Industrial Engineering
Newsletter Fall 2024

OPTIMUM

ENGINEERED FOR
WHAT'S NEXT.

Cullen College of Engineering
UNIVERSITY OF HOUSTON

Letter from the Chair

Dear Colleagues,

Greetings and I hope that the fall semester has treated you well! I am proud to share some of the highlights and exciting accomplishments we have accomplished over the last six months. We recruited high-caliber faculty, significantly enhanced two new programs (B.S. degree in Systems Engineering and Master's degree in Engineering Management) and connected with outstanding alumni. I encourage you to reach out and visit our department when able, we are always seeking new and exciting partnerships.

Warm Regards,

Gino J. Lim, Ph.D.
R. Larry and Gerlene (Gerri) R. Snider Endowed Chair in Industrial Engineering
Cullen College of Engineering
University of Houston

UH IE **BY THE NUMBERS**

ENROLLMENT
(FALL 2023)

155 UNDERGRADUATE STUDENTS

213 GRADUATE STUDENTS

DEGREES AWARDED
(FY 2023)

38 B.S.

130 M.S.

4 PH.D.

UH IE DEPARTMENT WELCOMES 3RD NSF CAREER AWARD WINNER TO FACULTY RANKS

The Cullen College of Engineering welcomes associate professor **George Tan** to its faculty ranks for the 2024-25 academic year as part of his joint appointment in the Tilman J. Fertitta Family College of Medicine. Tan joins UH from Texas Tech University, where he served as an assistant professor in the Industrial, Manufacturing & Systems Engineering department.

He is the third faculty member in the UH IE Department to win the prestigious NSF Faculty Early CAREER Award. His award-winning project, titled "Capillary-Incorporated Bioprinting of Biomimetic Soft Tissue Constructs," aims to develop a novel 3D bioprinting system for creating large human tissues embedded with artificial capillary vessels to enhance cell viability. This innovative work offers the potential to develop replacement tissues for transplants, reducing reliance on donor organs and mitigating transplant rejection.

"The IE department is making astounding advances. Joining the IE department as a Presidential Frontier Faculty is a thrilling opportunity for me to leverage the best of the Cullen College of Engineering and the Tilman J. Fertitta Family College of Medicine. I am excited to be part of such a forward-thinking and dynamic team, and ready to foster interdisciplinary collaboration between advanced manufacturing and healthcare," said Tan.

Tan earned his Ph.D. in industrial engineering from North Carolina State University in 2015. His research focuses on advanced manufacturing processes for biomedicine, including electrospinning, hybrid bioprinting and direct-write photolithography. He also leads an NSF-sponsored education project focused on transformative pedagogical strategies for biomedical innovation, aiming to catalyze interdisciplinary collaboration between engineering and medical students.

Pictured: George Tan

UH IE GRADUATE PROGRAM RANKED IN TOP 50 BY U.S. NEWS & WOLRD REPORT

INDUSTRIAL ENGINEERING

The Industrial Engineering graduate program at the University of Houston's Cullen College of Engineering was named a top 50 progam in the latest annual rankings edition of U.S. News & World Report.

Overall, the Cullen College of Engineering was rated as the No. 69 graduate school in the nation. As of Fall 2022, the Cullen College of Engineering had about 3,266 undergraduate students enrolled, as well as 1,044 students pursuing Masters' degrees, and 558 doctoral students. The College awarded 569 undergraduate degrees, 212 Master's degrees and 101 doctorates in FY 2022.

NEW

FACULTY

NIRATHI GOVINDU

Nirathi Govindu joins the Cullen College this Fall as a lecturer in the Industrial Engineering Department. Govindu earned a doctorate in Industrial Engineering in 2013 from Mississippi State University. Before joining the Industrial Engineering Department at UH, Govindu was a data analyst at NRG Energy. Govindu's research interests focus on using machine learning applications in health sciences and utilizing AI for project planning and design.

