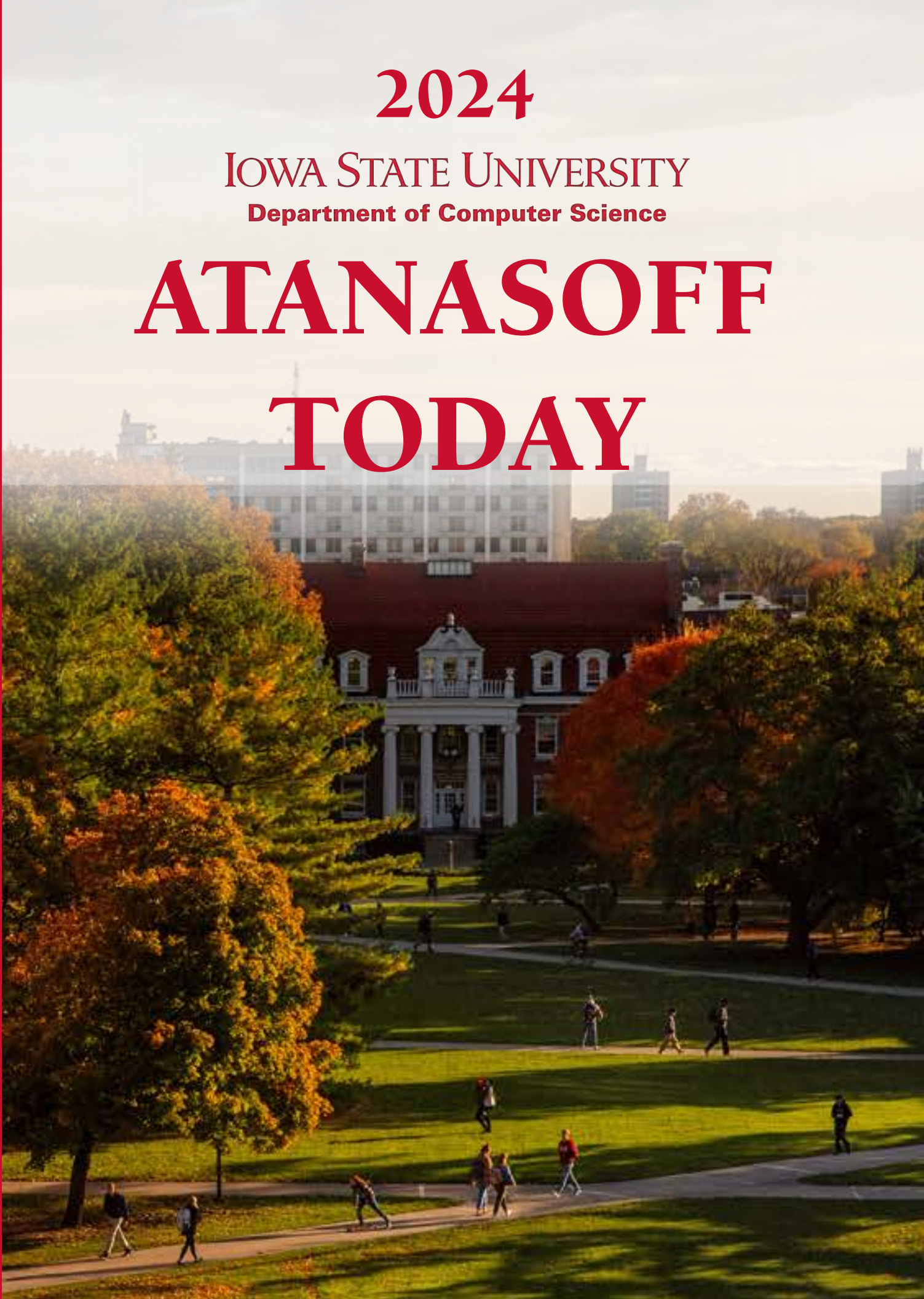


2024

IOWA STATE UNIVERSITY  
Department of Computer Science

**ATANASOFF  
TODAY**





Founded in 1969, we are the **#1** **computer science program in Iowa**. We lead the way in creating, sharing, and applying computing knowledge to continue to grow our legacy of excellence.

