# Oklahoma State University

School of Industrial Engineering and Management

College of
Engineering, Architecture and Technology

# COWBOY CONNECTIONS

FALL 2020

# Table of Contents



**Dr. Sunderesh S. Heragu**
School Head
Regents Professor and
Humphreys Chair

**Dr. Tieming Liu**
Graduate Program
Director
Associate Professor

Hello,

Our thoughts and wishes are with you as we all grapple with the COVID-19 pandemic. We hope Cowboys, families, and friends everywhere are staying safe and healthy.

IEM has come a long way since it awarded the first BS degree in 1926. I will outline a few bullet points that attest to our growing stature and reputation.

- We are highly ranked—IEM is ranked #23 among public universities by US News
- The MS ETM is ranked #11 among public universities by US News
- We have world-class faculty
- Our students are sought after by companies such as Apple, Amazon, ConocoPhillips, Disney, Dell, ExxonMobil, Google, Home Depot, Koch Industries, Microsoft, Nike, P66, Pepsico, Walmart, Webco, Tesla, and many, many others
- Undergraduate enrollment has doubled
- IEM had its largest graduating class ever in 2019, more than twice the number in recent years
- IEM renovated its floor and has expanded its footprint. We now occupy the entire 3rd floor of Engineering North
- IEM is working towards a $20 million endowment goal and is nearly half way there
- There is a new level of energy in IEM

Our website has been updated and the new site is available at http://iem.okstate.edu. Please check out all the happenings in IEM and let us know how we can improve our services for you.

Two teams from the Spring 2021 class were two of ten finalists in a national competition organized by the Industrial Advisory Board of the Institute of Industrial and Systems Engineers (IISE). Wuyang Qian, Suhao Chen, Jayesh Yevale, and Kushal Shah placed first in the DAIS data analytics competition organized as part of the 2020 Annual Industrial Engineering conference. Maggie Goodin, senior in IEM, won the UPS Minority Scholarship. Ken Case, emeritus faculty and NAE member, won the Medallion award from IISE. Brenden Dominick was selected to present his research at the Capitol.

The BS IEM curriculum has undergone a revision and we will be rolling out the new program in Fall 2021. We are excited to announce that we will be launching the BS IEM program in the OSU Tulsa campus, effective Spring 2021.

The Industrial Advisory Board is very active providing input on our curriculum, mentoring senior design projects, and sponsoring scholarships for our students. Just recently, the IAB announced that Brandon McKisick, a senior and IISE President, is the recipient of the 2020 IAB Scholarship. I offer my sincere thanks to the IAB for the active role they play in advancing IEM.

The Cowboy Academy of Industrial Engineering and Management (TCA) inducted ten members in September. TCA has been active offering webinars for undergraduate and graduate students, developing fundraising plans, marketing plans, and sponsoring a marketing intern for social media outreach and publications. In fact, this newsletter was prepared by Myers Turner, marketing intern, who is pursuing her BS in Marketing from the Spears School of Business. She will graduate in May 2021. Thanks to Myers, we have now increased our social media outreach. You will now see at least one post a week on Facebook, Instagram, LinkedIn, and Twitter as well as one via ConstantContact. Welcome aboard Myers!

As the third oldest industrial engineering program in the world, we have much to celebrate as we approach our 100th anniversary. There is a new level of energy in IEM. With your continued support, we can scale even greater heights. You can give towards scholarships, endowed professorships, or endowed chairs. Every gift from alumni count. They go a long way in helping prepare our students for a long and successful career. To make your contribution, click here. You can also send a check to Ms. Laura Brown, EN 354, School of Industrial Engineering and Management, Oklahoma State University, Stillwater OK 74078.

If you would like to be engaged with IEM or receive periodic communication from us, send your email address to iem@okstate.edu.

Follows us on social media!
Facebook: Oklahoma State IEM
Instagram: iem_okstate
Twitter: okstateiem
LinkedIn: OSU Industrial Engineering and Management

Go Pokes!

**Sunderesh S. Heragu**
School Head, Regents Professor, and Humphreys Chair

# IEM Mission, Vision, and Goals

## Vision
To inspire and empower our students to become leaders in a wide variety of industries, improve the quality of life for humankind, and change the world for the better, by making societal systems diverse, effective, efficient, and sustainable.

## Mission
Continuously and aggressively advance educational and research processes which will attract students who fulfill our vision.

## Educational Goal
Continue to improve, monitor, and enhance the student recruitment, learning, graduation, and placement processes to produce leaders proficient in theoretical, applied, and technology relevant concepts and practices that have a global reach and global impact.

## Research Goal
Engage in cutting edge research of global importance to produce innovators and next generation engineering, education, and societal leaders.

## Outreach Goal
Actively engage in community projects, economic development and service for the greater good. Enhance IEM's image internally within CEAT and OSU, and externally - the world at large.

## Diversity Goal
Ensure that all school activities promote a diverse, achievement driven and gifted student experience. Administer programs to recognize the diverse challenges of each identity group and improve the retention rate from admission to graduation.

# The Next Five Generations

IEM has been fortunate to have had the resources and the support that have made it possible to recruit, train, and produce leaders in our society. To benefit the next five generations, we launched a $20 million by 2020 campaign in December 2014 and have made good progress toward that goal. From $2.4 million in Fall 2013, our endowments (including deferred gifts) have risen to $8 million. The remaining $12 million must be raised in the next few years. 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.

**Study Abroad Scholarship | $2,000 per student**
*Scholarships can be awarded to up to 12 students*

**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 | $8,500,000**

If you wish to donate, please send a check payable to the "Industrial Engineering and Management Excellence Fund" at Oklahoma State University, 354 Engineering North, Stillwater, OK 74078 or make a gift online by clicking the GIVE button at ceat.okstate.edu/iem.

For more information please contact
**Bryce Killingsworth** – Associate Development Director
Office: 405-385-5623
Cell: 405-385-3497
Email: bkillingsworth@osugiving.com

## Student Spotlight

**Cassie Johnson**
Undergraduate Student

Cassie Johnson is from Tulsa, OK, where she began her college career at Tulsa Community College. She completed her freshman year there, before transferring to Oklahoma State University and calling Stillwater her home. She is graduating this December with a degree in Industrial Engineering and Management. Along with her undergraduate coursework this Fall, she has also begun her Master's in Business Administration. After graduation, she plans to continue her MBA virtually while working full-time. Throughout her school years, Cassie has worked as an Engineering Intern part-time and has had the opportunity to intern with three great companies during her summers. Her internships and schoolwork have helped her to develop a passion for leading and mentoring others, and she has recently started mentoring new students through the OSU peer mentor program because of this. Cassie is interested in pursuing a position in manufacturing engineering because she enjoys working with cross-functional teams and she has a passion for lean manufacturing. She is specifically interested in a rotational program where she could spend a few months at several locations within a company in order to learn and grow as an engineer in various work environments. Outside of the classroom, she enjoys cooking, fitness/exercise, and all things sports and outdoors.

