognition.



From left: Abbey Hunt-President of IISE, Alan Callender-President of SAE Baja, Victoria Trojanowski- President of AIAA

## Awards and Achievements

### Undergraduate Awards:

- Industrial Engineering Outstanding Senior Award: Abbey Hunt
- Mechanical Engineering Undergraduate Research Award: Alan Callender
- Mechanical Engineering Undergraduate Leadership Award: Victoria Trojanowski

### Mechanical Engineering Graduate Awards:

- The Sharada Devi Planjery Memorial Award, Venkatachalam Planjery Memorial Scholarship, and Rajyalakshmi & Shankar N Planjery Scholarship: PhD candidate Thomas J Williams (Advisor- Christoph Beckermann), PhD candidate Huaxia Li (Advisor- Hiroyuki Sugiyama), PhD candidate Guiyan Zang (Advisor- Albert Ratner)
- Richard B. Stewart Mechanical Engineering Thermal Fluids: PhD candidate Silvia Volpi (Advisor- Fred Stern), PhD candidate Timur Dogan (Advisor- Fred Stern)



Left to right: Huaxia Li, Alan Callender, Victoria Trojanowski, Ching-Long Lin, Silvia Volpi, Timur Dogan

See more photos from the Spring 2016 Research Open House here: [Flickr](#)





## Outstanding Teaching Assistant Award

Mechanical Engineering, PhD candidate, Mohsen Ghamari, was selected as a recipient of an Outstanding Teaching Assistant Award. The University formally recognized Ghamari's philosophy of teaching and learning. Demonstrated by his classroom evaluations, and the strong support he garnered from students and faculty. All of which made his nomination stand out from the other candidates and clearly demonstrated his excellence in teaching.

## Faculty Honored as Fellow

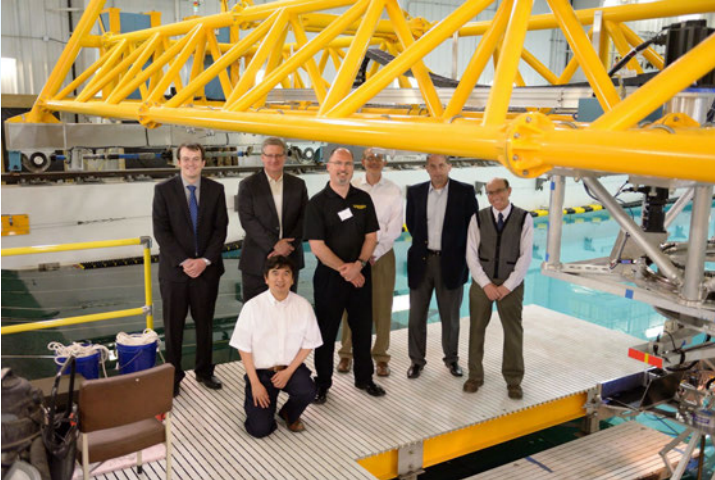
Mechanical Engineering Professor KK Choi was elected as a fellow of the Society of Automobile Engineers (SAE) for his exceptional accomplishments and contributions to the mobility industry and as a fellow of the American Institute of Aeronautics and Astronautics (AIAA) for his notable contributions to the community of the arts, sciences and technology of aeronautics and astronautics.



## Faculty Excellence Award for Research

Dean Alec Scranton presented H.S. Udaykumar, Professor of Mechanical Engineering, with the 2016 Faculty Excellence Award for Research. His research is supported by federal agencies and covers a broad spectrum of physics that includes heart valves, how objects move when thrown by blast waves, and how projectiles penetrate into metal targets.





Left to right: Alan Callender, Ching-Long Lin, Jim Cahill, Geoff Ward, Lance Wilshusen, Bob Stahlin, Fred Stern: on Advisory Board tour of the Hydraulics Wave Basin Facility



Design for manufacturing (Spring 2016) water pump contest held outside of the main library

## The University of Iowa

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Iowa City, Iowa 52240

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# YEAR ROUND

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