



Department of Industrial &
Systems Engineering
Cullen College of Engineering

OPTIMUM INDUSTRIAL & SYSTEMS ENGINEERING

RECENTLY ESTABLISHED UH TMAC HELPS DS IMPORTS NAVIGATE COMPLIANCE FOR DEFENSE CONTRACT SUCCESS

Thanks to valuable input from the University of Houston's Texas Manufacturing Assistance Center (TMAC) program, Galveston's DS Imports LLC has increased its revenue by 10 percent and has begun expanding its manufacturing in the state.

DS Imports LLC., headquartered in Galveston, is a Texas-based company founded in 1985 with roots in eco-conscious textiles. Beginning with "Khadi," a traditional Indian hand-spun and hand-woven cotton fabric crafted by small weavers using vegetable dyes and hand blocks, sustainability has been at the heart of the company's mission from the start.

Recognized as a trusted source for sustainable packaging solutions made from recycled paper — such as disposable tableware, restaurant supplies, medical consumable packaging and carry bags — the company remains dedicated to reducing its carbon footprint by replacing single-use plastics with compostable and recyclable alternatives.

As part of its growth strategy, DS Imports aimed to provide support to the U.S. Navy's Submarine Fendering Systems, a highly specialized and mission-critical program. The company needed to demonstrate strict compliance with federal regulations, namely the DFARS 252.225-7000 Buy American — Balance of Payments Program Certificate. This certification ensures that supplied products are domestically sourced and manufactured, aligning with national security and acquisition objectives.

To address these challenges, DS Imports partnered with the University of Houston's TMAC program. The TMAC program officially began operations at UH on Sept. 1, and soon after its launch, UH Gulf Coast TMAC was already demonstrating impact by helping regional manufacturers achieve measurable results. ⚙️



UNDERGRAD REAGAN KIMBERLY TWICE-NAMED “OUTSTANDING JUNIOR”

Cullen College of Engineering’s most recent Outstanding Junior, industrial engineering undergraduate **Reagan Kimberly**, sees the power in being not only a successful woman in engineering, but in being exactly where she’s meant to be.

Kimberly first enrolled as a mechanical engineering student but shortly changed her major to industrial engineering once the opportunity arose.

“I didn’t feel like I was in the right major at that point — it just didn’t feel like the thing that I wanted to do for the rest of my life, and that’s okay,” she said. “I felt like IE was just my home, you know? I love looking at systems from a broader point of view, and I’m a big math person, too. Industrial engineering has a lot of math, which is nice, as well as a lot of pathways I can grow into later.”

Kimberly was recently honored with the Outstanding Junior award for both the industrial engineering department and the college overall, by which she said she was “blown away.”

“I didn’t think that was possible, and I think it’s really cool to be a woman in industrial engineering and being able to accomplish all of these things. I think it’s really powerful. I also think it’s pretty great for an industrial engineer to get that award, because we’re a smaller major, so I’m happy to be representing my department in that way,” said Kimberly. ⚙️

Reagan Kimberly
Junior, Undergraduate student



UH DEGREE KEY TO CAREER, WIFE, HAPPY LIFE FOR GIBSON

When Jim Gibson started studying at the University of Houston for his Industrial Engineering degree in 1962, he did it while also working for the Texas Highway Department doing drafting, surveying and construction inspection.

He was commuting at night to do it, about 50 minutes south from Conroe to Houston, on the then two-lane Highway 75. It was in a summer school English class at UH that he met his wife of 63 years. Their time together has included three children, seven grandchildren and life in Houston, Dallas and Abilene, plus traveling the world together.

Gibson decided on Industrial Engineering because of the diversity and challenges it offered.

After graduating in 1966, he saw the impact of legislation on manufacturing. The passage and implementation of the Clean Air Act in 1963, as well as the Clean Water Act that expanded in 1972, and Occupational Safety and Health Act of 1970, led to many opportunities for him to put his UH degree to work.

“I liked Industrial Engineering because there were always challenges requiring multiple solutions,” he stated. “Solving one large problem led to smaller problems, each one an added challenge.”

Gibson provided an example of one of those cascading solutions.

“The EPA had come out with exhaust stack regulations. One of the plants, that was a division of the parent company, manufactured automobile condenser coils for air conditioners. They had some external pollution that didn’t comply with the Clean Air Act. At that time we could not find equipment that would solve our air emission problem. My team and I experimented with different types of filtering, like flooding the stack with water mist, and electrostatic filters. We finally got a centrifugal water separator that worked well solving the exhaust problem. However, we were then faced with finding a solution for the solid and liquid waste.” ⚙️

Jim Gibson
ISE Graduate



SHI, WANG MAP A PATH TO US MINERAL SOVEREIGNTY THROUGH E-WASTE

Inside America's junk drawers sits an untapped fortune, and a national and economic security solution. As the global race for critical minerals intensifies, University of Houston researchers have unveiled a breakthrough supply chain model designed to transform e-waste from a mounting environmental hazard into a stable, domestic engine for the U.S. economy.

By solving the financial "missing link" that has long made large-scale recycling a losing bet for private industry, Professor **Jian Shi** and his team are providing the roadmap for a new era of "urban mining." The research, co-authored by Professor **Kailai Wang** and Graduate Researcher **Chuyue Wang**, offers a strategic framework to reclaim the gold, lithium, and cobalt buried in discarded electronics, keeping these essential materials circulating within the U.S. instead of ending up in foreign landfills.