**1,517**  
undergraduate students

\*640 Software Engineering Students

**261**  
graduate students

\*62 M.S. in CS  
34 M.S. in AI  
165 Ph.D.

**308**  
female students

\*61 M.S. & Ph.D.  
147 Undergraduates  
100 Software Engineering

### OUR DEGREE PROGRAMS

#### UNDERGRAD

- BS in Computer Science
- BA in Computer Science
- BS in Software Engineering
- BS in Data Science
- Minor in AI

#### GRADUATE

- Minor in AI
- MS in Computer Science
- MS in AI
- BS in Computer Science and MS in Computer Science
- BS in Computer Science and MS in AI
- Ph.D. in Computer Science

### 2022-2032 STRATEGIC PLAN

We are thrilled to share with you the strategic plan until 2032, which acts as a compass for our department; guiding us into the next decade toward a brighter future. The Strategic Plan was the culmination of planning and development accomplished by the Strategic Plan Committee.



FULL STRATEGIC PLAN

### MULTIPLE NEW DEGREE PROGRAMS



*B.A. in Computer Science*



*B.S. in Data Science*



*M.S. in AI*

### FACULTY OVERVIEW

**44**  
faculty members

**33**  
tenure-track faculty

**27%**  
female tenure-track faculty

**\$11M+**  
in external grant funding

### NSF CAREER AND PYI AWARD WINNERS



MYRA COHEN



YAN-BIN JIA



WEI LE



QI LI



JACK LUTZ



ANDREW MINER



WALLAPAK TAVANAPONG



NOK WONGPIROMSARN

### NEW FACULTY



**ASHWIN KALLINGAL JOSHY**  
Lecturer



**REGIS KOPPER**  
Assistant Professor



**AMBROSE KOFI LAING**  
Associate Teaching Professor



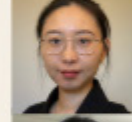
**TRENT MUHR**  
Lecturer



**AMIT KUMAR SIKDER**  
Assistant Professor



**BOWEN WENG**  
Assistant Professor



**WENTING XU**  
Assistant Teaching Professor



**LIN YAN**  
Assistant Professor

### RESEARCH CLUSTERS

AI, machine learning, and data science

Bioinformatics and computational biology

Human computer interaction

Software engineering and programming languages

Robotics and autonomous systems

Systems and networking

Theoretical foundations



# LETTER FROM THE CHAIR

## Dear Friends and Alumni of the Department,

As Interim Chair of the department, I am pleased to share with you the 2024 edition of Atanasoff Today. This past year has brought leadership changes at multiple levels, including the Department Chair, the LAS Dean, and the Provost. I began my role as Interim Department Chair on July 1, and these past months have been a humbling experience. I have had the opportunity to witness firsthand the incredible dedication, achievements, and success stories within our department. I am eager to see the continued remarkable contributions from our students, faculty, and staff in the upcoming year and am honored to lead the department into another productive year.

### An Update on the Student Body and Our Programs

The department continues to serve a large body of students, and we remain committed to fostering their growth and development. The current student body includes 877 Undergrad students and 254 Graduate students in CS, in addition to 645 undergraduate students in Software Engineering Students and 94 Data Science students. Our BA program started last year has 25 students. In addition, we launched AI minors at undergraduate and graduate levels. We look forward to collaborating with various departments across the campus in creating new computing-oriented opportunities for the students. Recently, we relocated our Undergraduate Advising team and the Computer Science Help Room to a new, more central location in the Durham Computing Center, enhancing our capacity to support the students. Soon our students will have access to facilities in the robotics teaching lab.

### Faculty Achievements

Our faculty's achievements over the past year have been remarkable. Robyn Lutz became the first Distinguished Professor from our department—the highest academic honor that ISU bestows. This award is testament to Robyn's extraordinary research and exemplary service. Wallapak (Pak) Tavanapong received the Lange Faculty Excellence Award in recognition of her leadership in the National Research Traineeship program and her impactful work on broadening participation in computer science. Congratulations to Robyn and Pak on these outstanding honors!