"People would rather follow a leader who is always real than one who is always right." –Pastor Craig Groeschel

# Student Spotlight

**Matthew Wilkinson**
Undergraduate Student

Matthew Wilkinson is a fourth-year student set to graduate this Spring with his degree in Industrial Engineering and Management. Growing up in Bixby, Oklahoma as a fourth-generation Cowboy, Matthew always knew he wanted to come to Stillwater to further his education. Through his coursework and extensive involvement in our student chapter of IISE, Matthew has come to love Industrial Engineering. With internship experiences in project management and procurement, he's now seeking opportunities to serve in a more traditional IE role where he can focus on driving process improvement in manufacturing operations. Though he is a proud Oklahoman, Matthew plans to move to Colorado Springs, CO after graduation, where he can pursue his favorite hobbies of hiking, rock climbing, and skiing.

"Whoever wants to be great must become a servant." – Jesus Christ

**Robert Stracener**
Master's ETM Distance Education Student

Robert is in the Master's of Engineering and Technology Management program, and is set to graduate this December. Before coming to Oklahoma State, Robert completed Bachelor's degrees in Human Biology and Chemical Engineering at the University of Kansas. He then became an Engineering Consultant with Hyde Engineering + Consulting, where he has worked the past four years supporting clients in the biotechnology and pharmaceutical industries. As a distance student, he has little on-campus involvement, but he hopes to attend some OSU sporting events in the future. He recently celebrated his third anniversary with his wife, Deidre, at their home in Denver, Colorado. In his small amount of free time, Robert enjoys backpacking, hunting, fishing, brewing beer, cooking, and playing disc golf. After graduation, armed with ETM skills, he will continue to pursue a management track position in the Biotech/Pharma sector.

"Failure isn't fatal, but failure to change might be." –John Wooden

## Student Spotlight

**Jackson Baker**
Master's Student

Jackson Baker, originally from Oklahoma City, is set to graduate this May with his Master's degree in Industrial Engineering & Management, specializing in Operations Research. Jackson finished his undergraduate honors degree in IEM in Fall 2019, a three and a half-year journey capped off by an award-winning senior design project, in which his team designed a new supply chain network for a nearby manufacturing company.

Wanting to learn more about supply chain and optimization, Jackson jumped directly into the Master's program at OSU, thankful for the opportunity to challenge himself with advanced courses and become more involved with IEM. While in the IEM program, Jackson has worked as a teaching assistant for VBA programming and information systems design courses, and as a researcher in hazmat transportation risks. He has also served as an officer for Alpha Pi Mu and maintains an active IISE membership.

When he's not doing homework or trying to be the best TA he can be, Jackson is usually with the OSU Navigators ministry, where he studies the Bible with friends. He also enjoys golf and plays cello in his church's band. After graduation, Jackson hopes to begin a career in supply chain optimization that allows him to continue working hard and helping others in his community.

"Whatever you do, work heartily, as for the Lord and not for men." –Colossians 3:23

# Student Spotlight

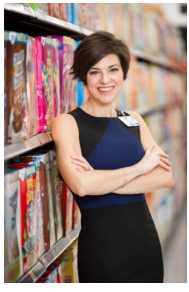
**Harshal Kaushik**
Doctoral Student

Harshal is a Ph.D candidate, specializing in mathematical optimization. Before this, he obtained his Master's degree from the Indian Institute of Technology (IIT), Madras, in Applied Mechanics, specializing in aerodynamics. His work has been recognized in the American Control Conference, Energy Procedia, and published in the *International Journal of Reliability and Safety*. Harshal is interested in large-scale and distributed optimization, machine learning, and aerodynamics. He is the recipient of the Roy and Virginia Dorrough Graduate Fellowship. He is a member of Alpha Pi Mu honor society and the Institute of Operations Research and Management Science (INFORMS).

Before beginning his doctoral studies, he worked as a Project Associate at IIT Madras. He has also served as an Operations Research Intern at Schneider, in Wisconsin. Apart from work, he enjoys playing guitar. His future plan is to find a position where he can combine his passion for aerodynamics and his love for mathematical optimization.

"If you can't explain it simply, you don't understand it well enough." –Albert Einstein

# Alumni Spotlight



## Megan Crozier

**Tell us a little bit about yourself.**
I became the Chief Merchant at Sam's Club in September 2019. In this role, I lead a cross-functional team of merchants, pharmacists, product managers, and product developers who are focused on curating the best assortment for members.

Before joining Sam's Club, I was the Senior Vice President and General Merchandise Manager of Packaged Goods for Walmart U.S. I became a merchant in 2005 and have experience buying for various categories, including electronics, frozen food, and dry grocery. I began my career as an industrial engineer in the Walmart grocery distribution center in Temple, Texas. Gaining a deep understanding of the supply chain and replenishment business provided valuable insights that continue to serve me today.

I have a Bachelor of Science degree in Industrial Engineering and Management from Oklahoma State University. When not at work, my husband Ryan and I, can be found spending quality time with our two young daughters. My favorite hobbies include working out, buying expensive shoes, and drinking red wine.

**How has your IEM degree helped you?**
I always tell people I received a degree in "problem solving." I believe IEM taught me how to think through, process, and solve really complex problems and consider the 360-solution needed. I ask the question every day—"what's the real problem I'm trying to solve for the customer and how should we approach the solution?" I believe IEM set me up for success.

**List one or two highlights of your career.**
I have worked for Walmart, Inc for over 17 years. I would have to say becoming an officer for the world's largest company—just 2 weeks after returning from maternity leave with my eldest daughter—was humbling!

**What has motivated you to stay engaged with OSU, years after graduation?**
Some of my fondest memories are from my time at OSU - the full five years! I love reinvesting back in individuals just coming into their working years. It's fun to help those just starting their career! People took time to invest in me and I want to pay it forward.

**What do you think the future holds for the IEM student?**
I think IEM is a degree in problem solving and it allows you to solve any kind of problem! I think the future is bright for our IEM graduates!

# Industrial Advisory Board

Hello OSU IEM Family!