NEW

FACULTY

GEORGE TAN

George Tan joins the Cullen College as an Associate Professor in the Industrial Engineering department. Tan comes to UH from Texas Tech University and joins the Industrial Engineering Department as an Associate Professor. His research interests are micro- and nanofabrication for tissue engineering, Biomedical design and instrumentation, and Biomimetic polymer structures. Tan earned an NSF CAREER Award earlier this year for his work to develop a novel 3D bioprinting system for creating large human tissues.

UH IE PROFESSOR WINS BEST PAPER COMPETITION

Dr. Na Zou was recently recognized with the Best Paper Award in a competition associated with the 2024 Institute for Operations Research and the Management Sciences (INFORMS) Conference on Quality, Statistics, and Reliability (ICQSR) — described by Zou as "a major research community."

The paper, CODA: Temporal Domain Generalization via Concept Drift Simulator, was co-authored by Zou and her research partners at Rice University and Texas A&M University: Chia-Yuan Chang, Yu-Neng Chuang, Zhimeng Jiang, Kwei-Herng Lai, and Anxiao Jiang. Funding for the project came from an NSF award earlier this year; the total $1.2 million award is split across the three collaborating institutions.

"In real-world applications, machine learning models often become obsolete due to shifts in the joint distribution arising from underlying temporal trends, a phenomenon known as the 'temporal concept drift'," assert Zou et al. in the paper's abstract.

With machine learning currently at the forefront of innumerable innovative efforts, investigating solutions for issues such as concept drift is critical work.

This method is the COncept Drift simulAtor (CODA) framework: a way to simulate future data with potential changes that machine learning models may face before they actually face them. Compared to model-centric modeling, a data-centric approach is critical because it addresses underlying data quality and distribution issues and can significantly enhance model performance and generalization, leading to more reliable, robust and effective solutions for real-world applications.

Pictured: Na Zou

FENG, LIN ARE USING AMI GRANT FOR SUPERCONDUCTOR MANUFACTURING REFINEMENT

A pair of professors from the Industrial Engineering Department at the Cullen College of Engineering are using a grant from the University of Houston's Advanced Manufacturing Institute (AMI) to investigate using machine learning to improve the manufacturing of superconductors.

