The Pursuit of Human Agency in the Era of AI

IC² Institute

The University of Texas at Austin
Office of the Vice President for Research,
Scholarship and Creative Endeavors

Director's Message

Our work this past year spans a broad portfolio, with an ongoing focus on artificial intelligence. In our conversations about AI with stakeholders, one concern surges forward: As AI encroaches upon the things that make humans human, such as the ability to express empathy and think critically, the need for humans will steadily decline. This takes on special significance in health care, with concerns about AI diminishing the need for human practitioners and their capacity for expert clinical judgement. But three projects we launched this year make a compelling case for humans in an AI-augmented society.

In collaboration with Dell Medical School, we funded four teams, each devoted to understanding and mitigating the risks of using algorithmic models to support clinical decision-making. These projects underscore the need for clinicians to understand the social, technical, clinical and ethical aspects of AI in health care. We also released a strategy paper commissioned by the Episcopal Health Foundation, that considers Health AI from the perspective of safety-net providers, a segment of the health care workforce that develops unique expertise as they work with uninsured and underinsured populations. Finally, we conducted in-depth interviews with clinicians who are integrating AI into their clinical reasoning. This project identifies the nuanced ways clinicians use AI to deepen, rather than diminish, their cognitive engagement.

As we continue to develop this work, we will be looking for research and clinical partners as well as ways to test these ideas in environments that inform policy, optimal use cases, and medical education. Forthcoming projects and partnerships will inform our pursuit of human agency in the era of AI and our vision for a future health care workforce. We envision a future health care workforce that will become more viable even as AI becomes more capable.

S. Craig Watkins

Ernest A. Sharpe Centennial Professor,
Moody College of Communication
Executive Director, IC² Institute

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Agency in the Era of AI

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The IC² Institute is a research and innovation hub at The University of Texas at Austin with a rich history of impactful, interdisciplinary research and thought leadership on the drivers of economic development, innovation and shared prosperity.

The Institute is currently dedicated to exploring how humans can thrive alongside artificial intelligence. The rise of AI raises many notable questions, including, what will human experts do in an AI-augmented society and economy? With a strategic focus on human complementary AI in health care, the Institute is studying how humans are adopting AI in ways that enhance decision-making, deepen knowledge, drive clinical innovation, and strengthen patient outcomes.

By combining rigorous, interdisciplinary research with real-world application, the IC² Institute is **exploring a future where human intelligence and expertise remain central in an AI-driven world**.

2024–2025

Year at a Glance

11
faculty research projects funded

18
peer-reviewed publications

27
invited talks and keynotes

88
small businesses trained

15
new strategic partnerships

RESEARCH

THE FUTURE OF PRECISION HEALTHCARE: PERSPECTIVES ON HEALTH AI POLICY

Year of AI   POWERED BY   TEXAS The University of Texas at Austin

High-Impact Research in Health AI

The use of AI in health care is steadily expanding, but with little governance or understanding of the threats and opportunities. IC² continues to engage frontline clinicians and other key stakeholders, illuminating the path for practitioners experimenting with AI and fellow thought leaders wrestling with its ethical, social, economic, and human implications. Through our actionable insights, recommendations, and collaborations, the Institute is helping to chart a responsible future for AI in medicine.

LEARN MORE →

Exploring the Role of Human and Artificial Intelligence in Clinical Practice

As the academic year ended, IC² wrapped up a series of interviews with top doctors working at the forefront of AI. We learned how physicians are incorporating AI into their workflows, how AI is impacting the doctor-patient relationship, and where they draw the line between human and machine capabilities. Our first academic paper is forthcoming, with more deliverables expected in 2026. **Learn more**.

Health AI for Safety-Net Providers: Risks, Barriers, and Opportunities

With funding and collaborative vision from the Episcopal Health Foundation, we created a strategy paper on the use of AI in safety-net health care — drawing upon our in-depth interviews and surveys with over 200 health care providers and stakeholders with experience and expertise in safety-net services, plus an extensive literature review. In August, we had a spirited, strategic conversation about