The IAB hopes that everyone is staying well this year. COVID has affected many things and unfortunately we were not able to meet in-person for our Fall meeting. However, we were able to conduct the event virtually and had a productive meeting. Below are a few of the highlights/topics that were of focus:

- Support faculty and school through the accreditation cycle
- Hiring suggests that we are preparing graduates for bright careers - companies are continuing to return to OSU to recruit
- Ideas to enhance LinkedIn presence
- COVID impact on campus
- Opportunity to mentor and coach the senior design teams on the projects listed below:

The other highlight was meeting with the senior design teams working on the following projects:

| Client | Project |
|---|---|
| OnCue | Taco Production Line Optimization |
| Webco Industries | Equipment and Facility Layout |
| AstraZeneca | Mobile Vaccination Clinic Planning Tool |

If you have ideas for future senior design projects and/or internships for either undergraduate or graduate students, please reach out to Dr. Heragu (sunderesh.heragu@okstate.edu)

We are also in the process of finalizing the award of the IAB scholarship. Our scholarship committee helped lead us through the candidate evaluation as we were blown away at the caliber of the students who applied. This is an annual award that is given by the IAB to an IE student who meets the requirements and we feel will benefit the IE profession once out of school.

**Breaking News: The IAB has awarded the 2020 scholarship to Brandon McKisick!**

One thing that was apparent through our discussions with faculty, students, and other board members was the fighting OSU spirit. With all we are battling right now, we are still finding ways to win. Yes it looks different, but we are thinking outside of the box to help support each other and rise above the challenges. May we never lose that spirit.

With warm regards,

The OSU IE&M Industrial Advisory Board

## IAB Members

Brian Adams
Textron Aviation

Syam Antony
Nike, Inc.

Kevin Doeksen
American Airlines

Bill Dueease
Findyourcoach.com

Ashley Estes
Zeus Industrial Products

Michael Foss
Team Foss

Jack Goertz
Tandems, Ltd

Frank Groenteman
TMAC

Steve Kiester
Bell

Ed Pohl
University of Arkansas

Zach Roberts
J.B. Hunt Transport Inc.

Stephanie Royce
Oklahoma State University

G Satish
Connixt, Inc.

Tom Saunders
Pioneer Natural Resources

Brenda Shumate
Williams Companies

Jack Watts
Portola Company

Jon Womack
Third City Properties

# New Students

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

**BS IEM**
Aisley Kyle
Ananya Singh
Andrew Caraway
Ann Wedge
Aymen Charmi
Bella Baker
Bradyn Newberg
Claire Kinnaird
Colton Peery
Cooper Goldsworthy
Ethan Inman
Gabriel Bisogno Mendez
Graham Robinson
Hannah Hazelip
Iris Martinez
Jack Little
Jacob O'hara
Jamayel Alnajem
Jarrett Smith
Keegan Cook
Kelton Hagerman
Laura Singletary
Logan Davis
Peyton Dayer
Philip Petersen
Phoenix Perkins
Ray Lucas
Ricky Reed
Vamsee Sunkar

**ETM Certificate**
Navin Reddy

**MS ETM**
Jason Throckmorton
Aaron Lozano
Christopher Isch
Joshua Pearce
Joyce Callen
Kyle Corriveau
Tyler Coffman
Hiep Chuong
Alissa Lory
Devin Geeteh
Brandon Alexander
Conner Copeland
Sam Denmark
David Tebbett
John Price
Isabelle Kearney
Eric Poythress
Ian Bondy
Joel Short
Daniel Galvin
Allan Jess Balcita
Stevenson Dang
Shmuel Blacher
Alexander Burkdoll
Kaitlynne Crawford
Aaron Lua

**MS IEM**
Elizabeth Bunting
Swapnil Gajjar

**PhD IEM**
Zekai Wang
Jianxin Xie

# Graduates

**OSU will be recognizing its Spring 2020 graduates virtually as part of the Fall 2020 commencement ceremony. We would like to congratulate the following IEM students for their hard work and dedication in completing their degree.**

**BS IEM**
Ibrahim Abuemah
Saud Alotaibi
Chisom Anunobi
Elizabeth Bunting
Molly Cannon
Alex Cannon
Christopher Clark
Derek Dixon
Nathaniel Echols
Jennifer Fallon
Brittany Grubert
Kasey Hendrick
Allison Hines
Macie Hull
Rylee Hunter
Lauren Lenaburg
Samuel Lewallen
Christopher Looney
Brett Mallon
Cristina Montemayor Garcia
Justin Paxson
Mason Pitts
Evan Rackley
Michaela Reimonenq
Charles Robson
Madison Rundell
Breonna Sattre
Victoria Stow
Cade Timmons
Cora Watts
Hunter West
Lane Workman

**ETM Certificate**
Martin Bortolutti

**MS ETM**
Adeyemi Akinsiku
Brett Bishop
Brock Carter
Adam Dorety
Anthony Drummond
Maribel Espinoza-Hoover
Angela Guthrie
Collin Hensley
Guillermo Morales
Gabriel Orrico
Stormy Phillips
Adrian Smith
Jonathan Smith
Mark Threadgill
Bradley White
Eric Wright

**MS IEM**
Bailey Bonjour
Lacrea Crawford
Samantha Huckabay
Seng Hooi Lim
Pragya Niraula
Viplav Patil
Abhimanyu Sah
Devarshi Tharwala
Md Mahabub Uz Zaman

**PhD IEM**
Diana Rodriguez Coca

## IAB Spotlight

### Michael Foss

Executive Leader in Supply Chain Excellence & Transformational Change

Michael Foss is passionate about finding optimal solutions for success. He thrives on inspiring and motivating leaders to achieve and sustain transformational success. He has led large global teams to be enthusiastic, embrace innovation and disruption, seek relentless improvement, never give up, and never settle for mediocrity.

Michael was born in Albuquerque, NM and now resides in Southlake, TX (the DFW area). He has a BSIE from Texas Tech University and a LEAN/Six Sigma Black Belt from Villanova. He is also certified to train the Power of Positive Leadership by Jon Gordon and is also licensed and certified as a John Maxwell Certified Coach, Teacher, Trainer, and Speaker, offering workshops, seminars, keynote speaking, coaching, and consulting—aiding your personal and professional growth through study and practical application of John's proven leadership methods.

Michael's career includes 20 years with FedEx, five years Oil and Gas (Weir and Cameron), four years with Amazon (Process Engineering & Continuous Improvement), one year with Caterpillar (GM Global Transportation), and now he is the Founder and CEO for CoachFoss LLC as a Keynote Speaker, Trainer, Consultant, and Author.

Michael is an IISE Fellow, Sr. Member, Past President, CEO, CFO, SVP Regional Operations, and Past Member of CISE. He serves Industrial Advisory Boards for IISE, ABET, Texas Tech University, & Oklahoma State University. He has been inducted into the TTU Academy of Industrial Engineering, serves on the TTU Dean's Council as Chairman, and is a TTU Whitacre College of Engineering Distinguished Engineer.

