

OKLAHOMA STATE UNIVERSITY
SCHOOL OF INDUSTRIAL ENGINEERING AND MANAGEMENT

COWBOY CONNECTIONS

SPRING 2018



College of
Engineering, Architecture, and Technology



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Dr. Baski Balasundaram

Graduate Program
Director



Dr. Sunderesh S. Heragu

School Head,
Regents Professor, and
Humphreys Chair



Dr. Terry Collins

Undergraduate Program
Director



A MESSAGE FROM THE SCHOOL HEAD

Greetings!

We are about to graduate our largest undergraduate class ever, with thirty-one students walking across the stage to receive their BS degrees. This is more than the average number of graduates IEM has produced in recent years! We also have thirty-eight MS students, and two PhD students. Our undergraduate enrollment is hovering around 200 (compared to 125 in recent years) and we are well on our way towards our goal of 240 undergraduate students.

In Fall 2018, we expect a class of thirty-five IEM freshmen. Until recently, we had one or two students joining IEM in their freshmen year. Not only are our numbers going up, but so is the quality of our students. We interviewed fifteen CEAT scholars and sent offers to the top eleven. IEM's Industrial Advisory Board members have reached out to these students encouraging them to attend IEM at OSU and receive a degree from one of the top departments around and one that is the third oldest in the world.

We are pleased to report that our rankings continue to grow. According to US News and World Report, IEM is ranked #24 among graduate programs in public universities in industrial/manufacturing/systems. Our goal is to be a top 20 program by 2020 and we are confident we will hit that mark. The reason that our ranking is higher is due to the accomplishments of our students, faculty, and alumni. You will read about some of these in the succeeding pages, but let me highlight a few.

- Bailey Whitman submitted a paper for the South Central IISE student paper competition and placed first. She will now be competing with the first-place winners from twelve other regions from around the world at the annual IISE conference in Orlando on May 21st (page 23).
- Wendy Lau Wong was one of fourteen recipients of the Outstanding Senior award across the entire university (see page 23).
- A team of graduate IEM students placed second in the Logistics and Supply Chain Division's Student Case Competition and will be recognized at the annual IISE conference as well (page 23).
- IEM faculty have been busy writing papers and winning grants. Note the quality and quantity of journal publications by IEM faculty on page 29 and the source as well as amounts of funding on page 28.
- An IEM alumnus, Dr. Lee Blank, will be recognized with IISE's highest award, the Frank and Lillian Gilbreth award at the annual IISE conference.
- Two of our recent alumni – Dr. Prahalad Rao, currently at the University of Nebraska-Lincoln, and Dr. Hui Yang at Pennsylvania State University – have won the coveted CAREER awards from NSF.
- Mr. Jack Goertz, a member of IEM's advisory board and the Cowboy Academy, was inducted into the CEAT Hall of Fame; another alumnus, Dr. Eric Woodroof, was also inducted and received the Lohmann medal. A recent alumnus, Devin Hedgepeth, gave a Ted talk at his company. See this [youtube video](#) to view his inspiring talk.

The above is just a very small subset of all the great things happening in IEM at OSU. Another exciting thing happening in IEM is the renovation of the third floor of Engineering North. As described on page 34, the 3rd floor construction will include the demolition of all interior walls, and in a year, we will move back into a modern space. Alumni and friends will have multiple opportunities to name classrooms, offices, and student areas in honor of your professors.

There are many exciting things happening in IEM -- more than can be described in one or two pages of a newsletter. We are therefore sending small pieces of information periodically through social media. Please watch out for them and share amongst your friends.

Go Pokes!

Sunderesh S. Heragu

Regents Professor, Head, and Humphreys Chair

IEM MISSION, VISION & GOALS

Vision

IEM's vision is to place industrial engineers in a wide variety of industries including manufacturing, service, energy, healthcare, humanitarian and others, so that our society at large can benefit from systems that effectively use an optimal set of resources, efficiently produce goods or provide services and enrich the quality of life for all.

Mission

IEM's mission is to develop a diverse group of professionals and leaders in industrial engineering and management by being a leader in education, research, and outreach.

Educational Goals

IEM's educational goals are to educate and produce a new generation of diverse students who are proficient in theoretical, applied, and technology relevant concepts and practices that will have a global reach and global impact. IEM will continue to monitor and enhance the student recruiting, learning, retention, advising, mentoring, internship, and placement processes.

Research Goal

IEM's research goals are to engage in cutting edge research of global importance and to produce innovators as well as next generation engineering, education, and societal leaders.

Outreach Goals

IEM's outreach goals are to actively engage in community projects, economic development, and service for the greater good. The outreach goals also include enhancement of IEM's image within CEAT and OSU and the world at large.

GIVING OPPORTUNITIES

The School of Industrial Engineering and Management looks to alumni and friends, like you, who make the next steps in our innovative future possible. We appreciate every donation, big or small, that supports our school. However, we have listed below several priorities for you to make the most impact.

Space on a donor wall in refurbished IEM space | \$1,000
- IEM spaces will be fully renovated by 2019

Study Abroad Scholarship | \$2,000 per student
- Up to twelve students can receive the scholarship

Annual contribution to two IEM billboards | \$15,000 per year

Sponsorship of IEM networking events | \$25,000

Annual sponsorship of student travel | \$40,000
- IISE conferences, INFORMS conferences, commencement lunches, IAB-student luncheons and IEM reception at annual IISE meeting

Annual sponsorship of the weekly seminar series with a naming opportunity | \$75,000

Endowing a professorship | \$500,000

Endowing a chaired professorship | \$1,000,000

Naming and endowing opportunity of IEM | \$20,000,000

If you wish to donate, please send a check payable to the "Industrial Engineering and Management Excellence Fund" at Oklahoma State University, 322 Engineering North, Stillwater, OK 74078 or make a gift online (click the GIVE button at iem.okstate.edu).

For more information please contact

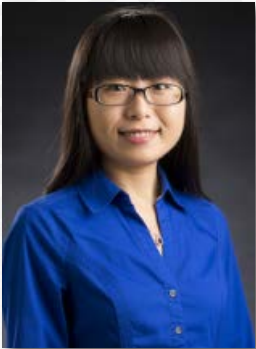
Bryce Killingsworth – Associate Development Director

Office: 405-385-5623

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Email: bkillingsworth@osugiving.com

FACULTY & STAFF SPOTLIGHT



Dr. Chaoyue Zhao

Assistant Professor,
Jim and Lynne Williams Assistant Professor

Dr. Chaoyue Zhao is currently the Jim and Lynne Williams Assistant Professor in Industrial Engineering and Management at Oklahoma State University. She received her BS degree in the School of Mathematics from Fudan University, China in 2010, and her PhD degree in Industrial and Systems Engineering from the University of Florida in 2014. She worked at Pacific Gas and Electric Company in 2013. Her research interests include data-driven stochastic optimization with their applications in power grid planning, scheduling and resilience. Her work has been supported by the National Science Foundation, Department of Transportation UTC, Oklahoma Emergency Management, and Argonne National Laboratory.

*“Whether you think you can, or think you can’t, you are right.”
-Henry Ford*

Michael Hall

IEM Student Worker

Michael Hall is an OSU graduate who earned his BA in History in Spring 2017. Michael was raised in Drumright, OK and relocated to Stillwater for school and work. He has been with IEM as a student worker since August 2016 and will be leaving his position in May 2018, to attend graduate school at Brandeis University where he will be studying Classics. Michael has learned many valuable skills along the way, and his time in IEM has enabled him to grow both as an individual and as a student. Although his time at IEM has been short, the friends and experiences will last a lifetime.



“All we have to decide is what to do with the time that is given to us.”

-Gandalf the Grey

STUDENT SPOTLIGHT

Stephen Cochran Undergraduate student

Stephen's time at OSU has been an incredible growth experience. He transferred to OSU after one year at Drake University in Iowa. At OSU he has been heavily involved with FIJI, his fraternity on campus. He served for a year as President, and a few periods as its Risk Manager. Stephen has also held positions within the campus homecoming steering committee; one example of his responsibilities is when he was in charge of measuring the big house decorations that the fraternity and sorority groups constructed for walk around. Stephen also helped find the judges who scored the decorations. He was even lucky enough to have Dr. Glenn of IEM department serve as a judge! Different mentors of the IEM department have helped him outside of class as well. He was fortunate to gain work experience from internships with both Walmart and Phillips 66 because of that mentorship. In his own words "OSU engineering has prepared me for the future". After finishing his degree, Stephen will work for Webco Steel Industries as a Manufacturing Engineer and complete a Masters program in environmental science at OSU Tulsa. He passed the FE exam in February and is excited to see what the future holds!