our findings with the Foundation, and the possibilities of AI's impact on areas such as maternal health, diabetes, and food insecurity. Additional academic papers are forthcoming. **Learn more**.
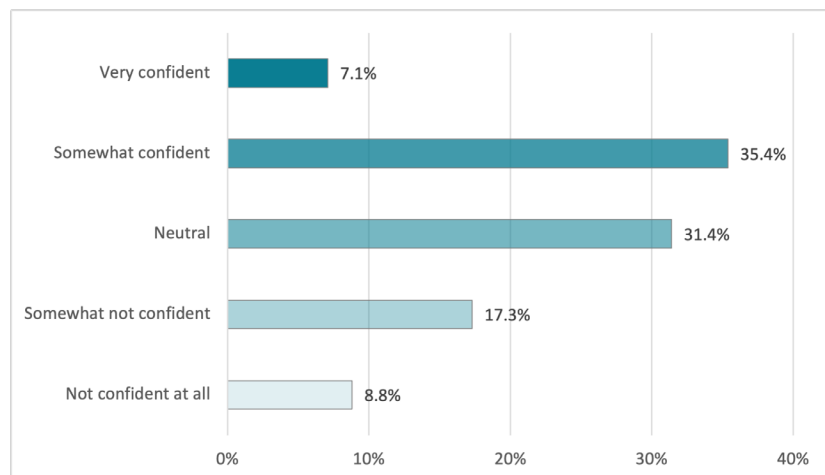
Participant Confidence in Integrating AI Technology into Health Care Workflow

This figure from the report illustrates how confident safety-net health care providers and stakeholders feel about being able to add AI into their workflows, and it suggests a mix of uncertainty in implementing these technologies.

Dell Medical School Partnership Funding

In partnership with Dell Medical School, IC² is sponsoring four interdisciplinary research projects advancing responsible AI in health care. Over the past year, each team examined sources of bias across the AI development cycle and tested mitigation strategies using innovative data and clinical collaborations. Together, these projects provide practical insights and will inform a forthcoming set of best practices. They involve diverse UT departments and affiliated institutions. Summaries of each project and research reflections follow.

- **Intelligent Questionnaire for Seizures**
  Kristina Julich, M.D. • Daniel Freedman, M.D. • Eunsol Choi

- **Ethical AI for Skin Cancer Screening**
  Ruben Rathnasingham • Adewole Adamson, M.D. • DeLawnia Comer-HaGans
  Sharon Ricks • Shiva Jaganathan • John-Paul Clarke • Deepak Chetty

- **Enhancing Pediatric Health for Cardiovascular and Brain Health Outcomes in Multiethnic Pediatric Populations**
  John Michael Virostko, M.D. • Augusto César Ferreira De Moraes

- **De-Biasing Early Colorectal Cancer Polyps Diagnosis Using Generative-AI Data Augmentation and a Complementary Trustworthy Clinician-AI Interactive Framework**
  Farshid Alambeigi • Joga Ivatury, M.D. • Sandeep Chinchali

Intelligent Questionnaire for Seizures

Kristina Julich, M.D.
Daniel Freedman, M.D.
Eunsol Choi

Using machine learning and large language models to build an interactive, intelligent diagnostic tool that can generate individualized questions similar to a specialist interview. The end product will help physicians in low-resource areas diagnose epilepsy more quickly and accurately.

Learn more.

"We diagnose epilepsy based on a description of the seizure event, usually given by the family. The standard epilepsy questionnaire (used in some areas where there are no epilepsy specialists) is really inflexible — unlike clinical experts who adapt questions to what the family is telling us. We think AI can bridge this gap."

- Kristina Julich, M.D.

"Skin cancer AI models have continued to fail in the wild, and this has led to misdiagnosis, delayed diagnosis, 45% longer referral times in underrepresented populations... and along with that, eroded provider and patient trust. How do we tackle that problem?"

- Ruben Rathnasingham

Ethical AI for Skin Cancer Screening

Ruben Rathnasingham
Adewole Adamson, M.D.
DeLawnia Comer-HaGans
Sharon Ricks
Shiva Jaganathan
John-Paul Clarke
Deepak Chetty

Enhancing datasets for AI skin cancer screening tools with new real and synthetic data. Partnering with the FDA, frontline clinicians, and a specially formed community advisory board to create AI model guidance. This initiative will improve skin cancer detection in diverse populations.

Learn more.

"If we're building these AI models, and we know they have bias in them, how can we mitigate those biases and make these predictive models actually work for every child?"