Michael enjoys golf, football, international travel, and serving others to help them live the best version of themselves. He is launching a membership site for leaders whom want to overcome limitations and excel in work and life and is also authoring his first book.

## Awards and Honors

Margaret Goodin
*UPS Scholarship for Minority Students*

Brenden Dominick
*Selected to present research at Research Day at the Capitol*

Elizabeth Bunting, CJ Clark, Chris Looney, and Hunter West: Optimize Distribution Network Optimization Plan to Fulfill Orders in Two Days at Assa Abloy
*Top 10 Finalist Team*
IISE Outstanding Capstone Senior Design Competition

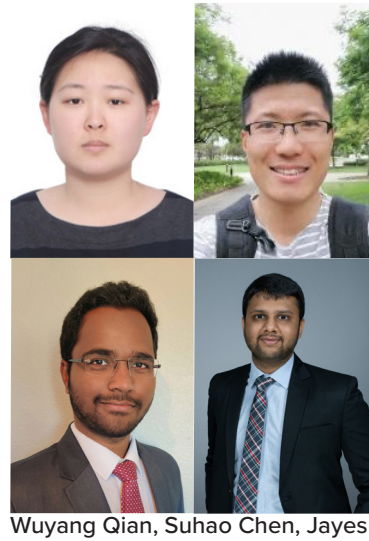
Kasey Hendrick, Saud Alotaibi, Erin Kraft, and Lauren Lenaburg: Capacity Improvement Modeling at Integris Health
*Top 20 Finalist Team*
IISE Outstanding Capstone Senior Design Competition

# Awards and Honors

Dr. Ken Case
*Medallion Award*

Dr. Baski Balasundaram
*Promotion to Professor*

Paula Sarmiento
*Paul E. Givens Diversity Scholarship*
Awarded by Alpha Pi Mu to an outstanding member that demonstrates scholarship, leadership, sociability, ethicality, and widespread interests.



Wuyang Qian, Suhao Chen, Jayesh Yevale, and Kushal Shah
*First Place*
DAIS data analytics IISE competition

# New Staff

**Myers Turner**
Undergraduate Business Student

Myers joined the IEM staff this Fall as our Marketing Intern. She has been posting on the social media accounts, building our email databases, and even helping put together this newsletter, in an effort to get IEM students, faculty, alumni, and potential new students, more connected with IEM. She is a third year student in the Spears School of Business, double majoring in Marketing and Management. She is from Edmond, Oklahoma and plans to graduate this May.

On campus, she is involved in her sorority, Kappa Alpha Theta, and is a member of Business Student Council and Sales Club.

After graduation, Myers hopes to continue her education and pursue a Master's degree in Business Administration, with a concentration in Global Marketing, at Oklahoma State University. Once out of school, she plans on starting a career in a marketing or sales role.

"Let all that you do be done with love." –1 Corinthians 16:14

# Faculty Awards

## REED-APPLE AWARD

**Dr. Sunderesh Heragu**

Dr. Sunderesh Heragu, Head of the School of Industrial Engineering and Management at Oklahoma State University, was awarded the Reed-Apple award for his contributions to material handling research and education.

The Reed-Apple award is a lifetime achievement award given to those who have made extraordinary contributions to material handling research and education. The Reed-Apple has only been awarded 20 times over the past 40 years. The award was established by the Material Handling Institute (MHI) in 1981 to honor the memory of Dr. Ruddell Reed Jr and Dr. James M. Apple.

Heragu excels not only in material handling research but also in education. He has written a college-level textbook titled *Facilities Design* which is currently in its 4th edition. He has also produced software called *10 Principles of Material Handling*. “I have had multiple projects in material handling funded by the National Science Foundation,” Heragu said. “Many of these projects had industrial collaborators.”

Heragu has worked on research projects with several companies such as Vanderlande Industries and Savoye Logistics, which are based in the Netherlands and France, respectively. “Receiving the Reed-Apple award was very exciting, but also humbling,” Heragu said. “To be counted amongst titans in the field is a huge honor.”

MHI also provides scholarships to students at Oklahoma State University, giving them an opportunity to pursue careers in material handling. Heragu has been involved with MHI for a long time, speaking at many research colloquia and teachers’ institutes. In the field of material handling and material handling education, Heragu hopes to leave a lasting impact through his research, books, and software.

# The Cowboy Academy

**The Cowboy Academy Vision**
*For graduates to achieve their most valued and rewarding careers!*

In 2020, the Cowboy Academy has been moving forward in the pursuit of enhancing the opportunity for a valued career for graduates. As I write this, we have successfully completed our first virtual annual meeting of the membership. This year we have inducted new members to the Academy virtually. Additionally, we have decided to conduct an orientation. The purpose is to introduce members (new and old) to the Vision & Mission of the Academy, our administrative processes, and our active work. The process has been well received and any member who would like to participate is welcome.

As President, my goal this year was to provide solid footing for each of our committees to make real progress toward each of the TCA Mission components:

**Enhance external visibility -** The Academy will participate both in conjunction with the IEM department and independently in pursuit of lifting the image of OSU Industrial Engineering as one of the top schools in the United States to pursue an education in Industrial Engineering. Additionally, the academy has to goal raising awareness and marketing OSU IEM to prospective students, parents and school administrators.

- In 2019, the Marketing Committee Chair, Dave Boyer led the Academy to invest a portion of membership contributions to build out rich media content that can be used on social media platforms. This included "commercial like" interviews with Alumni, Faculty and Students. In early 2020, the Academy allocated funds to hire a marketing intern to begin leveraging the developed content. The intern, Myers Turner, alongside the IEM Department Head, Sunderesh Heragu, meet weekly to set strategy including ad buys, platforms, review hit rates, and overall campaign effectiveness.

**Provide financial support -** The Academy will work in partnership with the OSU Foundation and the IEM department to identify specific needs of the department including: Professorships, Chairs, and Student Scholarships. The department has a goal of raising $20 MM and has raised $7 MM to date. The Academy will compliment the OSU Foundation outreach in a more targeted manner.

- In the past year, the Fundraising committee has been working under the leadership of Chair, Tom Britton to identify these needs, prioritize, build targeted teams, and get to work. The activity of fundraising can be a sensitive topic that must be handled deliberately and collaboratively with the OSU Foundation. In mid-October, the committee has reached the milestone of taking their many months of planning to action. As President of the Academy, I encourage each of you to consider your approach to "giving back" to an institution that prepared you for an amazing career. Our future lies in the hands of those to come and we can play a major role in their success!