"Blessed is the man who finds wisdom, the man who gains understanding, for she is more profitable than silver and yields better returns than gold"

-Proverbs 3: 13-14.



Suzann Watson Master's student

Suzann Watson is a 2014 graduate from the United States Air Force Academy in Colorado Springs, Colorado. She graduated with a degree in Operations Research and currently works as a Personnel Officer in the Air Force. Since graduating she has had assignments at Grand Forks Air Force Base, North Dakota and Langley Air Force Base in southern Virginia. She currently works as the Executive Officer for the Personnel Division Chief for Headquarters Air Combat Command (ACC) which oversees military and civilian personnel, career development and training for over 80,000 members. She is married to Nicolas Watson, a 2013 Air Force Academy graduate, and a logistics officer in the Air Force. Together they have two kids, Luke (5) and Erin (2). She enjoys running/working out, travelling and cooking in her free time. She hopes to transition from the military in summer of 2019 after graduating with her master's degree.

"Nothing in this world can take the place of persistence. Talent will not; nothing is more common than unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent."

- Calvin Coolidge

STUDENT SPOTLIGHT

Gabby Madkins

Master's ETM distance education student



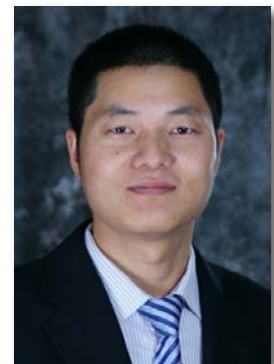
Gabby Madkins is currently acting as a Supervisor over Recruiting and Training/ Workforce Development for the 76th Software Maintenance Group at Tinker Air Force Base. Though Sooner born, with an undergraduate degree in Electrical Engineering from OU in 2013, she is extremely happy to have decided to become a Cowboy to obtain her MS in Engineering and Technology Management Program (MSETM) at OSU. Gabby has a passion for helping others and believes that you get out of life what you put into it. More recently Gabby is enjoying "learning how to be a Mom" to her 18 month old son, Jaxon, who definitely keeps her on her toes! In her free time, she enjoys cooking and spending time with her family, as well as taking naps and trying out new restaurants. She can't wait to see what the future holds for her and her family, and looks forward to new opportunities after graduation.

*"Life isn't about waiting for the storm to pass,
it's about learning how to dance in the rain."*

Yajun Lu

Doctoral Student

Yajun joined IEM to pursue his Ph.D degree in August, 2014. He received his Bachelor's degree from Zhongyuan University of Technology, China in 2008 and Master's degree at University of Huazhong University of Science and Technology, China in 2011, both in Industrial Engineering program. Since March 2011, he had worked as an Industrial Engineer for 3.5 years in Huawei Technologies Co., Ltd., China. The work experience opened a door for him to get a sense of how IE works in the industry and he really enjoyed it. Yajun tries to participate in different extracurricular activities during his free time and get to know people. He once served as Secretary in Alpha Phi Mu and Vice President of the INFORMS OSU chapter. Currently he is serving as Vice President of Education for the Stillwater Toastmasters Club, which is committed to helping people improve public speaking and leadership skills. He loves playing basket ball, fishing, listening to music, and travelling.



*"Failing to plan is planning to fail."
-Alan Lakein*



Q & A With IEM Alumnus Bill Dueease

Tell us a little bit about yourself:

I graduated with a Master's in IEM from OSU in 1968 after attaining my BS in IE from the University of Alabama. Because of my OSU IEM degree and experiences, I was accepted into the only job I wanted, to work for Phillips Petroleum Company in their Supply & Distribution Department. Phillips provided me a PhD. in petroleum trading and distribution so that I was hired away five years later in 1975 by Lajet, Inc. a start up refining company into my next dream job as the VP in charge of all purchases, sales, trading, and distribution. I built this company into a major player in the oil business, while generating over \$160 million in pre tax profits in only five years. I started my own oil trading company in 1980, Aspen Energy Inc., and had fun and made very good money for many years. In 1981, I co-founded with a sheep farmer, the Cardrona Ski area in New Zealand. We converted a sheep grazing mountain into the most successful, most popular, and most respected ski area in New Zealand and Australia, combined. All of this was done in only five years on a shoestring budget to boot. I founded the Office Outfitters in 1993 to create a new supply chain to deliver office products faster, more effectively and at such low cost that we were besting the big box Office Products Companies so easily. They bought me out in 1995. Amazon and Wal-Mart appear to be adopting this model for their use. I founded The Coach Connection, LLC in 2001 where we have partnered with many thousands of our selected clients to build their most enjoyable, thriving, and fulfilling lives.

How has your IEM degree helped you?

My OSU IEM degree helped me more than I realized at the time I graduated. My OSU experience provided me an exceptional foundation and motivation to run and develop some different companies with great successes using distribution and supply as the key.

What aspects of your OSU affiliation while you were a student stand out?

Wilson Bentley, the OSU IEM School Head, Lynn Bussey a co-Master's student, who later attained his PhD in IEM at OSU, and Dr. Ferguson an IEM Professor, all personally affected my life in very positive ways. Wilson Bentley gave me a chance to earn my way into his excellent IEM Master's program and influenced my life with his integrity and education about the real world. Lynn Bussey coached me to discover my true talents and passions and to create and obtain my perfectly designed careers around me to find and live my calling from the very start. Dr. Ferguson educated me about the fantastic opportunities waiting to use my IEM education to make a difference in the world.

What has motivated you to stay engaged with OSU, years after graduation?

I have a strong desire to return the many powerful life gifts I received while at IEM and hopefully share these gifts with students and graduates of IEM. I have had the honor of being inducted into the OSU IEM Cowboy Academy (TCA). The TCA is a newly formed elite group of very successful OSU IEM graduates who have attained remarkable career and life achievements. The TCA is the brainchild of OSU IEM School Head Sunderesh Heragu. I have been further honored to have been elected the first President of the TCA to lead this remarkable group of outstanding very motivated OSU IEM graduates to use our efforts, experiences, knowledge, connections and financial resources to fulfill our Vision for OSU IEM graduates to achieve their most valued and rewarding careers.

"You can't grow yourself unless you know yourself"

-John Maxwell

ALUMNI SPOTLIGHT

Lee C. Raney



Lee C. Raney served the Army in Italy (1946-1948) and Korea as a Communications Officer (1953). He received a B.S. in Industrial Engineering and Management from Oklahoma State University in 1952 and an M.S. in Industrial Engineering from the University of Missouri in 1960. He has served on the faculty as an Instructor and Assistant Professor of I.E. at the University of Missouri and co-founded the department with Dr. Robert Eastman.

As Chief Industrial Engineer, he organized and managed the Industrial Engineering function for Northern Natural Gas Co from 1960 to 1964, and served as President of AIIE Chapter of Omaha, Nebraska. He was appointed Manager of Data Processing Business Systems for Sunray D-X, Tulsa in 1964. Raney also served on the Information Systems merger team that consolidated data processing operations for all Sunray D-X and Sunoco locations.

Raney was Vice-President of MIS for Amerada Hess Corporation, New Jersey/New York (1970-1981). He was also chairman of the team responsible for consolidating the information systems of Amerada and Hess Oil Companies, and managed the implementation of all recommendations and resulting daily operations.

He established Raney Associates in 1981, a firm that provided MIS and Industrial Engineering services to major petroleum corporations and related manufacturing companies. Projects included consolidating, relocating, and simplifying, administrative and manufacturing systems and businesses. The firm also developed retail, legal, and banking software products for personal computers.

Raney was the founder of the Tulsa Air and Space Museum and chairman of the Board from 1993-2002. He provided leadership in developing the vision and mission, determining feasibility, and obtaining the required funding to build a \$6,000,000 facility. He coordinated the architectural, engineering, and construction services to provide a high technology museum and planetarium facility for Tulsa with the purpose of encouraging young people to pursue engineering, science and high technology careers and is currently a Member of the Board Directors and Executive Committee. He received Volunteer of the Year Award for outstanding volunteer service to the people of Tulsa in April 2002.