- Jack Virostko

Enhancing Pediatric Health for Cardiovascular and Brain Health Outcomes in Multiethnic Pediatric Populations

John Michael Virostko, M.D.
Augusto César Ferreira De Moraes

Developing comprehensive predictive and machine learning models that integrate clinical, behavioral and environmental factors. Analyzing adolescent brain images and health metrics as a foundation for developing a predictive AI model.

Learn more.

De-Biasing Early Colorectal Cancer Polyps Diagnosis Using Generative-AI Data Augmentation and a Complementary Trustworthy Clinician-AI Interactive Framework

Farshid Alambeigi
Joga Ivatury, M.D.
Sandeep Chinchali

Testing and developing advanced generative AI models, and both visual and tactile methods, for greater accuracy in the detection of colorectal cancer and other colorectal disease.

Learn more.

"The first thing I tell my students is that we don't want to mess with clinicians and their existing surgical workflow — we want to augment what they're doing already. ... We're going to help them to detect better. The whole aim is that clinicians don't miss anything — and don't do extra biopsies. Because if the polyp is fine, if it's not cancer, you don't need to send it for a biopsy. But if we see something suspicious, we can point to that."

- Farshid Alambeigi

Cross-Cutting Research Highlights

Beyond our health and AI efforts, the Institute's wider portfolio continues to inform policy, strengthen communities, and support economic understanding. This section highlights key initiatives from across the Institute, including recent contributions from the Bureau of Business Research.

Leadership Transition at the Bureau of Business Research

Matt Kammer-Kerwick was selected as the director of the Bureau of Business Research (BBR), succeeding Bruce Kellison who retired in January. As BBR enters its next chapter and 99th year, its focus is on untangling and offering key insights into pressing social, environmental, and economic challenges.

Matt joined BBR in 2014 and has led initiatives on a wide range of subjects as a senior research scientist.

"It is my great honor and privilege to serve as director of the BBR. I look forward to continuing to address large, unstructured societal problems toward the goal of broader prosperity for all. I joined this work because I believe in our institutional mission to change the world and our core purpose to transform lives for the benefit of society. It starts here."

– Matt Kammer-Kerwick
Director

"In my time at the Bureau, the most rewarding and useful research projects have centered around what George Kozmetsky called "unstructured problems" facing Texas."

– Bruce Kellison
outgoing Director

Economic Impact of Texas Small Modular Reactor Industry Development, 2024–2053
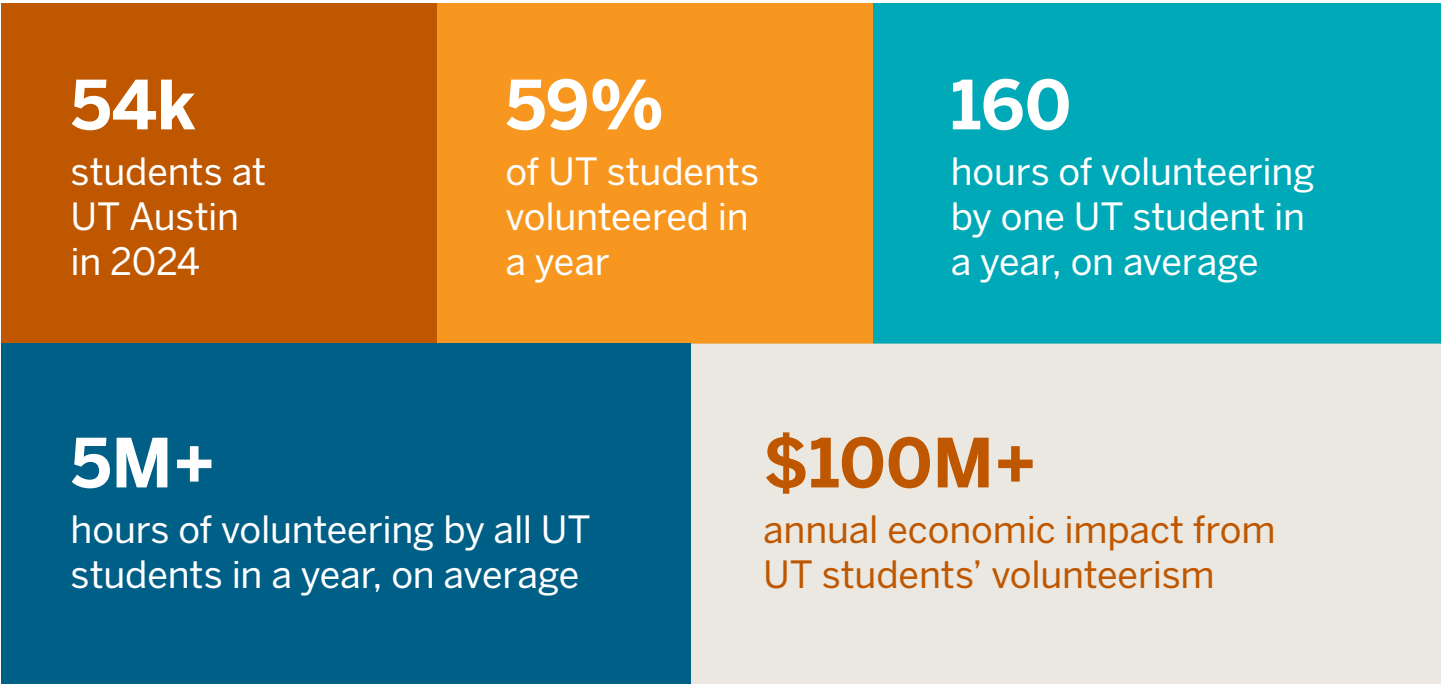
A BBR study for the Public Utility Commission of Texas' **Advanced Nuclear Working Group** estimating the long-term economic impact of developing a Small Modular Reactor (SMR) industry in Texas, including workforce needs, supply chains, incentives, and macroeconomic modeling. The report estimates that, over the next 30 years, the new SMR industry will support an annual average of 148,000 direct and indirect jobs and generate $50.6 billion in new economic output in Texas. **Learn more**.