**Enhance student career opportunities -** The Academy will work directly with students to provide insight, experience, and connections to Alumni to enhance each student's chance to be better prepared for their industry entrance. Additionally, providing these opportunities for students will improve employer satisfaction and in turn market credibility.

- In the past year, the Career Opportunities committee, led by Leva Swim, has been focused on building infrastructure in two areas of service. The first, a formal mentorship program allowing Alumni to conect directly one-on-one with students to provide an ongoing connection for students to leverage as they make the transition from student to working professional. The committee launched a "beta" version of the program in August 2020. Once improvements are made, a broader version will be launched. The second effort is a webinar series, recruiting Alumni who are subject matter experts to discuss specific topics and allow students to gain knowledge and direction. A quarterly schedule has been created and the first webinar occurred in October 2020.

**Foster a unique and beneficial partnership between the business community and OSU IEM -** The Academy will work with industry to develop opportunities for students to gain work experience while continuing to pursue their degree and to provide industry with talented engineering resources, both faculty and students, to address real world projects and problems. This "Center of Excellence" will provide students a connection into industry and allow them to refine their interests, and gain the experience necessary to hit the ground running upon workforce entry. The Center will provide companies access to engineering students who at minimal cost can apply their talents to address high value projects and lay the groundwork for connecting with these students in the recruitment process.

- In the past year, the Academy has been struggling with the scope of this effort. The "Center of Excellence" can be a wide reaching endeavor, trying to bring many invested parties together. The larger the scope, the more complex the effort. In the Fall of 2020, the Academy decided to curtail the scope of the effort to focus on a partnership with the OSU IEM school and regional business. Recently, a chairperson, Jon Womack (recent IAB Chair) has been appointed to refine the scope, and pull a committee together to devise a plan to begin the "Center of Excellence." We look forward to Jon's leadership and the new committee's perspective.

The Academy continues in service to the IEM department. We encourage all Alumni to be actively involved contributing whatever resources available. We are looking forward to the upcoming year!

In service to our Alma Mater,
Mitch Myers
*President, The Cowboy Academy of Industrial Engineering*

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Tom Britton
Bill Dueease
Laura Easley
Jack Goertz
Jeff Greer
Frank Groenteman
John Lewis
Mitch Myers
Leva Swim
Stacie Wrobbel

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Jack Goertz, ***President-Elect***
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Neal Buck
Denny Carreker
Kenneth Case
Geoff Clarke
Samuel Combs
Megan Crozier
Jerry Dechert
Johann Demmel
Bill Dueease
Laura Raiman DuPont
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Chad Frye
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US News and World Report has once again recognized the outstanding quality of IEM's programs.

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# Student Chapters

## The Institute of Industrial and Systems Engineers

The Institute of Industrial and Systems Engineers has had an extremely successful Fall semester! Our organization is a global association committed to connecting students and professionals in the Industrial and Systems Engineering field. Everything we do is centered around creating stronger connections between students and faculty in the School of Industrial Engineering and Management as well as facilitating networking opportunities across the industry and our region. Our mission is to further our IEM undergraduate and graduate students' success in the academic and professional worlds.

Although this semester was anything but ordinary, we were still able to host several webinar events and kick off a brand new mentorship program intended for younger IEM students. Additionally, the focus of this semester has been on preparing for the IISE South Central Regional Conference. Our IISE student chapter has the privilege of hosting this conference in the Spring of 2021. Another event to look forward to will be the Six Sigma Green Belt certification course. We are excited to bring this back as the turnout in the Spring of 2019 was exceptional. We are currently working on creating more IISE service opportunities and promoting general membership in the national IISE organization!

We would like to recognize the students who have worked so hard to make this organization so successful. The officers this academic year are:

- Brandon McKisick, President
- Amrit Chugani, Vice President
- Matthew Wilkinson, Conference Chair
- Marco Pina-Perez, Secretary
- Trent Slater, Treasurer
- Megan Mann, Merchandise Chair
- Bailey Hackler, Communications Chair
- Ben Burchard, Recruiting Chair
- Sam Koscelny, Fundraising Chair
- Matthew Edgeller, Social Chair
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- Chloe Jones, Website Chair
- Kaustuvi Thapa, Mentorship Chair
- Trent Darby, CEAT Student Council Rep

**Faculty Advisor:** Dr. Chenang Liu

If you would like more information about IISE or want to become a member, please email Brandon McKisick at brandon.mckisick@okstate.edu.

## APICS

APICS OSU student chapter aims to provide a training platform for new supply chain enthusiasts by creating a learning environment and building competencies on different supply chain operations and management topics. Our goal is to encourage certifications and provide networking opportunities such that it will create a bridge between academics and supply chain industrial work environment.

We are currently looking for new students interested in supply chain who can join our student chapter. In this way we hope to extend our horizon and build the supply chain community.

**Faculty Advisor:** Dr. Tieming Liu

## 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 and atmosphere to facilitate social interactions between students and faculty. Being a part of Alpha Pi Mu gives individual scholarship and volunteer opportunities. The society is open to juniors, seniors, and graduate students who meet the membership requirements.

Due to the strain of the pandemic, the organization was not able to hold the events that we normally do, such as volunteer activities in our community and an in-person initiation. This semester Alpha Pi Mu plans to initiate new members from both the Spring 2020 and Fall 2020 semesters through a virtual platform. We hope that in the spring and by next fall, the organization will be back in full swing and able to complete all the activities we normally do.

Maggie Goodin, President
Jackson Baker, Treasurer

**Faculty Advisor:** Dr. Manjunath Kamath

# Student Chapters

## INFORMS

The Institute for Operations Research and the Management Sciences (INFORMS) is the world's largest professional association dedicated to and promoting best practices and advances in operations research, management science, and analytics to improve operational processes, decision-making, and outcomes. The Oklahoma State University Student Chapter of INFORMS is a student-led campus organization focused on promoting student learning and professional advancement with fellow students and faculty within the field of operations research and 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. Due to COVID-19, INFORMS Student Chapter does not hold any in-person event during Fall semester and the only activity is a virtual gathering of graduate students.