We also celebrate the promotions of Jim Lathrop and Ali Jannesari, who have been promoted to Associate Professors. This fall, we welcomed two new tenure-track faculty members, Regis Kopper and Amit Kumar Sikder. Regis brings expertise in extended reality user experiences, virtual reality simulations, and applied research in extended reality. Amit's research focuses on system security, artificial intelligence, machine learning, and the Internet of Things. Additionally, we welcomed two new lecturers, Trent Muhr and Ashwin Joshy, both proud graduates of our department. Last spring, we celebrated the impactful career of Steve Kautz upon his retirement. We also bid farewell to our former Chair, Hridesh Rajan, who has taken on a new role as Dean at Tulane University, and to Jin Tian and Forrest Bao as they embark on the next stages of their careers. Good luck to Hridesh, Jin and Forrest!

### Research and Funding

On the research front, our faculty and students continue to be at the forefront of the latest developments across various subfields of computer science, leading a top-50 standing in areas such as Artificial Intelligence, Software Engineering, Mobile Computing, and Robotics (according to the 5-year CSrankings). Over the past year, our faculty has secured over \$2 million in research funding from agencies like NSF and DoE, as well as from industry partners.

### Donor Support

Thanks to your generous support, we awarded over \$50,000 in scholarships last year to recognize and support our students. We are immensely grateful for this generosity and look forward to continuing to support our students. Your contributions are strategically invested to provide students with high-impact learning experiences that go beyond the classroom and to provide the resources they need to excel.

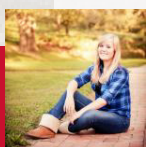
As we look forward to the year ahead, we anticipate even more notable accomplishments from our students, faculty, and staff. We anticipate many more remarkable achievements in the coming year. Your continued support is greatly appreciated.



**Pavan Aduri**  
Professor and Interim Chair

# TABLE OF CONTENTS

DEPARTMENT OVERVIEW	4
DEPARTMENT UPDATES	6
NEW FACULTY	7
FACULTY GRANTS	8
FACULTY AND STAFF AWARDS	9
ONE OF A KIND STUDENT EXPERIENCES	10
UNDERGRADUATE STUDENT SPOTLIGHT	12
GRADUATE STUDENT SPOTLIGHT	16
GRADUATE AWARDS & PUBLICATIONS	18
SCHOLARSHIP IMPACT	20
STUDENT Q&A: SUMMER INTERNSHIPS	26
AWARD WINNING FACULTY	30
FACULTY SPOTLIGHTS	32
DEPARTMENT OUTREACH SPOTLIGHT	39
OUTSTANDING ALUMNI	40
ALUMNI SPOTLIGHTS	42
ALUMNI AWARDS AND NEWS	46



12

Read about Elizabeth's journey on returning to finish her degree in Computer Science, and her experience as a returning student.



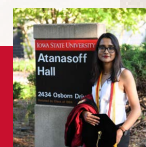
30

Discover Dr. Huai's work on ensuring user privacy and Dr. Weng's work on robot safety testing.



39

Learn about our high school programming competition and AI Jumpstart.



45

"Iowa State truly became my home away from home." Read our alumni spotlight to see the impact Iowa State had on Eshita Zaman's career.

# INVEST IN INNOVATION



Scan here  
to make a  
gift.

## Join us in growing our community of leaders and innovators.

Here at Iowa State University, we are proud to uphold our rich legacy of leadership in computing. For over 50 years, our department has been dedicated to cultivating a culture of innovation and excellence.

## Help support our community.

Through your support, you can help us create transformative opportunities for our students. Your contributions are vital to our success. They fund impactful activities seen throughout this publication, such as undergraduate research experiences, our Computer Science Help Room, Peer Mentoring, our programming contests, our Publication Awards that recognize graduate research published at top-tier international conferences, seed funding for summer projects, and need- and merit-based scholarships. Your support also enhances K-12 outreach initiatives and other resources.

## Every gift counts.

Whether it's \$50, \$500, or \$5,000, each donation makes a meaningful impact on our community and helps shape the future of technology.

## Get involved.

Be part of this exciting journey! Scan the QR code, visit our new website and click "Give," or email us at [csdept@iastate.edu](mailto:csdept@iastate.edu).

Together, we can ensure that Iowa State University continues to lead in computing excellence.