"A lot of people have iPads or old iPhones sitting in their drawers right now, and that's a waste of a critical resource," said Shi, an Associate Professor of Electrical

Power Engineering Technology in the Engineering Technology Department. "Urban mining allows us to extract the same high-value materials found in traditional mines without the environmental destruction. More importantly, it helps secure our domestic supply chain for the technologies of tomorrow."

E-waste is currently the fastest-growing solid waste stream in the world, Shi's research found. When left unmanaged, these devices represent a triple threat: they leak hazardous waste, pose significant fire risks due to aging batteries, and — perhaps most critically — represent a massive loss of "critical mineral sovereignty" for the United States.

The primary barrier to universal recycling hasn't been a lack of will, but a lack of profit. The current ecosystem is a fragmented web of manufacturers, independent collectors, and material recovery firms that often work at cross-purposes. ⚙️



Left to Right: Jian Shi, Professor, Chuyue Wang, Graduate Researcher, Kailai Wang, Professor

CLEAN WATER IN ECUADOR PROJECT EARNS AUDIENCE AWARD AT NAE GRAND CHALLENGES SUMMIT & CREATE@UH SHOWCASE

A passionate interest in their chosen topic and a range of engineering knowledge were the keys to success for the team of five that took home the audience award for the Fall 2025 UH NAE Grand Challenges Summit & Create@UH Showcase.

“Accessing Clean Water in Guayaquil, Ecuador” was chosen by the audience as the most impressive poster presentation, from a pool of more than 70 projects. Advised by **Alex Landon**, a professor of practice and the director of the Cullen Honors Program, the team members were:

- Mia Torres — Civil Engineering
- Keira Schnittke — Biomedical Engineering
- Kamia Gordon — Computer Engineering
- Hao/Sam Trinh — Industrial Engineering
- Kaitlyn Philip — Biomedical Engineering

Torres described it as a mix of emotions to learn that they had won.

“When I found out that we had been selected as the winning group, I was genuinely surprised,” she said. “There were many strong projects, including one focused on vaccines that involved creating an app to track vaccination rates in different areas. Because of that, the experience was somewhat bittersweet. It was difficult to see so many impressive projects not win, but at the same time, we were very proud of our work. We had put a lot of effort into the project and genuinely believed the solution was viable and could realistically be applied.”

The goal of the group was to examine the issue of contaminated water in Guayaquil, a port city of more than 2.7 million in Ecuador. According to their poster project, rapid urban growth has outpaced the development of the sewer system, leading to about 75 percent of sewage being released untreated.

“We ended up choosing Guayaquil, because while the city has access to water, much of it is not clean or drinkable,” she said. “We were intentionally looking at places that already had water but lacked safe access to it.” 🌱



Left to Right: Kaitlyn Philip, Kamia Gordon

APPRECIATING THEORY: XIN JIANG'S RESEARCH INTO OPTIMIZATION

Xin Jiang, an assistant professor in the Cullen College of Engineering's Industrial and Systems Engineering (ISE) department, is driven by the rigor and utility of mathematical optimization. Though his background is electrical engineering, his work today in ISE leans more toward the theoretical in a way that helps him to bridge abstract mathematics with real-world applications.

"My research focuses on mathematical optimization," Jiang said. "Optimization is really about increasing the efficacy of a given goal subject to certain constraints, and I design new patterns for communication and customized algorithms to fix the challenges in these new distribution scenarios. I'm especially drawn to what I call 'practical theory': spotting the distinctive structure of real-world problems and leveraging it to develop methods that are both theoretically grounded and demonstrably effective."

One recent example is distributed optimization, which essentially allows multiple computing devices, or agents, to tackle a problem together, with each device running its own piece of the necessary work to reach the solution.

This is an alternative to attempting to solve an algorithmic optimization problem solely through use of a more powerful computer, which may be less cost-effective or perhaps not an option at all.

This approach is especially timely given the impact that recent developments in artificial intelligence have had on computer hardware supplies. Modern AI development depends on both large-scale data and coordinated, high-performance computation infrastructure, so as demand from AI data centers dominates existing and potentially future supplies of RAM and GPU components, distributed approaches may become more necessary than ever before.

"Nowadays, the scale of data is exploding beyond expectations. Due to production times, it's difficult for hardware like GPUs and memory units to meet the urgent needs of the explosion of big data," said Jiang. "To me, that means the only remedy is to distribute it. ⚙️"

Xin Jiang

Assistant Professor



STUDENT SUCCESS

SCLT COUGARS TAKE TOP THREE STUDENT PRIZES AT BREAKBULK AMERICAS 2025

Student teams from the Cullen College of Engineering's Supply Chain and Logistics Technology Program recently took first, second and third place in the student research poster competition at this year's Breakbulk Americas conference in Houston, Texas.

Breakbulk Americas is the largest shipping and logistics trade show and conference of its kind in the US and one of the largest in the world. Student teams from area colleges and universities are invited to attend and participate in opportunities specifically geared towards their education and emerging careers, and this year's student research poster contest entries numbered 35 unique submissions.

First prize was awarded to "Port & Profit: The Economy Imperative of Zero Emission Ports" by undergraduates Cindy Becerra, Elieser Catellanos and Mariela Juarez, and included an award of \$2,000.

"It was an incredible experience presenting our research on the economic and environmental case for zero-emission ports," said Becerra. "We learned so much and were honored to share our work with industry leaders. Events like these truly fuel our passion for innovation. Thank you for giving us the opportunity to learn, share, and grow." 🛠️



Reagan Kimberly
Junior, Undergraduate student

CULLEN

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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