The INFORMS student chapter advisor is **Dr. Juan Borrero** and the Fall 2020 student officers are:

Niloufar Daemi, President
Pouya Ahadi, Vice President and Treasurer

If you have any questions or would like to connect with the student chapter, please feel free to email Niloufar Daemi at niloufar.daemi@okstate.edu

## Evaluating Effectiveness of Information Visualizations Using Electroencephalography

**Dr. Joseph Nuamah**
Assistant Professor

*From:*
*1) Nuamah, J. K., Seong, Y., Jiang, S., Park, E., & Mountjoy, D. (2020). Evaluating effectiveness of information visualizations using cognitive fit theory: A neuroergonomics approach. Applied Ergonomics, 88, 103173.*

*2) Nuamah, J. K., & Mehta, R. K. (2020). Neuroergonomic Applications in Information Visualization. In Neuroergonomics (pp. 435-449). Springer, Cham.*

Advances in technology continue to change the way human operators interact with systems. Information visualizations (InfoVis) mediate many of these interactions by leveraging the working of human operators' visual system to aid decision making. Evaluating effectiveness of InfoVis, however, is not trivial. How do we know which InfoVis is optimal for a particular work environment?

Traditionally, subjective and performance measures have been used to evaluate Infovis effectiveness. On the one hand, the NASA Task Load Index (NASA-TLX) is widely used to measure perceived mental workload evoked by InfoVis. On the other hand, response time and accuracy are the most used performance measures to evaluate InfoVis effectiveness. These measures discount underlying biological content of behavior and are unable to explain the variability of human performance under conditions of stress and high workload (Nuamah et al, 2019). This is particularly critical for operators working under non-normal scenarios (e.g., emergency response) or for prolonged periods of time (e.g., drillers). It is therefore expedient to find other measurement techniques to complement traditional measures (Nuamah, & Mehta, 2020).

Functional neuroimaging techniques, including electroencephalography (EEG), allow researchers to monitor human operators' brain activities during interaction with systems. These techniques enhance understanding of the mechanisms underlying perceptual, cognitive, and motor functioning. The largest part of the brain, cerebral cortex, is divided into the frontal lobe associated with reasoning and problem solving, the parietal lobe –associated with integration of sensory information and spatial processing, the temporal lobe –associated with auditory processing, and the occipital lobe –associated with visual processing (Figure 1). By placing EEG electrodes on the scalp, with each electrode identified by a letter and a number to indicate associated lobe and brain hemisphere location respectively, spontaneous electrical activities of the brain can be measured.

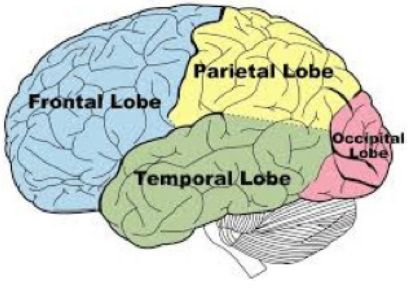


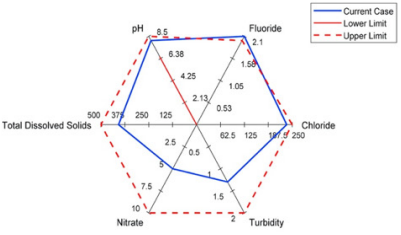

***Figure 1.*** *Cerebral cortex.*

EEG signals represent summed postsynaptic potentials of neurons firing a rate of milliseconds. Spectral power of EEG frequency bands (delta (< 4Hz), theta (4–8Hz), alpha (8–12Hz), beta (12–30Hz), and gamma (30–80Hz)) change in response to variations in task difficulty or mental effort. The EEG Task load index (TLI; Gevins & Smith, 2003) defined as the ratio of frontal theta power to parietal alpha power has been shown to increase with increasing mental effort (Nuamah & Seong, 2017).

The objective of the present study was to evaluate the effectiveness of two different InfoVis of the same data using EEG. We hypothesized that the better of the two InfoVis would evoke (1) lower perceived cognitive load measured by NASA TLX, (2) higher accuracy, (3) faster response time, and (4) lower objective mental workload measured by EEG TLI.

We simulated an online water quality monitoring task in which participants visualized water quality to ensure that no contaminant exceeded its maximum contaminant limit (MCL). Data from 6 sensors of a fictional automated water sampling station were presented in two formats: graphical format (see Figure 2a) and numerical format (Fig. 2b).

(a)




(b)

| Parameter | Value | Maximum Contaminant Level |
|---|---|---|
| Chloride | 334.1 | 250 |
| Fluoride | 1.7 | 2 |
| pH | 6.6 | 6.5 - 8.5 |
| Total Dissolved Solids | 425.1 | 500 |
| Nitrate | 6.3 | 10 |
| Turbidity | 1.0 | 2 |

***Figure 2.*** *Stimuli presented in (a) graphical format, and (b) numerical format.*

A within-subject experiment was designed in which 15 right-handed participants (25.9 ± 1.9 years, 10 men) were subjected to the two conditions. Each condition contained 4 blocks, with each block having 30 trials, making it a total of 120 trials per condition (Figure 3). EEG data were collected from participants while they judged water quality based on the presented InfoViz (Figure 4). Participants were instructed to press the left mouse button to indicate bad water quality when any of the parameters exceeded its MCL. They were instructed to press the right mouse button to indicate good water quality. The dependent variables were response accuracy, response time, TLI obtained from recorded EEG data, and perceived mental workload obtained using the NASA TLX questionnaire administered after each task.

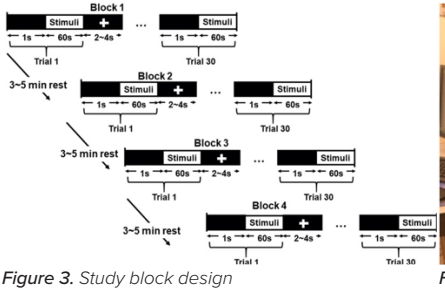



***Figure 3.*** *Study block design*

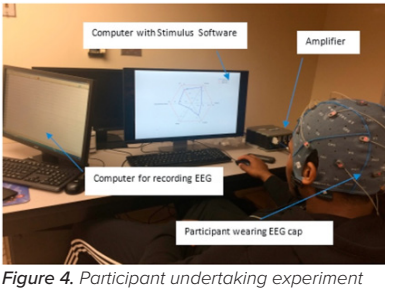



***Figure 4.*** *Participant undertaking experiment*

EEG data analysis was performed offline with MATLAB, EEGLAB, and custom code. Nonparametric Welch method was used to estimate the power spectrum in the frequency bands of interest. For each experimental condition, participants' TLI were computed as ratio of mean theta power at Fz to mean theta power at Pz. Statistical analyses were conducted in R version 3.4.1. Where normality was not violated, two-tailed paired t-tests were used to test for significant differences between conditions. Otherwise, two-tailed Wilcoxon signed-rank tests were used. Hedge's grm was used to estimate effect sizes for differences between dependent means.