**“Receiving the departmental Publication Award was a significant milestone that validated the effort and dedication I put into my research. It not only reinforced my confidence in pursuing innovative ideas but also motivated me to aim for higher standards and more challenging topics.”**

Yanhui Zhu  
2024 Computer Science Publication Award recipient

**“Hearing students share their successes and knowing that my guidance contributed to their achievements is incredibly rewarding. I truly love being part of the Help Room tutor team.”**

Rahul Sudev  
Undergraduate Help Room Tutor

**"Continued support for scholarships is crucial for empowering students like myself to achieve their goals and make lasting contributions."**

Maya France  
2024 Computer Science Scholarship recipient

## NEW SPACE

Over the summer, our Undergraduate Advising Office and our Computer Science Help Room, along with some of our faculty, moved to the Durham Center For Computation & Com. They are now located in the west wing of the first floor of Durham - which is next door to Atanasoff Hall.

## NEW MS CAPSTONE

In Spring 2024, we began our new capstone course for MS students. In the course, students obtain real world experience working on projects in small teams. The projects students work on are submitted from Iowa State University faculty, organizations, and corporations throughout the state of Iowa. In its first year, we had 20 students participate in the program.



## NEW CHAIR

Iowa State University's College of Liberal Arts and Sciences announced the appointment of Pavan Aduri, Professor of Computer Science, as interim chair of the Department of Computer Science. He joined Iowa State University in 2001 and served as the department's Director of Graduate Education before his chair appointment.

Dr. Aduri's research interests are in computational complexity theory and algorithms. His work seeks to understand computational resources, such as time, memory and randomness, to solve computational problems. He made notable contributions to complexity theory, data stream algorithms, and replicable computations.

Aduri obtained his Ph.D. from the University of Buffalo. His interim role began on July 1, 2024 and will continue through June 30, 2025.

## NEW AI MINORS

In fall, the department launched two new AI minors, one for undergraduate students and one for graduate students. Both of the minors allow students to learn basic AI and machine learning techniques, and apply AI methods to solve problems. Through the minors, students will learn the knowledge and fundamental skills needed to apply AI and machine learning techniques in the workforce - which will help them better compete for positions with significant AI elements. Both these minors and the MS degree in AI that we established two years ago serve as another way we continue to lead the way in artificial intelligence in the state of Iowa.



**(above) The students in the first MS Capstone course, Spring 2024, with Dr. Simanta Mitra (far left) and Dr. Pavan Aduri (far right).**

# 2024 NEW FACULTY



**Ashwin Kallingal Joshy** is a Lecturer of Computer Science at Iowa State University. He received his Bachelors degree in Electronics and Communication Engineering from Amity School of Engineering & Technology in 2013. He received his Masters and PhD degrees in Computer Science from Iowa State University in 2017 and 2023, respectively, under the supervision of Dr. Wei Le.



**Regis Kopper** is an Assistant Professor of Computer Science at Iowa State University. He researches extended reality (XR) interfaces and user experience (UX) for immersive interactive systems. His research involves interaction design, simulation, and training, focusing on the design and evaluation of highly effective 3D user interfaces and their application in critical areas such as public safety and health care. More recently, Dr. Kopper has expanded his research to investigate the potential of immersive technology for delivering equitable, sustainable, and accessible healthcare. Dr. Kopper's research has been funded by prestigious organizations such as the DoD, NSF, NIH, and NIST. He holds a B.A. and M.S. in Computer Science from the PUCRS, Brazil, and a Ph.D. in Computer Science from Virginia Tech.



**Ambrose Kofi Laing** is an Associate Teaching Professor at the Department of Computer Science at Iowa State University. He earned his Ph.D. in Computer Science from The Johns Hopkins University in 1999. His research expertise is in Parallel and Distributed Computing. His career includes prior experience in research and teaching at Tufts University, and Industry positions at JP Morgan Chase, Nuance Communications and Google.



**Trent Muhr** received his MS in Computer Science from Iowa State University in 2024. He joined the Department of Computer Science at Iowa State University in the Fall of 2024 as a Lecturer. His research interests are in applied cryptography and cloud computing.