His current interests include flying, fly fishing, golf, American military history, and Bible study. He obtained a pilot's license with instrument rating, and was a registered Professional Engineer in Missouri and Nebraska between 1960 and 2003. He has conducted numerous Quality Management and Industrial Statistics courses at numerous schools and businesses in Oklahoma, Nebraska, and Arkansas until 1993. In 2008, the University of Missouri inducted Raney into the IMSE Hall of Fame. Most recently he was the recipient of the University of Missouri Distinguished Service in Engineering Honor Award in 2011.

Fall 2017

Aug. 23: *Additive Manufacturing for Surface Materials*, Dr. Hitesh Vora, Oklahoma State University

Aug. 30: *Sequential Bilevel Linear Programming with Incomplete Information and Learning*, Dr. Juan Borrero, Oklahoma State University

Sep. 13: *Reducing Simulation Model Risk Via Input Model Averaging*, Dr. Barry Nelson, Northwestern University

Sep. 20: *CitiBike: Planning through a Combination of Continuous, Discrete, and Simulation Optimization*, Dr. Shane Henderson, Cornell University

Sep. 27: *Decentralized Stochastic Gradient Descent*, Dr. George Lan, Georgia Institute of Technology

Oct. 11: *School Bus Routing with Stochastic Demand and Duration Constraints*, Dr. Rajan Batta, University at Buffalo

Nov. 15: *The Complexity of Adaptive Sampling Line Search and Trust Region Algorithms for Stochastic Optimization*, Dr. Raghu Pasupathy, Purdue University

Nov. 29: *Multi-objective Location Modeling and Genetic Algorithms*, Dr. Mark Daskin, University of Michigan

Spring 2018

Feb. 21: *Stochastic Graph Covering and Modules*, Dr. Simge Küçükyavuz, University of Washington

Feb. 28: *Characterizing the Worst-Case Performance of Algorithms for Nonconvex Optimization*, Dr. Frank E. Curtis, Lehigh University

April 11: *Patchwork Kriging for Large Datasets*, Dr. Chiwoo Park, Florida State University

April 18: *Obtaining Deterministic Rates of Convergence via Smoothing and Acceleration in Variable Sample-Size Stochastic Approximation Schemes for Stochastic Convex Optimization and Stochastic Nash games*, Dr. Uday V. Shanbhag, Pennsylvania State University

Letter from the IAB

Greetings OSU IEM Enthusiasts,

An Oklahoma State Spring is definitely in the air in Stillwater with an “Arctic” Easter, big news for the Cowboy Baseball program, and one of the largest graduating classes from OSU IEM in years! It has been so very exciting to watch the program expand and improve their rankings over the past six years. In February, the IAB had the pleasure of once again visiting with Dr. Heragu and the OSU IEM students, faculty, and staff in Stillwater. You could feel the momentum and cohesiveness of this great team. Despite an ice storm and school closure, our IAB Student dinner had one of the highest turnouts ever. During our board meeting, we were energized with a CEAT update from Dean Tikalsky and impressed with outstanding mid-project review presentations from eight senior design teams. This spring’s class has the largest number of senior design teams that the IAB has ever mentored, and the quality and professionalism of the students continues to improve year after year. If your company has potential projects that may be a good fit for a Senior Design project, the IEM school would love to hear about them and discuss it with you. Finally, we enjoyed a lovely reception hosted by Dr. Heragu as he opened his home for us all to celebrate the success of the graduating IEM seniors. As we look forward to our Fall meeting, the IAB plans to add two new board members to the team. If you are interested in joining this amazing team, please contact Syam Anthony (IAB Alumni Outreach Chair) at syam2345@gmail.com and please include your resume.

Sincerely,
The OSU IEM Industrial Advisory Board

Members

Brian Adams
Textron Aviation

Kevin Doeksen
American Airlines

Jack Goertz
Tandem, Ltd

Jack Watts
The Portola Company

Syam Anthony
Wal-Mart Stores, Inc.

Bill Dueease
The Coach Connection

Stephanie Royce
Weamco

Jon Womack
The Wilcox Company

Dan Crawford
Power Costs, Inc.

Ashley Estes
Michelin North America

Brenda Shumate
Williams Companies

Stephanie Criner
Lockheed Martin

Matt Freeman
Burns & McDonnell

G. Satish
Connixt Inc.

“The idea of a single eureka moment is a dangerous lie. It makes us feel inadequate since we haven’t had ours. It prevents people with seeds of good ideas from getting started.”
– Mark Zuckerberg

IAB SPOTLIGHT

Jon Womack



After graduating with a bachelor's degree from OSU's IEM program in 1999, Jon started his career working for Quorum Business Solutions, where he helped improve the oil and gas plant accounting processes for energy companies in the US and Canada. Jon and his wife (Simi) then moved abroad for seven years (Amsterdam, Dubai, and Brussels), where Jon worked for PricewaterhouseCoopers and helped large companies, such as Coca-Cola and P&G, improve their tax operations through process improvement and the smarter use of technology. Jon and his family, including his 7-year old daughter (Dara), relocated to Chicago in 2013, where he worked in Commercial Banking for JPMorganChase to help improve their operations across the US and their 28 foreign branches. In 2016, after 17 years of consulting, Jon left the corporate world and obtained his Illinois real estate license and now works full-time as a real estate broker, investor, and property manager. He applies his Industrial Engineering degree to identify, acquire, and manage investment properties in Chicago and Houston to ensure streamlined costs, and to optimize income for himself and his fellow investors. Outside of work life, Jon enjoys traveling, playing soccer and tennis, and spending time with his family. Jon has served on the Industrial Advisory Board since 2015 and will become Chair in the Fall of 2018.

"Life isn't about finding yourself. Life is about creating yourself."

-George Bernard Shaw

MASTER'S AND PHD STUDENTS



IEM graduate students gather at the home of Dr. Sunderesh Heragu



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WELCOME NEW IEM STUDENTS

Welcome! We look forward to getting to know all of you and helping you on your way to becoming successful industrial engineers!

BS IEM

Abdullah Alajmi
Ghazy Alatteer
Rawan Albahraini
Naif Alemtairy
Mezyed Alghdhour
Barak Alkhaledi
Dalal Almusbalsi
Ali Almutairi

Meshal Alotaibi
Zane Masri
Hamad Mohammed
Kalyn Wells
Courtney Williams

MS IEM

Ishita Gupta
Neeraj Ahuja

MS ETM

Amy Do
Stormy Phillips
Ghaida Saeed
James Lee
Richard Rush
Katie Faulkner
Jeff Bays
Brandon Mayfield

Casey Campbell
Collin Hensley
Adetomilola Popoola
Jacob Hildebrandt
Benjamin Boswell
Brenda Shumate
Adeyemi Akinsiku

CONGRATULATIONS GRADUATES

OSU will hold its commencement ceremony on May 12th, 2018. We would like to congratulate the following IEM students for their hard work and dedication in completing their degree.

BS IEM

Brennan Adams
Will Amro
Sarah Anderson
William Boyes
Collin Campbell
Stephan Cochran
Radford Davis
Lindsay Dickerson
Ashley Fouts
Sydney Hinegardner
Stephanie Jones
Breanna Kimblern
Christopher Lacey
Wendy Lau Wong
Austin ludden
Joshua Mabin
Joseph McGrath
Albert Meza
Katie Morrison
Talor Newville

Benjamin Reynolds
Rodolfo Sandoval
Zhiwei Shao
Zechariah Shrum
Ashton Upshaw
Rhett Upthegrove
Oscar Veliz
Mitchel Villa
Jiashu Zhou

MS IEM

Ashutosh Atre
Sanchal Bakale
Praveen Kumar-
-Bharathidasan
Abhijyot Bhat
Kunal Bhosale
Harshak Bhuse
Pratik Burkule
Praveen Chakka
Viraj Chavan

Venkat Ramya Chilikuri
Shounak Gadwal
Prachiti Ghag
Akshay Godse
Lacy Greening
Rishabh Gupta
Shravan Iyer
Sourabh Jadhav
Priyanka Jaiswal
Aditya Jamdar
Kartik Josyula
Ashutosh Lohar
Venkatesh Manohar
Swaraj Meher
Raghu Muthusamy
Akshay Nigade
Aditya Nikam
Pranit Palbalkar
Ajinkya Pangaonkar
Swapnil Patki
Mitul Pimpale

Saimanikandan-
Ramesh
Jatin Selmokar
Fuzelahmed Shaikh
Anupam Sohni
Haarish Soundararajan
Venkanna Takasi
Pritesh Wankhede
Jia Yang