BUREAU of BUSINESS RESEARCH
The University of Texas at Austin / IC² Institute

OCTOBER 2024

Economic Impacts of Texas Small Modular Reactor Industry Development, 2024–2055

Initial Analysis Report

SUBMITTED TO
PUBLIC UTILITY COMMISSION OF TEXAS
TEXAS ADVANCED NUCLEAR REACTOR WORKING GROUP
COMMISSIONER JIMMY GLOTFELTY

Extent and Impact of UT Austin Student Volunteerism and Participation

This BBR study commissioned by the Office of the Vice President for Student Affairs explores the scale, economic impact, and personal development outcomes of volunteerism among UT students, examining the time they contribute, the skills they gain, and their broader influence on the campus and Austin communities. **Learn more**.

Projected Economic Impact of Volunteerism

54k
students at
UT Austin
in 2024

59%
of UT students
volunteered in
a year

160
hours of volunteering
by one UT student in
a year, on average

5M+
hours of volunteering by all UT
students in a year, on average

$100M+
annual economic impact from
UT students' volunteerism

Waco Smart Corridor Project Partnership

At IC², we know that stakeholders must be a meaningful part of the conversation in the development and deployment of smart technologies and systems. Figuring out ways to design solutions with, rather than, for communities is an essential skill for good work and good outcomes.

The Institute is part of a collaboration for the Waco Smart Corridor Project, involving UT Austin's Center for Transportation Research and the City of Waco, sponsored by the U.S. Department of Transportation's RAISE Program.

We are supporting partner development and contributing to multiple inquiries:

1 Infrastructure assessments, travel behavior analysis, and smart technology evaluations.

2 Community engagement and social impact-focused research, including Quality-of-Life indicators.

3 Corridor typology development and multimodal, transit and freight strategies.

4 Support for scenario testing, feasibility analysis, and final corridor planning.

See our full list of publications. →

STUDENT IMPACT

Investments in Skill Building: Student Research Assistants

Hiring undergraduate, master's, and Ph.D. students reflects the Institute's ongoing commitment to student development by providing practical research and professional experiences.

FOR THE 2024–2025 ACADEMIC YEAR, WE SUPPORTED 18 STUDENT POSITIONS:

3
Graduate Research Assistants

10
Undergraduate Research Assistants

5
additional Graduate Research Assistants hired by Principal Investigators (PIs) funded by the IC² Institute

This year's student researchers reflected the breadth of disciplines engaged in our work. The logos below illustrate our students' schools and colleges.