**Amit Kumar Sikder** is an Assistant Professor in the Department of Computer Science at Iowa State University. He completed his Ph.D. in Electrical and Computer Engineering from Florida International University (FIU) in 2020. Before joining Iowa State University, he worked as a research scientist in the School of Cybersecurity and Privacy at the Georgia Institute of Technology. His research interests lie in the intersection of computer system forensics, artificial intelligence, and program analysis. His research has developed novel techniques to model smart device, system, and app behaviors during task execution (AI-assisted, user-initiated, and dynamic tasks) by correlating intra and inter-device data-sharing patterns, program analysis, and system forensics. He has published over 20 papers in top-tier security conferences including USENIX Security, ACM CCS, NDSS, and ACSAC. His research has received several awards including UGS Provost Award for Outstanding Creative Project and Dissertation Year Fellowship at FIU. His research has been featured in several national and international media outlets including ACM Tech News, The Register, PBS News, NBC News, and Science News.



**Wenting Xu** is an Assistant Teaching Professor for the Department of Computer Science and the Department of Statistics and Iowa State University. She received her PhD in Materials Science and Engineering from the University of Cincinnati, and has an MS in Computer Science from Clemson University.

# 2024 FACULTY GRANTS AWARDED

## **New Directions in Algorithmic Replicability**

funded by the National Science Foundation

**Pavan Aduri**

## **New Directions in Data Streaming: Models and Algorithms**

funded by the National Science Foundation

**Pavan Aduri**

## **Authentication Data Structures for Rank-aware Queries**

funded by the Air Force Research Laboratory

**Ying Cai**

## **A System Perspective of Blockchain Fault Tolerance: Foundations, Modeling, and Measurement**

funded by the National Science Foundation

**Myra Cohen**

## **Security and Privacy in Machine Unlearning**

funded by the National Science Foundation

**Mengdi Huai**

## **Development of Domain-Specific LLM for Data Strategy in Energy Sector**

funded by the National Science Foundation and Oak Ridge National Laboratory

**Ali Jannesari**

## **Integrating Formal Methods into the Foundational Undergraduate Curriculum**

funded by the National Science Foundation

**Jim Lathrop, Samik Basu, and Andy Miner**

## **Just in Time Verification for High Performance Compilers**

funded by the National Science Foundation

**Liyi Li, Ali Jannesari, and Myra Cohen**





# FACULTY AND STAFF AWARDS

**Pavan Aduri** was selected to Future CRA Leaders Program.

**Shu-Hui (Susan) Chang** earned QM and CELT High Quality Certifications for her work on COM S 1060. She also received the Departmental Excellence in Teaching Award.

**Gianfranco Ciardo** became Life Senior IEEE member. He was also awarded the Departmental Excellence in Teaching Award.

**Myra Cohen** gave the keynote address at the ACM International Conference on the Foundations of Software Engineering. She was also elevated to IEEE Senior member. Her paper also received honorable mention at the Conference on Human Factors in Computing Systems.

**Snow Grey** gave a presentation at the IowaAAN conference.

**Mengdi Huai** received the 2024 AAAI New Faculty Highlight Award. She was also awarded the Departmental Excellence in Teaching Award.



**Ali Jannesari** received the Dean's Emerging Faculty Leaders Award from Dean Schmittmann in Spring 2024.



**Kristine Loes** received the LAS Institutional Service Award from Dean Withers in Fall 2024.



**Robyn Lutz** was named the Department's first Distinguished Professor. She is pictured receiving the award from Iowa State University President Wendy Wintersteen and Jason Keith, Provost of Academic Affairs.

**Chenglin Miao** receiving Distinguished Paper Award at 2023 Annual Computer Security Applications Conference.

**Wallapak Tavanapong** was awarded the Lange Faculty Excellence Award.

**Kate Sharma** was awarded the Departmental Excellence in Support Award.

**Adisak Sukul** was named a Google Cloud Champions Innovator. He was awarded the Departmental Excellence in Teaching Award.

**Tichakorn (Nok) Wongpiomsarn** gave an invited talk at Midwest Robotics Workshop, and was the keynote speaker at the 2024 IFAC Conference on Analysis and Design of Hybrid Systems.

**Lin Yan** received the 2024 IEEE TVCG Visualization Dissertation Award.

**Wensheng Zhang** received Best Paper Award at 2023 IEEE International Conference of Software Services Engineering.







# ONE OF A KIND

## STUDENT EXPERIENCES

HEAR FROM OUR STUDENTS AS THEY  
SHARE THEIR EXPERIENCES AT IOWA  
STATE UNIVERSITY.