MS ETM

Jordan Barber
Madeline Burger
Amanda Drabek
Brittney Emerson
James Franlin
Dalton Hamilton
Chris Karambizi
Stephanie Krause
Timur Kudyakov
Mathew Lovett

Max Metcalf
Cody Potts
Ian Rivera
William Shifflett
Dylan Sirbaugh
Wil Skeen

PhD

Ali Bagheri
David Hansen

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FACULTY ACCOLADES

Hazardous Material Movement Model for Oklahoma Manjunath Kamath

Professor



A research team consisting of Dr. Manjunath Kamath (PI) and Dr. Farzad Yousefian from IEM and Dr. Scott Frazier from Biosystems and Agricultural Engineering has been working on a multi-year research effort funded by the Pipeline and Hazardous Materials Safety Administration (PHMSA) through the Oklahoma Department of Emergency Management (OEM). In the previous phases of this project, the research team developed the

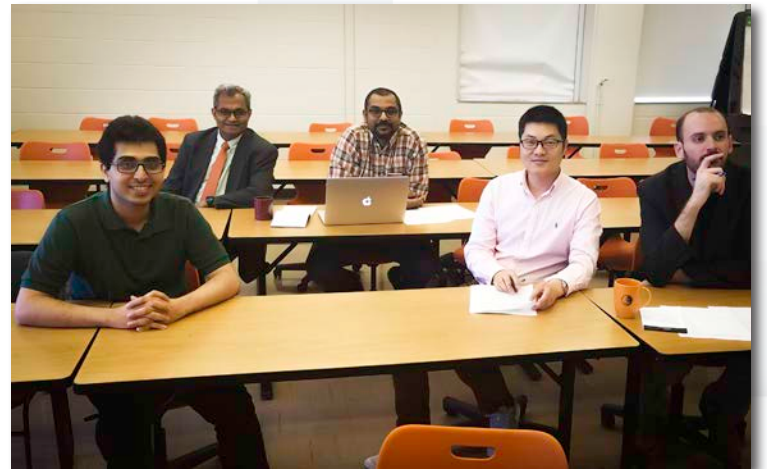
hazardous material movement model framework that includes a database of Oklahoma commercial facilities, which store materials considered as being extremely hazardous substances (EHS). A web-based survey targeting these identified EHS facilities has been developed and is being distributed to collect shipment data for the EHS materials. This approach of collecting hazmat movement data using a targeted survey of facilities is a unique feature of this research effort. Treating the surveyed facilities as origins and/or destinations, network routing and flow assignment algorithms/models are used to identify various routes used to transport EHS materials. The next step is to develop ways to visualize the hazmat flow by combining the type of EHS, amount of flow, and the frequency of transport. This would be accomplished using a GIS software such as ArcGIS®, and would include drill-down capabilities to provide specific data needed for local emergency planning purposes. The faculty and the graduate students Mr. Babak Farmanesh, Mr. Ronny Pacheco, and Mr. Goutham Takasi work closely with Mr. Tom Bergman of the Oklahoma Department of Environmental Quality who provides technical guidance and Ms. Bonnie McKelvey of OEM who is the chief sponsor of the project.

OSU IEM Team Uses Advanced Analytics for “Pickles Planning”

Baski Balasundaram

Associate Professor,
Graduate Program Coordinator

The OSU team consisting of Drs. Balasundaram, Buchanan, and Heragu, with doctoral students Yajun Lu and Hosseinalei Salemi are working on optimizing the process of making pickles! The team is working with Bay Valley Foods, LLC, a wholly-owned subsidiary of TreeHouse Foods, Inc., a private label food and beverage leader focused on customer brands and custom products.



The team is developing optimization-based analytics for master production planning, guiding decision makers as to how much each plant should produce in an allotted period. The use of large-scale optimization models and methods will enable the development of master schedules at the SKU level, as opposed to the aggregate “item class” level currently in use. The optimization models can also capture practical considerations including aggregate production capacities, staffing constraints, and workforce availability at each plant. The models will be used to drive cost-effective master planning and distribution decisions by taking a combination of time-varying raw material costs, revenues at the SKU-level, transportation/storage costs, and monthly production costs at each plant into account.

IISE SOUTH CENTRAL REGIONAL CONFERENCE



Logan Price, Lane Workman, Brittany Grubert, Erica Crain, Zechariah Shrum, and Susan Weckler

Students attended the IISE South Central Regional Conference in March 2018.



Erica Crain, Susan Weckler, Zecahriah Shrum, Lane Workman, Brittany Grubert, and other IISE members



Brittany Grubert , Lane Workman, and Zechariah Shrum

Follow Us On Social Media!



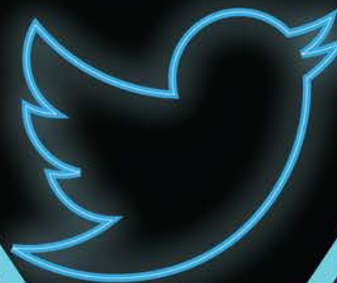
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IEM FALL 2017 COMMENCEMENT LUNCHEON

IEM held its Fall 2017 commencement luncheon on Saturday, December 15th, at the Conoco Phillips Alumni Center. Nearly 100 hundred guests, including graduating BS, MS, and PhD students and their families were in attendance along with faculty and staff from IEM.