The University of Texas at Austin
Cockrell School of Engineering

The University of Texas at Austin
School of Information

The University of Texas at Austin
McCombs School of Business

The University of Texas at Austin
Moody College of Communication

The University of Texas at Austin
College of Natural Sciences

The University of Texas at Austin
School of Nursing

Q&A
with Student Researchers

Researching the Researchers: Student Reflections From the Field

Tu-Quyen Dao, a senior biochemistry major, and **Sookja Kang**, a Ph.D. candidate in nursing science, spent the summer interviewing doctors who are at the leading edge of AI in health care. We interviewed them about their experiences and evolving insights about Health AI while collecting and coding this information. Here are a few highlights.

SEE THE FULL STORY ON OUR WEBSITE →

"I was skeptical of using AI in health care. ... But these interviews broadened my understanding of what tools are currently available, and how they could improve human clinicians' efficiency, and possibly make health care more accessible to the broader population."

– Sookja Kang

"The interviews are helping me envision a different type of future. ... With this new prospect of AI, a lot of doctors are excited because they can take on what they signed up for. ... actually helping people rather than focusing on administrative tasks."

– Tu-Quyen Dao

Where Will They Go From Here?

Each year, as our students cycle away from IC^2 and away from UT, we eagerly anticipate hearing where they will dedicate their time and intellect next.
Here are a few early glimpses of their next steps:

Pranavraj Prithviraju

supported small business training at IC^2. After graduating with a double major in business honors and management information systems, he accepted a project manager position at Capital One.

Brooke Butler

also supported small business training at IC^2. After graduating with a marketing degree, she took the role of sales development representative at Oracle.
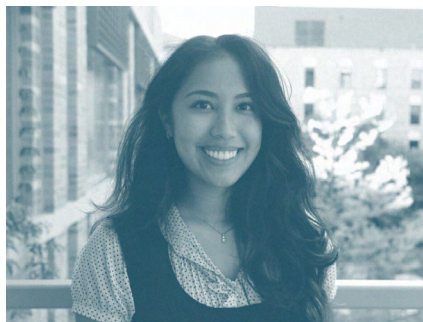
Jackson Edgar

contributed to our student volunteerism study. After graduating with a degree in physics, he is pursuing a Ph.D. in nuclear engineering.

Thanh-Thomas Quach

contributed to multiple IC^2 research projects and graduated in Human Dimensions of Organizations before seeking an HR-related job.

Rayna De Jesus

is now a junior, majoring in computer science. Currently a software engineering intern for Dell Technologies, she contributed to an IC^2 study of health care practitioners' perceptions of AI in delivering care to vulnerable populations.

Yug Dave

worked on an I-Corps data science project and helped analyze the impact of social determinants of health on specific health conditions. After graduating from the School of Information, he is working for the IC^2 Institute as a research associate.

STRATEGIC ENGAGEMENT & PARTNERSHIPS

Local Partnerships Support Small Business Development

July 24, 2025, was a day to celebrate the hard work, persistence, and resourcefulness of small business owners throughout the Austin region. We were honored when Austin Mayor Pro Tem Vanessa Fuentes and the City of Austin issued a proclamation recognizing the Austin Procurement Consortium and our Readiness Training Program for HUBs. The training program offers education, business coaching, and technical assistance tailored to small business owners interested in doing business with public sector entities.

LEARN MORE →
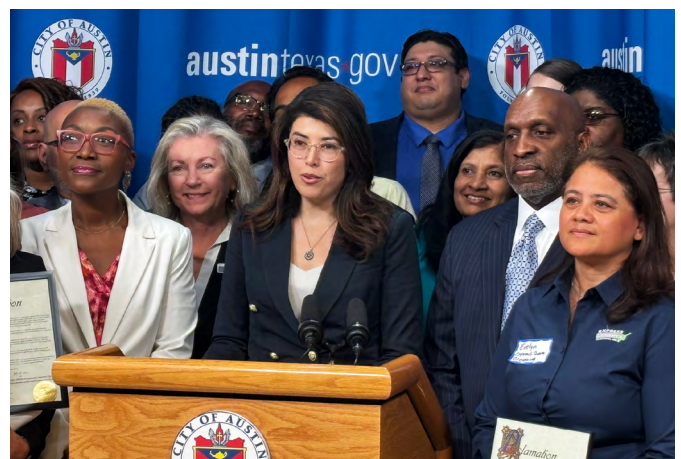
Stakeholder Engagement

In 2024–25, the Institute engaged with stakeholder organizations in various ways — from exploratory conversations and project scoping, to workshops, lab meetings, and continued collaboration with our ongoing partners and advisors.