# UNDERGRADUATE STUDENT SPOTLIGHT

## Meet Elizabeth Nible.

In the Fall of 2016, Elizabeth arrived on campus at Iowa State University as a double major in Computer Science and Communication Studies. However, the challenges of navigating a new field and personal setbacks led her to reconsider her journey. Following a break from her studies in Computer Science, she made the decision to return to campus to complete her Computer Science degree.

“Elizabeth is an outstanding student and person,” said her advisor, Deb Holmes. “As an advisor, I am impressed with her persistence and ability to connect with her professors and peers. She is a great example and leader to our new students through her role as a peer mentor. We are excited to see what the future holds for Elizabeth!”

We sat down with Elizabeth to hear about her journey as she prepared to graduate with her Computer Science degree in May 2024.

I started at Iowa State in the Fall of 2016 as a double major in computer science and communication studies. I originally was only focused on computer science and thought I would end up eventually dropping communication studies, but after taking COMST 1010, I realized how interesting communication theory was to me and how the degree would help me no matter what career path I took in life, so I decided to stick with it.

My first semester was a great experience, but I struggled with my classes. My high school didn't offer any coding classes, so my first exposure to programming was COM S 227. As someone who had built my identity around being the "smart kid" in high school, I struggled greatly with my class performance. This started some of my feelings of imposter syndrome, but the amount that I struggled with coding compared to my peers exacerbated it. I felt silly asking my peers and the professor basic programming questions, and I was afraid to use any online or outside resources because I didn't want to be accused of cheating. I isolated myself a lot during this period and didn't build a good support system for myself because I felt like I would drag people down with my struggle to understand.

After my first semester during winter break, my dad unfortunately had some significant health problems that drastically changed my home life. I tried to find a balance between school and home life in my second semester, but I was struggling significantly, and my imposter syndrome was getting increasingly worse. When I returned to school for the fall semester of my sophomore year, I realized that I needed to change something, or my school performance and personal well-being would suffer. Because computer science was a significantly more time-consuming degree and was causing me a lot of stress, I decided to focus on my communications degree instead. Because both degrees are in the College of Liberal Arts and Sciences, this allowed me to still make some passive progress on my computer science degree regarding humanities and diversity credits.

I remember the huge relief I felt when I made that decision, and I didn't feel like I had this constant weight looming over me. My dad's health continued to decline during this time, so my focus pivoted to finishing my degree as quickly as possible so that he would be able to see me graduate, which was a big deal for me as a first-generation college student. I could finish the degree in three years instead of 4, taking summer classes while working full-time to help reach my goal.

Unfortunately, my dad passed away a month and a half before graduation, and it felt like I faceplanted right before the finish line. I debated if I should crawl my way to the end or give up. Ultimately, I decided I had come too far and worked too hard to give up now.

After I graduated, I began working at a law firm in Des Moines. I worked with some amazing mentors and team members but realized I was not on the right path. After a gap year turned into a gap year plus COVID, I finally decided that the best way for me to expand my career opportunities and get a job that met all of the important qualities I was looking for was to go back to ISU in the fall of 2022 and finish my computer science degree.

**"To feel important to someone from a time when I felt isolated and like no one cared was so refreshing and probably one of the main reasons I decided to stick with my decision to return."**

This idea absolutely terrified me. I remember emailing my advisor, Deb Holmes, explaining that I was considering returning to finish my degree. She immediately remembered me, and I remember how warm and welcoming her email back to me felt. To feel important to someone from a time when I felt isolated and like no one cared was so refreshing and probably one of the main reasons I decided to stick with my decision to return.

After getting as much practice as possible while juggling working full time, moving to Ames from Des Moines, and taking classes at DMACC, I finally came to my first day at Iowa State. I've always loved this campus, so it felt great to be back. What surprised me the most was the increase in diversity in the computer science major. I was overjoyed to see an increase in women like me who are passionate about STEM.

The professor that stood out to me the most was Dr. Samik Basu. I had heard horror stories about how difficult COM S 3110 can be. Taking the class 6 years after I had taken the prerequisites didn't help my nerves. However, Dr. Basu was one of the kindest professors I could have asked for during this transition period. He always did a great job answering me, explaining when I did something wrong, and taking pity when my first coding project in Java didn't go as planned. His kindness and support went a long way in bringing back my confidence.