Afeez Alebiosu
MS IEM



Rooke Jackson
BS IEM



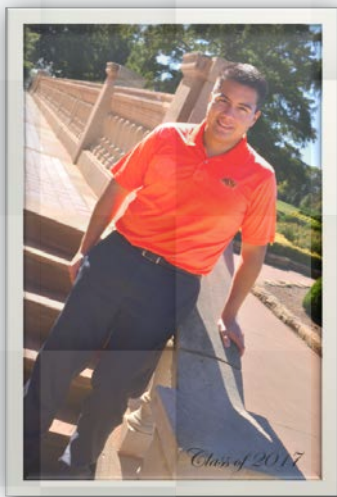
Yudong Liu
MS IEM



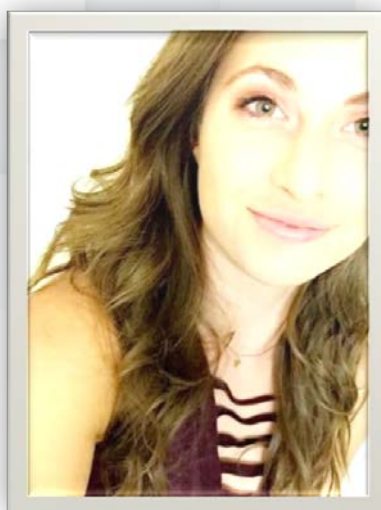
Tanner Rollins
BS IEM



Semg Hooi Lim
BS IEM



Eulojio Sanchez
BS IEM



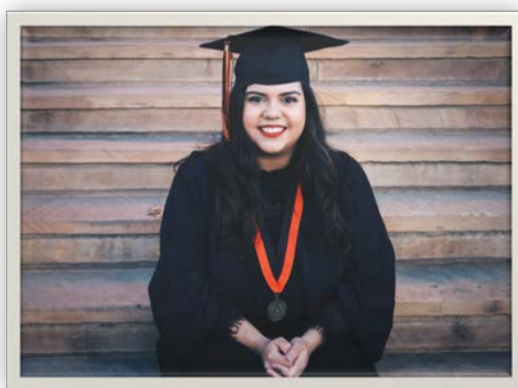
Leah Benator
BS IEM



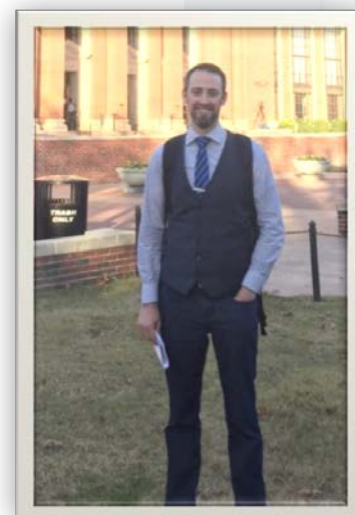
Kevin Gao
BS IEM



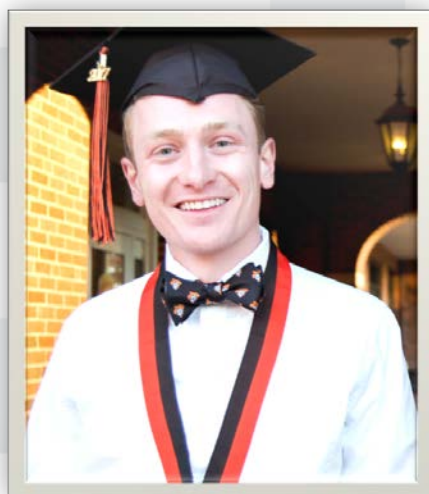
Tyler Davis
MS IEM



Patricia Mata
BS IEM



Mike Brennan
PhD



Dallas Rehberg
BS IEM



Scot Roswurm
MS ETM

WHO'S NEW IN IEM

Ben Wouters

Visiting Scholar



Ben Wouters is a short-term research scholar in the School of IEM at Oklahoma State University. He was born and raised on a farm in the Netherlands where his parents taught him to work hard. He has a Bachelor's degree in Mechanical Engineering from the University of Technology in Eindhoven. Currently Ben is an MS student with a specialization in Manufacturing Systems Engineering. This degree is a joint Master's program between the Mechanical and Industrial Engineering departments at TU/e. A project abroad is a part of this Master's program and the School of IEM at OSU has gladly provided this opportunity, for which Ben is very grateful. His main passion is working out at the gym and trying to maintain a healthy lifestyle. However, he also likes spending his Saturday nights with the boys watching sports like soccer, cycling and speed skating; while here in the United States he has gained an appreciation for basketball. In addition to sports and working out Ben is just like most American men his age and enjoys watching Netflix and spending time with his girlfriend.

**"Just remember, you can't climb the ladder of success with your hands in your pockets."
- Arnold Schwarzenegger**

Matt Taylor

Administrative Assistant
Assistant to the Graduate Program Director



Matt Taylor grew up in northwest Kansas. He got his Bachelor's Degree in Elementary Education from Fort Hays State University in Hays, Kansas and his Master's Degree in Academic Advising from Kansas State University in Manhattan, Kansas. Before moving to Stillwater, he spent over seven years teaching English at a university in China in Henan province. He moved to Stillwater this past October and started working in IEM in January 2018. He is excited to be working for Oklahoma State University and looking forward to getting to know the IEM faculty, staff, and students better.

**Hope deferred makes the heart sick, but a longing fulfilled is a tree of life.
-Proverbs 13:12**

IEM STUDENT AWARDS AND SCHOLARSHIPS

Bailey Whitman-Bonjour

Placed first in the Institute of Industrial and Systems Engineers (IISE) South Central Regional Student Conference Competition at Texas A&M University on March 3rd 2018.



Bailey Whitman is originally from Vernon, Texas. She graduated with her Bachelor's degree in Industrial Engineering from Oklahoma State University in Spring 2017 and returned to Oklahoma State to pursue her Master's degree in Industrial Engineering in Fall 2017. While at Oklahoma State, she has been a mentor in the OSU Chapter of Women Inspiring Successful Engineers on the executive team for the OSU Chapter of the Institute of Industrial Systems Engineers, and the Industrial Engineering honor society Alpha Pi Mu. After completing her Master's degree at Oklahoma State, she plans to pursue her doctoral studies in humanitarian logistics. She is interested in applying operations research models for the betterment of society.

"The happiest of people don't necessarily have the best of everything. They just make the best of everything."

2nd Place at LSC Competition

Wendy Lau Wong



Recognized as a Senior of Significance.

Hao Pan



PhD student in IEM won Second Place for HI-MAT, "PTSD: A Data Driven Approach" at the Health Data Shoot Out.



Dr. Liu with Devaraj Raghakrishnan, Raghu Muthusamy, and Haarish Soundararajan, who were part of the team that won second place in the IISE Logistics and Supply Chain Division Student Case Competition.

Congratulations and thank you for your excellent work!

STUDENT CHAPTERS

APICS

APICS OSU Student Chapter focusses on enhancing knowledge and competency of its members in the field of supply chain and operations management. To work towards its objectives, APICS Student Chapter encourages certifications and organizes events to provide our members with industrial exposure and networking opportunities.



One of the main purposes of APICS OSU Student Chapter is to encourage and guide its members to pursue APICS certifications. We are pleased to announce that we had seven members who completed their CPIM certification this semester: Aditya Jamdar, Praveen Chakka, Viraj Chavan, Shounak Gadwal, Pratik Burkule, Ajinkya Pangaonkar, and Kunal Bhosale with five more members appearing for the exam this month. a total of twelve students.

Along with encouraging certifications, we have also arranged two industrial visits this semester for our members to provide them industrial exposure and networking opportunities. Our first visit was at Armstrong Flooring facility in Stillwater. This visit gave us exposure to the methods and techniques for efficient vinyl floor manufacturing and distribution. Our second visit was in conjunction with INFORMS to Textron Aviation, Kansas. This visit was a unique and exciting experience for our members where we learned details about airplane manufacturing. Both visits helped our members to get practical experience of what they learn through their curriculum.

Overall this semester has been very successful for us as we were able to meet most of the goals we had set for ourselves and we are looking forward to the Fall semester.

Faculty Advisor: **Dr. Tieming Liu**

Committee Members:

- Ashutosh Atre, President
- Swaraj Meher, Secretary
- Mitul Pimpale, VP Education and Program Planning
- Akshay Nigade, VP Membership
- Kunal Bhosale, VP Finance
- Kartik Josyula, Webmaster

Institute of Industrial and Systems Engineers

The Institute of Industrial and Systems Engineers is excited for next year! Our mission is to enrich the educational experience of the Industrial Engineering student body, provide networking opportunities with industry and other students across the region, and assist in deepening connections across our IEM Department. IISE is looking to provide opportunities for growth for all IEM students. To achieve this goal, we are adding officer positions and revamping our organization for next year.



We would also like to recognize the students who freely gave their time and effort to make this organization great. The officers this academic year are:

- Zechariah Shrum, President
- Logan Price, Vice President
- Lindsey Dickerson, Secretary
- Alex Cannon, Treasurer
- Susan Weckler, Student Council Representative
- Erica Crain, Events Coordinator
- McKenna Morrison, PR Chair
- Stephanie Jones and Cynthia Craig, PR Committee
- Jatin Selmokar, Graduate Student Chair
- Viraj Chavan and Pritesh Wankhede, Graduate Student Representatives

Faculty Advisor: **Dr. Sunderesh Heragu**

There is a lot going on with IISE, and we would love for you to be a part of it! If you are an alumni or student who would like to get more involved with IISE, please feel free to reach out at our Facebook page, IISE Oklahoma State, or send an email to Logan Price at logp@okstate.edu.

INFORMS

The Institute for Operations Research and the Management Sciences (INFORMS) is the largest society in the world for professionals in the field of operations research, management science, and analytics. The OSU Student Chapter of INFORMS is a student-led campus organization focused on promoting student learning, professional advancement, and camaraderie with fellow students and faculty within the field of operations research and the management sciences. Our goal is to enable students to go beyond the bounds of coursework as they engage in research and extracurricular activities that lay the groundwork for their future as OR/MS professionals. Events that were organized during Fall 2017 and Spring 2018 include:



- Python workshop
- R workshop
- OR Seminar Series
- Field trip to Textron Aviation

The INFORMS student chapter advisor is [Dr. Kalyani Nagaraj](#) and the Fall 2017 student officers are:

- [Jatin Selmokar, President](#)
- [Hamidreza Validi, Graduate Vice President](#)
- [Praveenkumar Bharathidasan, Treasurer](#)
- [Fuzelahmed Shaik, Secretary](#)
- [Viraj Chavan, Public Relations Director](#)
- [Miranda Almen, Undergraduate Vice President](#)

If you have any questions or would like to connect with the student chapter, please feel free to email Jatin Selmokar at Jatin.Selmokar@okstate.edu. Also, don't forget to check out our Facebook page "INFORMS Student Chapter – Oklahoma State University" for more updates on events and chapter activities.

Alpha Pi Mu Industrial Engineering Honor Society



The purpose of Alpha Pi Mu is to recognize students who have achieved academic excellence, promote scholarly activities, and foster an atmosphere to facilitate social interaction between students and faculty. Being a part of Alpha Pi Mu gives an individual scholarship and volunteer opportunities. The society is open to juniors, seniors, and graduate students who meet the membership requirements. Last semester, Alpha Pi Mu inducted the largest group of scholars in chapter history. This semester, Alpha Pi Mu is involved in taking senior class pictures and looking into IEM tutoring opportunities. For more information about Alpha Pi Mu, you can contact Jordan Spencer, President at Jordan.Spencer@okstate.edu or visit their new website at apm.okstate.edu.