Descriptive statistics (mean and standard deviations) of perceived mental workload, performance, and objective mental workload in both experimental conditions are provided in Table 1. Compared with the numerical format, the graphical format evoked lower perceived mental workload ($t(14) = 8.32$, $p = .02$, grm = 1.79), higher accuracy ($t(14) = 3.37$, $p < .02$, grm = 0.88), faster response time ($t(14) = 11.75$, $p < .001$, grm = 2.89), and lower objective mental workload ($t(14) = 6.43$, $p = .03$, grm = 0.86).

***Table 1.*** *Descriptive statistics of dependent measures.*

| Dependent Measure | | Experimental Condition | |
|---|---|---|---|
| | | Graphical Format | Numerical Format |
| Perceived mental workload | Global NASA-TLX score | 19.73 (8.75) | 26.27 (6.53) |
| Performance | Accuracy | 94.72 (4.36) | 91.28 (6.68) |
| | Response Time | 13.72 (11.62) | 44.60 (11.62) |
| Objective mental workload | EEG TLI | 0.35 (0.16) | 0.49 (0.13) |

The findings of this study suggest that the EEG TLI can be used along with subjective and performance assessments to determine which of two different visualizations of same data is better. Given that cognitive overload is a source of performance errors during human system interactions, system developers should examine and minimize the overall cognitive load associated with visualizations. Limitations of this study include the small sample size and the difficulty to apply EEG in practice. Future work will consider a larger sample size and explore other physiological monitoring techniques.

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# Research Grants

**Active in 2018-2020**

D. Brunson, **B. Balasundaram**, M. Borunda, C. Fennell, P. Hoyt, MRI: Acquisition of Shared High Performance Compute Cluster for Multidisciplinary Computational and Data-Intensive Research, National Science Foundation, 10/1/2015 - 9/30/2018, $951,570.

**B. Balasundaram**, **A. Buchanan**, and **S.S. Heragu**, FLAT: Freight Lane Assignment Tool, TreeHouse Foods, Inc., 1/13/2020–8/16/2020, $163,730.

**B. Balasundaram**, **A. Buchanan**, and **S.S. Heragu**, Optimization-Based Aggregate Master Planning Tools for Bay Valley Foods, LLC, Bay Valley Foods, LLC, 10/1/2017–1/31/2020, $250,599.

**J. Borrero** and L. Lozano, Modeling Worst-case Defender-Attacker Problems as Robust Linear Programs with Mixed-Integer Uncertainty Sets, Office of Naval Research, 05/01/19 - 02/30/22, $300,000.

**A. Buchanan**, CAREER: Parsimonius Models for Redistricting, National Science Foundation, 6/1/2020 – 5/31/2025, $500,000.

**A. Buchanan**, Imposing Connectivity Constraints in Large-Scale Network Problems, National Science Foundation, 6/15/2017 – 5/31/2020, $258,586.

**S.S. Heragu** and R. Wilson (PIs), The Conoco Phillips/OSU Data Analytics Collaboration, ConocoPhillips, 7/1/19 - 6/30/25 $675,000.

R. Taylor, J. Stewart, and **S.S. Heragu**, New Product Development Center, Economic Development Administration, 10/8/2020-10/7/2023, $1,000,000.

**M. Kamath**, **F. Yousefian**, and S. Frazier, Flow Visualization and Risk Assessment of Hazardous Material Movement in Oklahoma, Oklahoma Department of Emergency Management, 10/1/2017–9/31/2018, $119,985.

**M. Kamath**, **F. Yousefian**, and S. Frazier, Development of a GIS Application for Analyzing HazMat Flows in Oklahoma, Oklahoma Department of Emergency Management, 10/1/2018 - 9/31/2019, $131,620.

**M. Kamath**, **F. Yousefian**, and S. Frazier, Using HazMat Flow Analyzer and Risk Assessment Tools to Support Emerency Resource Planning and HazMat Training Activities in Oklahoma, Oklahoma Department of Emergency Management, 10/1/2019 - 9/31/2020, $131,341.

**M. Kamath, F. Yousefian,** and S. Frazier, Phase VI: An Integrated GIS Application for HazMat Flow Analysis and Risk Assessment to Support Local Emergency Planning and Preparedness in Oklahoma, 10/1/2020-9/30/2021, $118,110.

**W. Kolarik**, Industrial Assessment Center Program, U.S. Department of Energy, 9/1/2016 - 9/31/2021, $1,500,000.

**T. Liu**, W. Paiva and Ye Liang. “Validating a clinical decision support algorithm developed with big data to diagnose, state, prevent, and monitor a patient’s diabetic retinopathy,” OCAST, 8/1/2018 - 7/31/2021, $90,000.

**T. Liu** and C. Zhao, “Studying the Impacts of Freight Consolidation and Truck Sharing on Freight Mobility”, Transportation Consortium of South Central States (TranSET), 5/1/2017 - 10/31/2018, $55,000.

**F. Yousefian**, “CAREER: Advancing Mathematical Models and Algorithms for Decentralized Optimization in Complex Multi-agent Networks”, National Science Foundation, 3/1/2020 – 2/28/2025, $500,000.

## Journal Publications

**Papers published or accepted in 2018-2020**

Z. Miao and **B. Balasundaram**. An ellipsoidal bounding scheme for the quasi-clique number of a graph. *INFORMS Journal on Computing*, 32(3):763–778, August 2020.

F. Nasirian, F. M. Pajouh, and **B. Balasundaram**. Detecting a most closeness-central clique in complex networks. *European Journal of Operational Research*. 283(2):461-475, June 2020.

B. Farmanesh, A. Pourhabib, **B. Balasundaram**, and **A. Buchanan**. A Bayesian framework for functional calibration of expensive computational models through nonisometric matching. *IISE Transactions*, May 2020. https://doi.org/10.1080/24725854.2020.1774688.

J. Ma and **B. Balasundaram**. On the chance-constrained minimum spanning k-core problem. *Journal of Global Optimization*, 74(4):783-801, August 2019.

S. Sun, Z. Miao, B. Ratcliffe, P. Campbell, B. Pasch, Y. A. El-Kassaby, **B. Balasundaram**, and C. Chen. SNP variable selection by generalized graph domination. *PLOS ONE,* 14(1):1–18, January 2019.

Y. Lu, E. Moradi, and **B. Balasundaram**. Correction to: Finding a maximum k-club using the k-clique formulation and canonical hypercube cuts. *Optimization Letters*, 12(8):1959–1969, November 2018.

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**J.S. Borrero**, L. Lozano, "Modeling Defender-Attacker Problems as Robust Linear Programs with Mixed-integer Uncertainty Sets," *INFORMS Journal on Computing* (2020). Forthcoming.