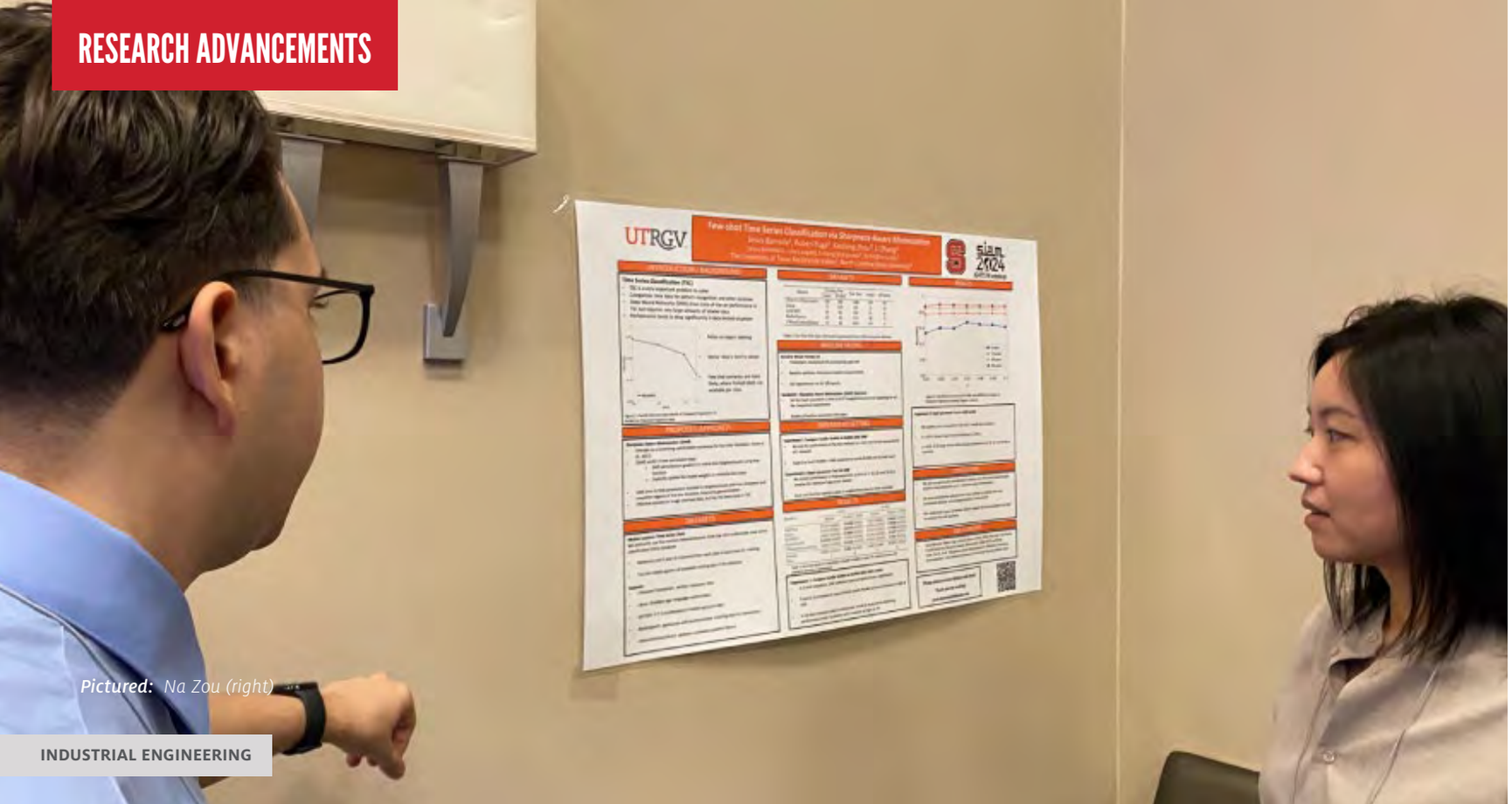
"Machine Learning-based Process-Structure-Property (PSP) Modeling and Monitoring for Superconductor Manufacturing" is funded for $35,000. The AMI supports the transition of lab-scale technology to fully-fledged manufactured products for the market, and addresses manufacturing challenges by creating solutions in manufacturing R&D.

Qianmei (May) Feng – a professor, Brij and Sunita Agrawal Faculty Fellow and a Graduate Program Director in the Industrial Engineering Department – is the co- PI for the project.

Ying Lin, the lead PI an associate professor in the Industrial Engineering Department. Lin is also the director of the Smart Health & Intelligent Engineering Systems (SHINES) Lab.

According to an abstract for the project, their research is focused improving the manufacturing process for high-temperature superconductors (HTS). The research was started earlier this year, and will continue through the end of the year. The grant continues earlier research that the pair also received AMI funding for.

Pictured: L: Qianmei (May) Feng, R: Ying Lin



Pictured: *Na Zou (right)*

IE'S ZOU AIMS TO **IMPROVE HEALTHCARE WEARABLES VIA DEEP LEARNING**

Assistant professor of industrial engineering at the University of Houston **Na Zou,** has received $169,982 of a collaborative research award from the National Science Foundation (NSF) Computer and Information Science and Engineering Minority Serving Institution (CISE-MSI) Research Expansion program. Other collaborating institutions on the $600,000 project are North Carolina State University and The University of Texas Rio Grande Valley.

"The main goal of this project is to make time-series deep learning models more reliable by systematically addressing spurious correlations leading to output decisions."

The project consists of three objectives: identifying common patterns and understanding why these can be misleading, developing methods for pinpointing which parts of a model contribute to these misleading patterns and how to correct them, and applying the resulting innovative solutions to two medical applications: monitoring Parkinson's disease and detecting falls in the elderly.

This research will further yield open-source tools and "potentially benefit a wide range of sensor-based medical monitoring and diagnosis tasks."