Faculty Advisor: [Dr. Terry Collins](#)

- [Jordan Spencer, President](#)
- [Erica Crain, Vice President](#)
- [Hannah Anthony, Secretary](#)
- [Jordan Spencer, Treasurer](#)

Analytical Modeling of Automated Warehouses

Dr. Sunderesh Heragu
School Head, Humphreys Chair,
Regents Professor



Recently, there has been a significant increase in the application of semi-open queuing network (SOQN) for estimating key operational performance measures of manufacturing and service systems. Jia and Heragu (2009) developed an exact analytical method for evaluating the performance of a class of SOQNs. While the Open Queuing Network (OQN) or the Closed Queuing Network (CQN) have also been used to analyze manufacturing and service systems, they tend to severely underestimate the true sojourn time of entities flowing through the system in situations seen commonly in practice. In such systems, an incoming customer must be paired with a secondary resource that stays with the customer until service is completed at the last stage (see figure 1). For example, an incoming order tote in a warehouse must be paired with a human order picker who remains with the order tote until the last item in the pick list is picked. Similarly, a product in a CONWIP (constant work-in-process) line is not allowed enter the line unless a kanban is available. Once a kanban is available, the two will proceed from one machine to the other until service is completed at the last machine. At that time, the product leaves but the kanban returns to the beginning of the CONWIP line. Although such problems have been modeled using the OQN and CQN, they are inadequate because they underestimate the true sojourn time of the part. For the example shown in Table 1, notice how severely OQN and CQN underestimate the waiting times. This underestimation is because the OQN assumes there are an infinite number of kanbans or human order-pickers, whereas the CQN assumes there is an infinite number of customers outside the network. We know that neither is true in most systems. An implicit assumption in open and closed queuing networks is that the customer or the secondary resource (kanban or orderpicker) do not have to wait for the other to be paired before they can enter the network.

The SOQN explicitly models the fact that a customer must be paired with another resource and that one of them (customer or resource) must wait in an external queue until the other is available. Using the matrix-geometric method (MGM), Jia and Heragu (2009) solve the single-class and multi-class problems with two servers exhibiting exponentially distributed service times exactly. A single-class problem has just one type of customer and a multiple-class has many types. For example, in a manufacturing system, each class represents a specific part type. They extend this approach to solve the single-class problems with n multiple servers approximately by collapsing a specific set of $n-1$ servers into one server and solving the resulting two-server system using the MGM. Solution of the multi-class problem depends upon whether each class of customers has its own dedicated set of resources. If the resources are interchangeable, the resulting problem is relatively easier to solve.

In a series of papers, the SOQN modeling approach has been used to solve design and operational problems in automated warehouses (see references [2] through [5], which represent a sample of these papers). Consider the warehouse shown in Figure 2. Pallets from inbound trucks are unloaded by a truck driver or an automated fork-lift. Autonomous vehicles (AVs, shown in red) then pick up the pallets following a first-in-first-out (FIFO) policy and take it to a storage location that is determined by a central controller. Depending upon the tier at which the location exists, the AV, along with the pallet, travels to that tier via an automated lift. The AV has two sets of independent motors, one to move it along guided rails in one direction (say x) and another to move it in an orthogonal direction (say y). After the AV and its payload reach the storage location, forks lift up the pallet and place it in its designated storage location. The transportation of outbound pallets from their storage location to waiting trucks (see the truck at the lower-left corner of Figure 2) follows a similar retrieval and transport process. There are hundreds of such automated warehouses throughout the world and alternate technologies for AVs have been implemented.

Using the SOQN methodology, it is possible to estimate key operational performance measures for alternate configurations of the warehouse. For example, the average throughput (the number of pallets stored or retrieved in a day) can be estimated for a configuration with six AVs or ten, three elevators or six, six tiers instead ten, etc. Using the SOQN, it is possible to answer questions such as the ones below quickly and reasonably accurately.

- Which specific type of technology is better for a given scenario?
- For a given warehouse application, how should the reserve area (high-rise storage) be configured? How many aisles, columns and levels are required?
- How many autonomous devices (cranes, lifts and vehicles) are required to meet the requirements of throughput capacity, cycle times, and S/R device utilizations?
- Should the high-bay area be an integrated entity, or should it be divided into zones (based on aisles, columns or tiers)? If it is the latter, how should the automated devices be allocated to the different zones?

The process in which warehouse designers explore alternate configurations and material handling technologies, estimate the performance of each for an assumed demand distribution, analyze the results and either discard the technology/configuration combination or fine-tune it to meet customer requirements, is called 'warehouse design concepting'. Design concepting has traditionally been done using simulation models and as a result, designers have been able to evaluate only a handful number of configurations before settling on a final design. With the SOQN, it is possible to quickly evaluate hundreds of alternate warehouse configurations, select a small subset based on chosen criteria, and test these further via simulation models. Such an approach typically leads to better outcomes.

Table 1.

Estimates of performance measures for a five-server tandem network (arrival rate of 15 customers per hour and service rates of 12, 13, 15, 14, and 13.5 customers per hour, respectively for the five servers) by SOQN, OQN, and CQN

Average number of customers in the system			Average waiting time of a customer in the system		
SOQN	OQN	CQN	SOQN	OQN	CQN
13.16	15.69	15	151.17	94.14	86.28

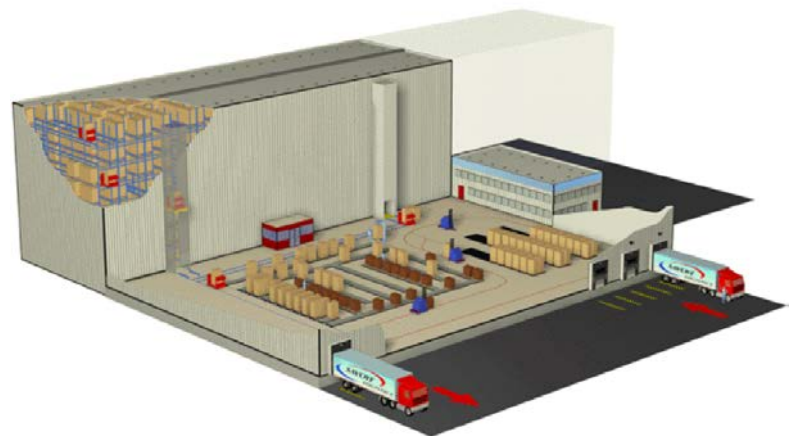
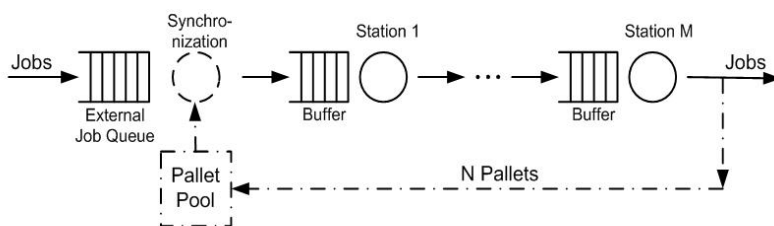


Figure 2. Automated warehouse (Courtesy of Savoye Logistics)

Figure 1. A single-class SOQN



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UNITED WAY MURDER MYSTERY



Akshay Nigade, Sai Ramesh, Amber Huffman, Lacy Greening, Bailey Whitman, and McKenna Morrison

IEM students participated in a murder mystery dinner party to help raise funds for Payne County United Way in October 2017. Students volunteered and dressed up to act and played a variety of characters from the "wild west".



Sai Ramesh with Bailey Whitman
Murder Suspect



Hannah and Lily Anthony



Sai Ramesh, The Sherriff

**INDUSTRIAL
ENGINEERING &
MANAGEMENT**

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FAIRWAY

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Highway 51!

THE COWBOY ACADEMY

The Cowboy Academy of Industrial Engineering and Management (TCA) has gotten off the ground and is aggressively pursuing multiple areas of opportunity with teams of its members for the benefit of IEM. TCA, now in its second year, has had several accomplishments in the past few months. The TCA inducted new members on September 23rd, 2017 and also elected nine Board members in late 2017. A new slate of officers was elected in January 2018.

TCA's vision is for graduates to achieve their most valued and rewarding careers. As part of this exercise, a strategic excellence position was developed by Tom Britton with input from Ken Case, Bill Dueease, and Sunderesh Heragu. This document will soon be made available on the IEM webpage and outlines four key areas in which TCA will help IEM – enhance external visibility, provide financial support, enhance student career opportunities, and foster unique relationships between IEM and the business community.