Imposter syndrome is a tricky thing, and sometimes, even though you know logically that everything is okay, it can be hard to progress when emotionally you are feeling significant stress. Every time I got on LeetCode to refresh my coding skills before returning to

school, I would immediately feel dread and panic in the pit of my stomach if something didn't immediately compile. I could feel my heart start racing, and my head would be spinning. If I couldn't complete an easy LeetCode problem now, six years later, how would I return to a degree I was halfway through?

The main things that have helped my imposter syndrome are:

- Breaking up code/problems into small tasks that I know I can get working/answering and slowly building off that.
- Starting assignments early.
- Learning how to feel comfortable asking for help.
- Telling myself "I will work through this problem until I am to the point of making no real progress, and then I will go and get help from people who want to see me succeed, and together we will be able to reach that goal, and everything will work out" to reassure myself.
- Talking through my code to my dog or writing it out on a whiteboard to see where I am getting stuck.
- Taking a deep breath, recognizing that I am feeling imposter syndrome and that it is normal and something a lot of people face.

I have also found that being more open with my friends and peers about my struggle with imposter syndrome has also helped me overcome a lot of those feelings and has helped me feel not so alone, realizing how many others have the same thoughts about themselves.

I am a big believer in the phrase, "If you're the smartest person in the room, then you are in the wrong room," so reframing my thinking from feeling like an imposter to realizing I have an opportunity to learn and grow from those around me also helps.

**“As I get towards the finish line of my degree, I know it was completely worth it... I realize how much I have grown in all aspects of my life in the last year and that I have overcome a major hurdle and turned it into an extremely positive experience.”**

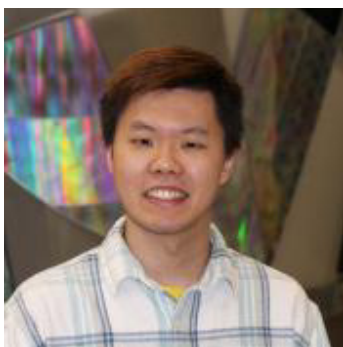
I didn't build a strong social circle my first time at college, and having one now, I realize how important friends are and how they can contribute to your success. I attribute a lot of my success to them. It's great to have a good support system of friends to build you up and remind you of your accomplishments when the doubt starts to creep in.

I worried a lot about making friends as an older student, but I've been incredibly lucky to have met some really amazing students I call friends. I've gotten good at making small talk with people when I join a new class or getting introduced to someone new by someone I am already friends with and every time, it's helped me meet some cool people. It's one of the main reasons I am glad I came back; otherwise, I would have missed the opportunity to meet so many wonderful people I plan to keep in touch with after graduation.

Having already completed a prior bachelor's degree from ISU, I didn't qualify for most scholarships, so I have been working multiple part-time jobs to help pay for my schooling. It was a big adjustment going from a regular stable income to not being able to work as many hours as I wanted and also having to

fund my tuition myself, and it was a decision I was worried I would regret going back to school. As I get towards the finish line of my degree, I know it was completely worth it, but I empathize with anyone who has decided not to complete a degree. Knowing how much of an impact coming back to school has made on my life socially, emotionally, financially, etc., also helped me stick with it when I was struggling because I knew I had invested myself in this decision and it wouldn't be fair to myself to give up now.

Overall, it feels surreal to be graduating. A few years ago, I thought that finishing my degree would be one of those things that got away from me, and I was never able to complete it. Last year, I thought I was making a big, expensive mistake and would be a walking example of “you can't teach an old dog new tricks.” This year, I realize how much I have grown in all aspects of my life in the last year and that I have overcome a major hurdle and turned it into an extremely positive experience. I will miss being a student at Iowa State, but I am excited to see what my second chance at a new chapter of my life brings me!



# GRADUATE STUDENT SPOTLIGHT

## Meet Zili Wang.

Zili Wang, a Computer Science Ph.D. student, has been awarded the prestigious NSF Graduate Research Fellowship award. He is currently working with Professor Kristin Yvonne Rozier at the Laboratory for Temporal Logic. His research is at the intersection of machine learning and formal methods. He is interested in leveraging techniques in formal methods and machine learning to solve problems such as the detection of forced labor in supply chain management. He is also interested in making formal methods more widely accessible to system designers and studying the learnability of temporal logic from data.