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Students can take an online 30-credit hour master's in Engineering Management through the University of Houston's new UH Extend initiative. UH Extend is designed for students seeking fully online degree and certificate programs that are both convenient and affordable.

Engineering Management (EM) bridges the gap between engineering and technological problem-solving abilities of engineers with administrative skills for leading the day to day operations of today's complex organizations within the current global economy. The scope of EM includes engineering principles, business functions and advanced technologies.

STUDENT

SUCCESS

Suhaib Kaissi is certainly investing in himself. After earning his BS and MBA, he returned to academia to complete a postgraduate program focusing on artificial intelligence through the University of Texas at Austin and is now pursuing his second master's degree in SCLT. He also serves as a board member at the UH Energy Coalition student organization and has taken a leading role in the 2025 Port of the Future conference, which will host more than 57 global ports at the Hilton University of Houston.

STUDENT

ORGANIZATIONS

The UH Institute of Industrial and Systems Engineers has been awarded the Gold Chapter Award for the third straight year. The award is the highest honor in the IISE University Chapter Recognition Program. The president for the preceding academic year was **Abdulrahman Aljahmi**. “I am proud to see my vision turn into reality. We’ve achieved the goals we set forth and put great ideas into action.” The chapter saw a 284% increase in event turnout this year, with participation from “nearly every IE student in the department.” Aljahmi worked to make a “personal connection” with as many attendees as possible.

STUDENT

SUCCESS

ABDULRAHMAN ALJAHMI

As **Abdulrahman Aljahmi** prepares to graduate this December, he took a moment with us to reflect on his time in the Cullen College of Engineering – his personal and professional accomplishments, his pursuit of academic success as a transfer student, and how his world-class engineering education at UH has prepared him for the future.

"I take pride in my academic performance and the knowledge I've gained, which has prepared me for the next stage of my career," he added. "The coursework at UH has provided me with a foundation in critical thinking, technical skills, and problem-solving, all of which are essential for any career.

STUDENT

SUCCESS

WESLEY BENNETT

Wesley Bennett currently pursuing his master's degree in engineering management, has refused to allow setbacks to keep him from finding success in the Cullen College of Engineering – even if it took a bit longer than he expected.

Bennett's professional experience was assessed in lieu of some of the academic prerequisites for the program, which allowed him to leverage real-world skills and insight toward his acceptance into the program.

UH IE ALUM JOINS ISE DEPARTMENT AT TAMU

Nancy Currie-Gregg (Ph.D. '97) has joined the Industrial & Systems Engineering Department at Texas A&M University as a professor of practice for the 2024-25 academic year. Currie-Gregg earned her doctorate in industrial engineering from the University of Houston Cullen College of Engineering in 1997 while working at NASA, where she was involved in four space shuttle missions: STS-57 (Endeavor), STS-70 (Discovery), STS-88 (Endeavor), and STS-109 (Columbia).

Currie-Gregg achieved the rank of colonel in the U.S. Army before retiring in 2005, and she has logged more than 4,000 hours of flight time in a variety of rotary-wing and fixed-wing aircraft.