**J.S. Borrero**, O.A. Prokopyev, P. Krokhmal, Optimization of cascading processes in arbitrary networks with stochastic interactions. *IEEE Transactions on Network Science and Engineering*. Accepted for Publication.

**J.S. Borrero**, O.A. Prokopyev, D. Saure, Sequential interdiction with incomplete information and learning. Operations Research, 67(1): 72-89, 2019.

V. Stozhkov, **A. Buchanan**, S. Butenko, V. Boginski. Continuous cubic formulations for cluster detection problems in networks. *Mathematical Programming*. Accepted for Publication.

H. Salemi and **A. Buchanan**. Parsimonius formulations for low-diameter clusters. *Mathematical Programming Computation*. Accepted for Publication.

H. Validi, **A. Buchanan**. The optimal design of low-latency virtual backbones. *INFORMS Journal on Computing.* Accepted for Publication.

H. Validi, **A. Buchanan**. A Note on "A linear-size zero-one programming model for the minimum spanning tree problem in planar graphs". *Networks*, 73(1): 135-142, 2019.

J.L. Walteros, **A. Buchanan**. Why is maximum clique often easy in practice? *Operations Research*. Accepted for Publication. Honorable Mention in the 2019 JFIG Paper Competition.

**A. Buchanan**, Y. Wang, S. Butenko. Algorithms for node-weighted Steiner tree and maximum-weight connected subgraph. *Networks*, 72(2): 238-248, 2018.

T. van de Kracht and **S.S. Heragu**, "Lessons from Modeling and Running the World's Largest Drive-Through, Mass Vaccination Clinic," *INFORMS Journal of Applied Analytics*, to appear, 2021.

F. Majzoubi, L. Bai and **S.S. Heragu**. The EMS vehicle transportation problem during a demand surge. *Journal of Global Optimization*, to appear, 2021.

O. Battaia, A. Dolgui, **S.S. Heragu**, S.M. Meerkov, and M. K. Tiwari, Design for manufacturing and assembly/disassembly: joint design of products and production systems, *International Journal of Production Research*, 56(24): 7181-7189, 2018.

**K. A. Jurewicz**, D. M. Neyens, K. Catchpole, A. Joseph, S. T. Reeves, J. H. Abernathy III. An observational study of anaesthesia workflow to evaluate physical workspace design and layout. *British Journal of Anesthesia*. Accepted, 2020.

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Srivathsan, S. and **M. Kamath**, Understanding the value of upstream inventory information sharing in supply chain networks, *Applied Mathematical Modelling*, 54:393-412, 2018.

J. Ma, Y.T. Leung, and **M. Kamath**, 2019, Service system design under uncertainty: Insights from an M/G/1 model, *Service Science*. 11(1):40-56, 2019.

Z. Shi, C. Kan, W. Tian, and **C. Liu**, A Blockchain-based G-code Protection Approach for Cyber-Physical Security in Additive Manufacturing. *ASME Journal of Computing and Information Science in Engineering*, 2020, Accepted for Publication.

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R. K. Mehta, & **J. K. Nuamah**. Relationship Between Acute Physical Fatigue and Cognitive Function During Orthostatic Challenge in Men and Women: A Neuroergonomics Investigation. *Human Factors*, 0018720820936794, 2020.

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# Fall 2020 Senior Design Teams

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 in the manufacturing and service sectors. The projects provide students the opportunity to apply the theories and tools they have learned to provide clients with innovative solutions to a problem.

**OnCue Express Team:**

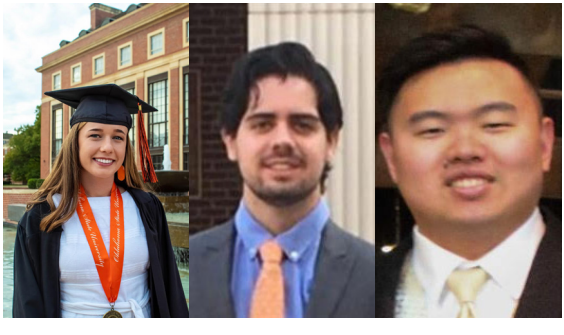
Susan Weckler
Kaitlyn Close
Vince Humerickhouse

This design team is using simulation tools to evaluate alternatives to increase production of tacos for the OnCue Express production facility by 400%.

**AstraZeneca Team:**

Jake Ward
Jax Silva
Robert Hammersmith
Robby Cabello

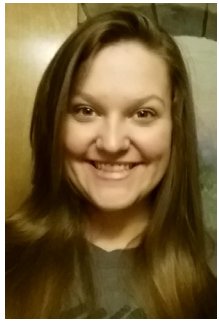
This design team is working to develop a planning tool that will help health clinics host an efficient drive-thru influenza vaccination clinic.



**Webco Team:**

Cassie Johnson
Iker Larraza
Lefu Liu

This design team is using simulation modeling, facility layout techniques, and cost analysis to efficiently design a layout for Webco's new facility.



**Hannah Walters**

Hannah was part of a CEAT interdisciplinary design team called "Wind Turbine Blade Repurposing."

**Taylor Boyd**

Taylor was part of a CEAT interdisciplinary design team called "Adaptive Kitchen Cabinet."

# IEM Faculty and Staff

## Faculty

### IEM Administration

Sunderesh Heragu, Ph.D.
*Regents Professor, Head, and Humphreys Chair*

Tieming Liu, Ph.D.
*IEM Graduate Program Director*
*Associate Professor*

### IEM Tenured/Tenure-Track Faculty

Baski Balasundaram, Ph.D.
*Wilson Bentley Professor*

Juan Borrero, Ph.D.
*Assistant Professor*

Austin Buchanan, Ph.D.
*Assistant Professor*

Terry Collins, Ph.D., P.E.
*Associate Professor*

Katie Jurewicz, Ph.D.
*Assistant Professor*

Manjunath Kamath, Ph.D.
*Professor*

Chenang Liu, Ph.D.
*Assistant Professor*

Joseph Nuamah, Ph.D.
*Assistant Professor*

Bing Yao, Ph.D.
*Assistant Professor*

Farzad Yousefian, Ph.D.
*Assistant Professor*

### IEM Adjunct/Non-Tenure Track Faculty

Jennifer Glenn, Ph.D.
*Teaching Assistant Professor*

Tim Hardin, Ph.D., P.E.
*Teaching Assistant Professor*

Ying Tat Leung, Ph.D.
*Adjunct Researcher*

## Staff

Laura Brown
*Administrative Assistant/Senior Financial Assistant*

Mya Jackson
*Student Worker*

Valerie Quirey
*Graduate Programs Coordinator*

Matt Taylor
*Undergraduate Advisor*

Myers Turner
*Marketing Intern*

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