Lab Meetings

- Austin Technology Incubator
- Cambridge University Medical School
- Chandra Department of Electrical and Computer Engineering, UT Austin
- College of Natural Sciences, UT Austin
- College of Pharmacy, UT Austin
- Dell Medical School, UT Austin
- Department of Civil Engineering, UT Austin
- Department of Diagnostic Medicine, UT Austin
- Department of Internal Medicine, UT Austin
- Department of Neurology, UT Austin
- Moody College of Communication, UT Austin
- UT Health Houston School of Public Health in Austin
- Via Hope
- Walker Department of Mechanical Engineering, UT Austin

IC² Institute Advisory Board

- Chiquita A. Collins, UT Health San Antonio
- Chris Jarvis, The Canfield Training Group
- Chris May, Deloitte
- Jo Carcedo, retired philanthropy executive
- Jordan Scott, Reissa Foundation
- Sarah Riggs Amico, Jack Cooper

Research Participants

- Lone Star Circle of Care
- Mathematica
- Memorial Hermann
- Mosaic Counseling Center
- Samaritan Counseling Center of Southeast Texas
- Social Work Fellows Program, Steve Hicks School of Social Work
- SpindleTop Center
- Texas A&M Digital Health
- Texas A&M School of Law
- Texas A&M Telehealth Institute
- The Joint Commission
- TORCH
- University of Colorado
- UT Counseling and Mental Health Center
- UT Southwestern
- UT Austin University Health Services and Counseling and Mental Health Center

Convenings and Collaborations

- City of Austin Office of Innovation
- Deloitte
- Health AI Platform for Decision Support toward Equitable Delivery of Healthcare to Multi-Factor Isolated Communities (HEADS UP)
- Human-Centered AI, Bournemouth University
- School of Computer Science, University of Nottingham
- School of Law, University of Nottingham
- School of Science, Technology and Health, York St John University
- Texas Health and Human Services, Rural Mental Health University Advisory Group