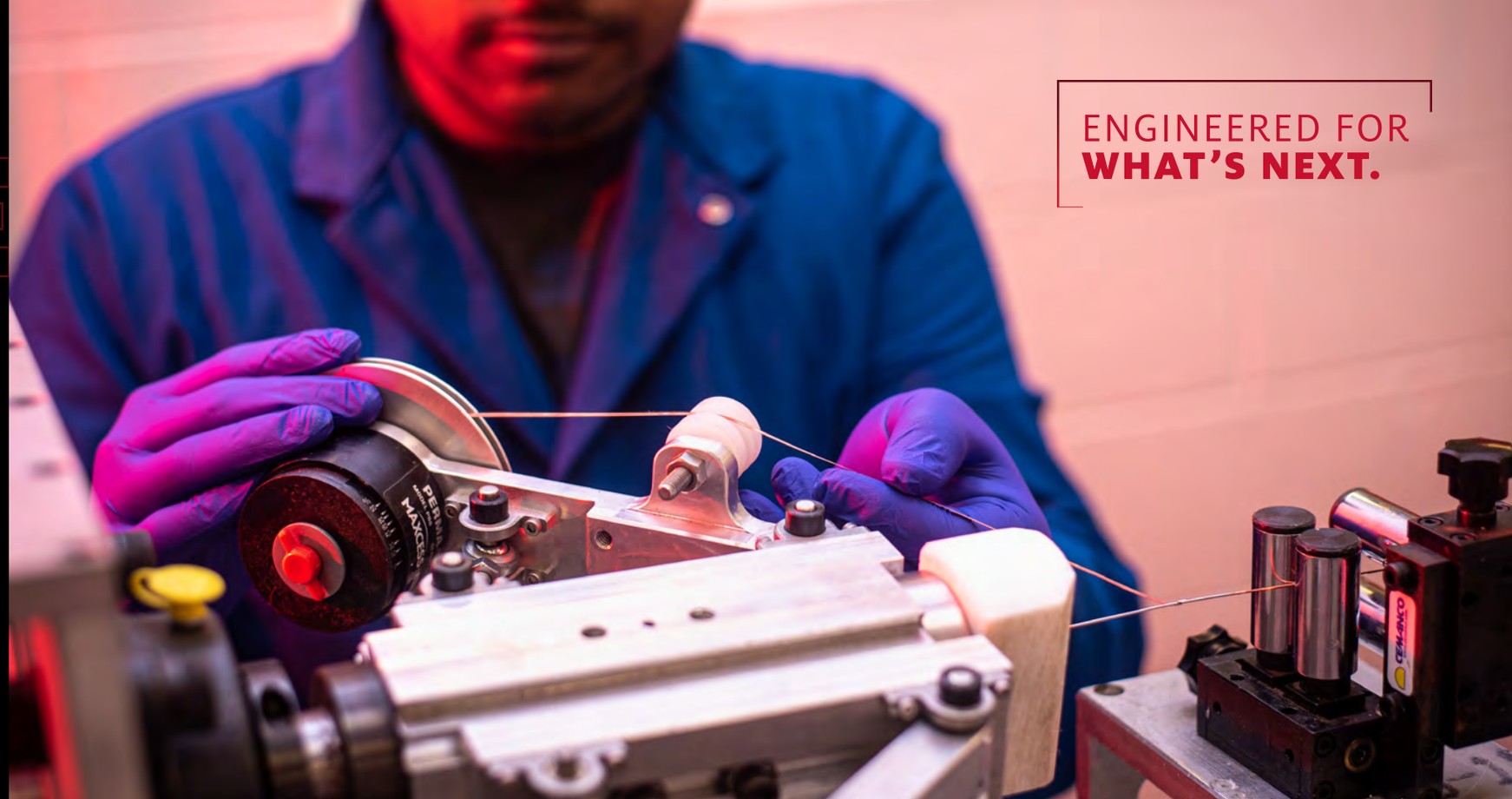
Her research interests include human factors engineering, automated systems and artificial intelligence. Her expertise in space robotic systems operations has contributed to the development and analysis of human-robotic systems interfaces for advanced space systems, and in 2020, the Cullen College recognized Currie-Gregg's contributions to the engineering industry with the Distinguished Engineering Alumni Award.

Currie-Gregg also serves as a principal engineer in the NASA Engineering and Safety Center (NESC), Director of the Texas A&M Space Institute and an adjunct associate professor at North Carolina State.

Pictured: Nancy Currie-Gregg

The University of Houston
Cullen College of Engineering

The University of Houston Cullen College of Engineering addresses key challenges in energy, healthcare, infrastructure, and the environment by conducting cutting-edge research and graduating hundreds of world-class engineers each year. With research expenditures topping $40 million and increasing each year, we continue to follow our tradition of excellence in spearheading research that has a real, direct impact in the Houston region and beyond.



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