Four subgroups of TCA members have already begun work in the above areas. For example, Dave Boyer is leading an effort to enhance external visibility by bringing in professionals and hosting meetings in Sand Springs to develop a marketing plan for IEM. Another subgroup, headed by Bill Dueease, has developed a forum that allows students and alumni to post questions pertaining to careers and other relevant matters, share ideas, provide suggestions, feedback, etc. All current students and alumni of the IEM program are encouraged to sign up online at <https://osuiemacademy.org>, so they can post questions on specific topics or provide responses to them for the benefit of the IEM family. Suggestions for improving the forum are encouraged and should be sent to Bill Dueease at bill@findyourcoach.com.

• Board Members:

- Tom Britton
- Denny Carreker
- Ken Case
- Bill Dueease
- Jack Goertz
- John Harrington
- Mitch Myers
- Rick Webb
- Stacie Wrobbel

• Officers:

- Bill Dueease, President
- Mitch Myers, President-Elect
- Tom Britton, Treasurer
- John Harrington, Secretary
- Rick Webb, IEM Liaison

TCA congratulates the above officers and Board members and thanks them for their willingness to serve their alma mater.

Current Members Include:

Tony Bacher	Johann Demmel	David Kyle	Shy Ching Tay
Michael Bartlett	Bill Dueease	Rasaratnam Logendran	Lyndon Taylor
Terrance Beaumariage	Laura Easley	Neal McCollom	Jack Watts
Leland Blank	John English	Mitch Myers	Rick Webb
David Boyer	Jack Goertz	Ron Orr	Lawrence Whitman
Shay Braun	Jeff Greer	David Pratt	Marion Williams
Thomas Britton	John Harrington	Kent Powers	Eric Woodroof
Denny Carreker	Don Humphreys	Bill Remy	Stacie Wrobbel
Kenneth Case	Stuart Keeton	Jack ReVelle	
Samuel Combs	Behrokh Khoshnevis	Ting Nee Su	

INDUSTRIAL ASSESMENT CENTER

The OSU Industrial Assessment Center (IAC), funded by the US Department of Energy (DOE) provides extensive energy-efficiency services to small and medium-sized manufacturers in the United States. Currently the IAC program is administered through the Advanced Manufacturing Office (AMO) under the Office of Energy Efficiency and Renewable Energy (EERE). Twenty-eight IACs serve all the regions of the United States. IACs provide energy, water, waste, and productivity assessments for clients in their respective regions.



The IAC located at Oklahoma State University has a history that reaches back more than 30 years. Since 1976, the Industrial Assessment Centers have helped American manufacturers save energy, reduce costs, and increase productivity during an era of energy supply volatility and rising prices. Personnel associated with the IAC have completed over 985 energy assessments for manufacturing clients, located in Oklahoma, Kansas, Arkansas, and north/northwest Texas. The IAC affiliate at Wichita State University (WSU) has a history of ten years in a working partnership with the OSU IAC. Our OSU IAC team is an experienced staff of Oklahoma State University faculty members and students. Currently, Dr. Hitesh Vora (Assistant Professor – Mechanical Engineering Technology) serves as the IAC Director. At any one time, we have a staff of 10 to 15 students ranging from Ph.D. to M.S. to undergraduate upper-division students.



The stated mission of our IAC is to provide our clients, potential clients, and partners with industrial assessments (at no cost to the client) that will help reduce energy and waste and increase productivity, while educating and training the next generation of energy, waste, and productivity professionals. Our goal is to save our clients at least 10% of their energy costs, in a cost effective manner. Over the past five years, our IAC has averaged recommended savings of over \$110,000 per client (over 14% of total utility bills), as well as significant savings in CO₂ and pollutants in the energy chain. An associated goal is to produce graduates who are technically competent and able to handle all facets of client relations and

communications, so that they will be prepared to serve as energy engineers and to be in demand by employers. In addition, our mission is to work throughout our region to coordinate with utilities, manufacturing extension programs, and manufacturing associates in order to provide potential clients (in addition to the ones directly served) with relevant information on plant energy conservations and the facilitation of effective and efficient energy management systems. Compliance with DOE/FM requirements includes timeliness of reports, participation in Best Practices activities, contributions to the Office of Energy Efficiency and Renewable Energy (EERE) goals and objectives, and other requirements as communicated to the IAC

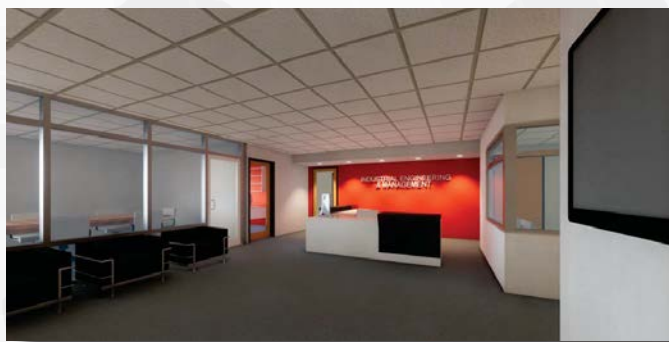
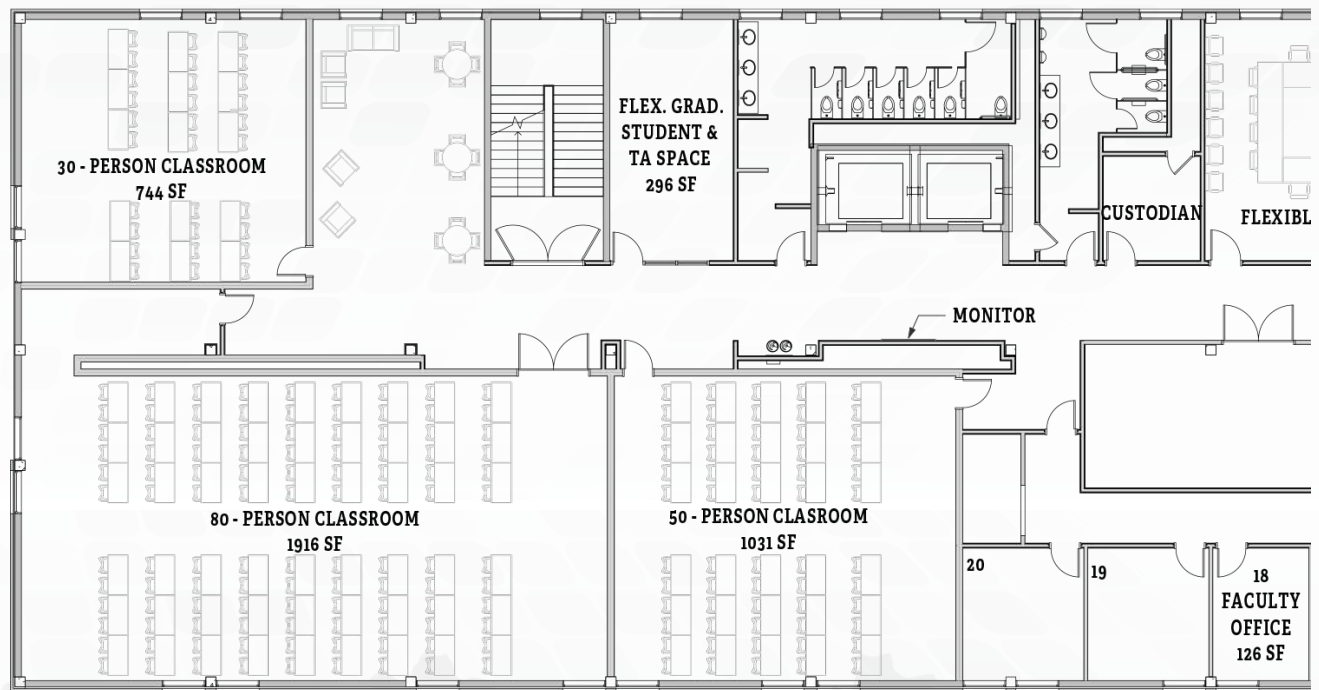
For more info, please contact Dr. Hitesh D. Vora (Director – OSU IAC) via hitesh.vora@okstate.edu or 405-744-9578

EN 3RD FLOOR RENOVATIONS!