ACKNOWLEDGEMENTS
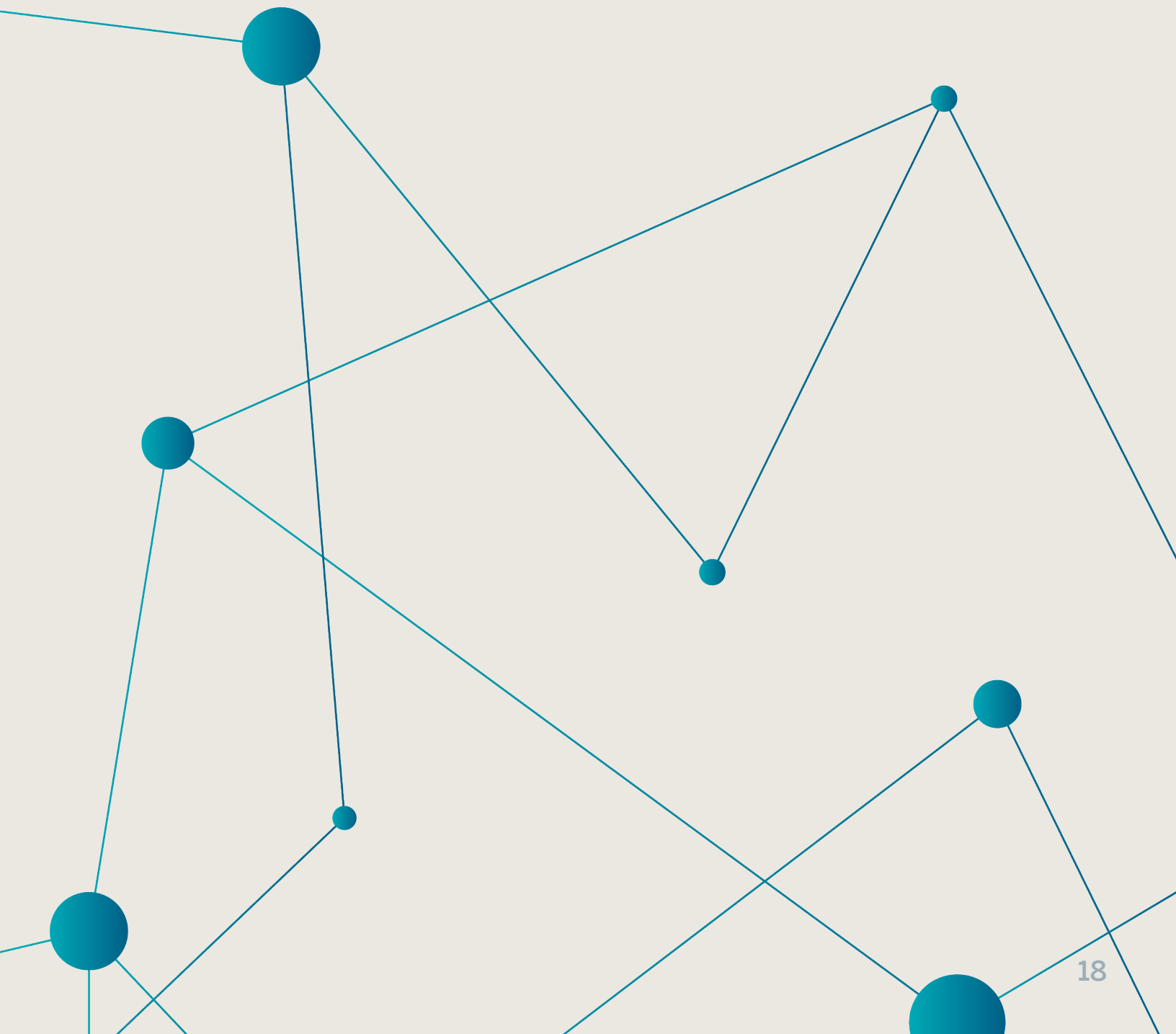
GREG POGUE, *IN MEMORIAM*
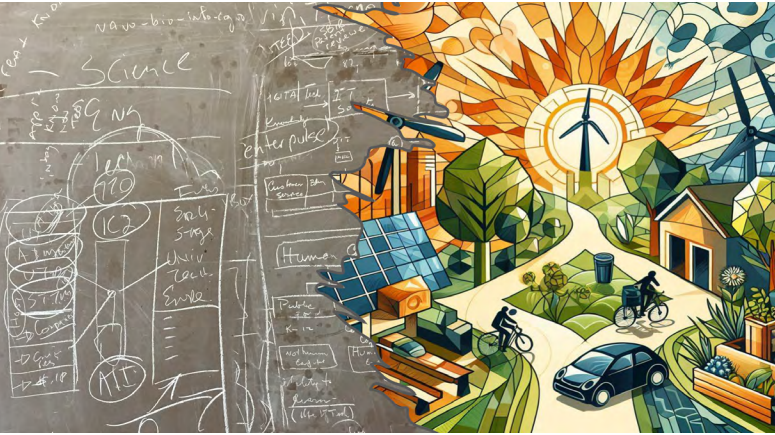
In August 2025, we lost our dear friend and brilliant colleague **Greg Pogue**.

Greg Pogue was a prolific thinker and a scientist at heart. He wanted to, and did, impact IC² and the larger world in significant ways — thousands of lives touched; hundreds of business, policy, and community-driven successes; and nearly a billion dollars into economies in Texas and across the globe.

We will miss Greg's generous spirit and his insatiable appetite for knowledge, his genuine fellowship and enthusiasm for life, and his rare ability to turn complex challenges into shared opportunities to find a smart path forward.

We are grateful for the many paths and ideas Greg inspired.

Here is a paraphrase of the reflections Greg shared on his career achievements as his professional life began to wind down due to the limitations of ALS.

Together, we... taught, trained, built, guided, and strengthened.

We invented, innovated, designed, and launched.

We investigated, unpacked, and observed.

We refined and reenvisioned.

We accelerated, we rebalanced — and we sparked new growth.

We led and followed.

Always, we collaborated.

As many of the individuals and groups named throughout this report are external or time-limited contributors, we conclude with an acknowledgement of the **Institute's staff** — whose leadership and day-to-day work enabled the initiatives, partnerships, and programs highlighted in 2024–25.

PICTURED FROM LEFT TO RIGHT:

Greg Pogue
Matt Kammer-Kerwick
James Jarrett
Kelley Shrock
S. Craig Watkins
Mary Rodriguez
Bruce Kellison
Cara Lowrimore
Emily Spandikow
Yug Dave *(not pictured)*

IC² Institute

Vice President for Research, Scholarship and Creative Endeavors

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and further information:

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