OKLAHOMA STATE UNIVERSITY FOUNDATION / FACILITY SUPPORT

COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY

Industrial Engineering and Management - Preliminary Floor Plan - 3rd Floor

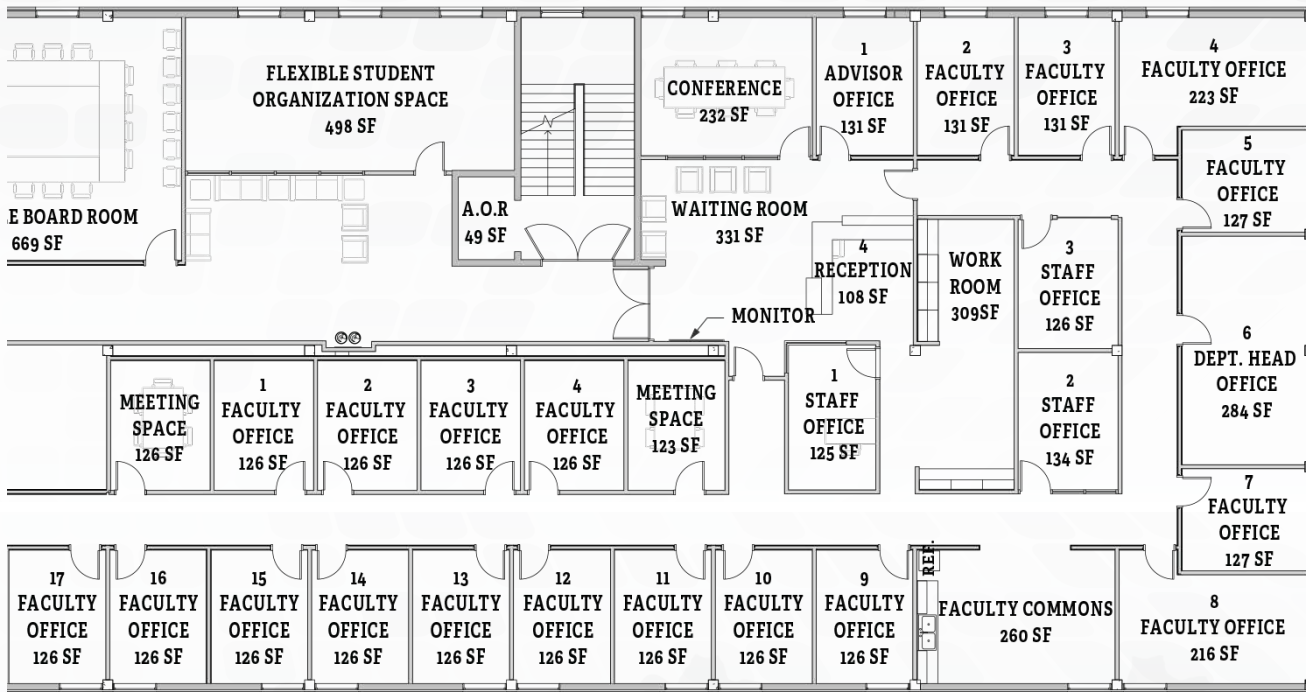


Big Changes Are Coming To IEM!

As we are ending another semester, we are preparing for major renovations in IEM! This summer IEM will be moving to the 2nd floor of the former business building, now known as the General Administration Building (GAB). This move will take place before Fall 2018 classes begin. During the renovations of the 2nd and 3rd floors in Engineering North, we will be in the GAB for approximately one year. We are very excited about these changes. To see some examples of what to expect, please view the previously renovated 4th and 5th floor of Engineering North. There are also some digital fabrications of the new floor plan on this and the preceding page so you can get an idea of what to expect!

Please stay tuned in to the IEM social media accounts for updates and announcements!

For video tours and pictures, click the following link: <https://iem.okstate.edu/renovations>



Naming Opportunities

- 30-Person Classroom |
- 50-Person Classroom |
- 80-Person Classroom |
- Advisor Office |
- Board Room |
- Conference Room |
- Department Head Office |
- Faculty Commons |
- Faculty Office (20) |
- Graduate Student & TA Space |
- Meeting Space (2) |
- Reception |
- Staff Office (3) |
- Student Organizations Space |
- Work Room |

How to give

- Go to iem.okstate.edu
- Click the **GIVE** button
- Complete the secure online form
- Include instructions regarding the use of your gift in the "comments" field

For more information contact **Bryce Killingsworth** at bkillingworth@osugiving.com or 405.385.5623

SENIOR DESIGN



IEM Spring 2018 Senior Design Class

Graduating Industrial Engineering and Management (IEM) seniors conclude their academic studies with a capstone course called Senior Design, taken in their last semester. During this course, student teams work as outside 'consultants' on real-world problems for clients, manufacturing and service. The projects provide students the opportunity to apply the theories and tools they have learned to provide clients with innovative solutions to a problem.

RECENT SENIOR DESIGN PROJECT CLIENTS

Clients are typically located within a two-hour drive from the OSU-Stillwater campus, and have included:

- Atwoods Distributing
- City of Stillwater
- Cleats For Kids
- Ditchwitch
- Federal Aviation Administration
- INTEGRIS Health
- Mary Martha Outreach
- Mexico Joe's
- NORDAM
- OKCWorks
- Payne County Expo Center
- Stillwater Public Schools
- Webco Industries



Austin Ludden, Ashton Upshaw,
& Joshua Mabin



Joey McGrath, Lindsey Dickerson,
& Collin Campbell



Zhiwei Shao, Sydney Hinegardner,
Sarah Beth Anderson, & Stuart Boyes



Rhett Upthegrove,
Stephanie Jones,
Harper Zhou, &
Albert Meza



Brennen Adams, Zechariah
Shrum, Ashley Fouts, & Will
Amro



Mitchel Villa,
McKenna Morrison,
Radford Davis, & Chris Lacy



Spencer Jones, Breanna
Kimblern, Wendy Lau Wong, &
Benjamin Reynolds



Stephen Cochran, Talor Newville,
Rodolfo Sandoval, & Oscar Veliz

BABIES OF IEM



Natalie Jean-Marie Hurlbert
Born to
Holly Palmer and Dylan Hurlbert
September 7, 2017



Jackie Lu
Born to
Yajun Lu and Qian Gao
November 3, 2015



Praisya Upadhaya
Born to
Pragya Niraula and Prajwal Upadhaya
July 18, 2017



Aida Amini
Born to
Mostafa and Maryam Amini
May 10, 2017



Diana Bagheri
Born to
Ali Bagheri and Farideh Safar
Zadeh Arani
February 27, 2018

Chris Lacey Agrees to Terms with New England Patriots!



Chris comes from Desoto, Texas, where he graduated 3rd in his class of 610, from Desoto High School, in 2014. Along with pursuing his BS IEM degree, Chris has played football as a wide receiver for the OSU Cowboys all four years while wearing #15. Chris has just agreed to terms with the New England Patriots and will play in the NFL as long as he is able to. When his football career comes to an end, he plans to stay close to the sports industry by seeking a position as a director of operations for a team or stadium/arena.

IEM FACULTY

Dr. Baski Balasundaram
Associate Professor and Graduate
Program Director

Dr. Juan S. Borrero
Assistant Professor

Dr. Austin Buchanan
Assistant Professor

Dr. Terry Collins
Associate Professor and
Undergraduate Program Director

Dr. Camille DeYong
Associate Professor

Dr. Jennifer Glenn
Lecturer

Dr. Tim Hardin
Lecturer and ETM Director

Dr. Sunderesh Heragu
Regents Professor and School Head
Donald and Cathey Humphreys
Chair

Dr. Manjunath Kamath
Professor

Dr. Tieming Liu
Associate Professor

Dr. Kalyani Nagaraj
Assistant Professor

Dr. Farzad Yousefian
Assistant Professor

Dr. Chaoyue Zhao
Jim and Lynne William Chair
Assistant Professor

IEM STAFF

Laura Brown
Senior Financial Assistant
Administrative Support Supervisor

Michael Hall
Student Worker

Amber Huffman
Administrative Support Assistant

Brenda Johnson
Assistant Director, ETM

Matt Taylor
Administrative Support Assistant
Assistant to Graduate Coordinator

Jillian George
Administrative Support Specialist, ETM



School of Industrial Engineering
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322 Engineering North
Oklahoma State University
Stillwater, OK 74078
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@IEMOKstate



@OkStateIEM

Front cover page photo: The picture on the front cover is a glance at the beautiful Spring foliage that lives on OSU's campus.

Back Cover page photo: The picture below is of the Edmond Low Library.

Photo Credits: Bob Ingersoll, IEM alumnus