The National Science Foundation Graduate Research Fellowship Program (NSF GRFP) is a prestigious fellowship program in the United States that provides financial support to graduate students pursuing research-based master's and doctoral degrees in STEM (Science, Technology, Engineering, and Mathematics) fields or in STEM education. Applicants are evaluated based on their intellectual merit and the broader impacts of their proposed research, as well as their potential to contribute to a diverse and inclusive scientific workforce. The fellowship is for three years, with financial support provided in terms of an annual stipend and allowances for tuition and fees. The fellowship also provides professional development and networking opportunities.

To gain insight into the application process, we spoke with Zili Wang. We discussed his background, his journey with the NSF GRFP, his goals, and any advice he could offer students who are interested in pursuing a similar path.



## Can you start by telling us a bit about yourself and your background?

I grew up in the Bay Area, in California, and I studied mathematics and computer science at UC Berkeley. I first came to Iowa State University in summer 2022 to participate in the very awesome ISU Math REU (Research Experience for Undergraduates) organized by Steve Butler and Bernard Lidicky. Professor Rozier mentored my team, and I learned about the field of formal methods. I also had one of the best summers of my life here in Ames, which is why I ultimately chose to come back for the PhD.

Mathematics has always been my passion, but I was inspired to study computer science by the groundbreaking success of AlphaGo in playing the game of Go. My current research in formal methods is, for me, a perfect combination of theory and practice that allows me to continue learning about both mathematics and computer science.

Throughout my graduate studies, I hope to make contributions that are both theoretically interesting and practically useful in tackling real problems.

I want to solve difficult problems, ideally for a living. I haven't yet decided if I want a job in academia or industry in the future, but I do know that I want to do research that is both interesting to me and useful to the world.

## Congratulations on receiving the NSF GRFP. That's a fantastic accomplishment. How did you hear about the award?

I first learned about the NSF GRFP while participating in the 2021 Texas State Math REU (Research Experience for Undergraduates).

My major professor, Kristin Yvonne Rozier, was by far the most helpful in providing me with invaluable feedback and helping me polish my application materials. I could not have done it without her! Additionally, I found the one-on-one writing consultations with the ISU writing center to be immensely helpful for additional peer review.

## What is the application process like?

Three letters of recommendation, a three-page personal statement, and a two-page research proposal. The boring (but important) logistics can be found at <https://www.nsfgrfp.org>. It's a relatively involved application, so try to start as early as possible!

## What advice would you give to future applicants?

Look at previous successful GRFP applications! Read through at least several applications in your field to get a sense of what a strong application looks like. Start as early as possible (August is a good time, it's due in October), and get as much feedback from as many people as you can.

## What advice do you have for aspiring researchers who are considering pursuing graduate studies in STEM fields?

I will relay a great piece of advice I received: graduate school is HARD and comes at a steep opportunity cost (especially in computer science). Think hard about your reasons for pursuing graduate studies and make sure that it will advance your career!

# GRADUATE STUDENT AWARDS

## Robert Stewart Early Research Recognition Award

Yiddiya Nadew

Salil Purandare

## Teaching Excellence Award Recipients

Sadiya Ahmad

Arijit Bhattacharjee

Hongyi Bian

Joshua Ellis

Haniyeh Fekrmandi

Jahid Hasan

Seok Song

## Research Excellence Award Recipients

Shibbir Ahmed

Tianxiang Gao

Michael Gerten



Zihao Liu received the Distinguished Paper Award at the 2023 Annual Computer Security Applications Conference for his first-author paper "Protecting Your Voice from Speech Synthesis Attacks."





(above) Some of the students at the Department Award's Banquet.

## RESEARCH EXCELLENCE

**18** papers accepted to **13** top-tier conferences

**1** paper accepted to **ACM Conference on Embedded Networked Sensor Systems (SenSys 2024)**

**1** paper accepted to **ACM Conference on Empirical Methods in Natural Language Processing (EMNLP 2024)**

**1** paper accepted to **ACM Conference on Human Factors in Computing Systems (CHI 2024)**

**1** paper accepted to **Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2024)**

**2** papers accepted to **AAAI Annual Conference on Artificial Intelligence (AAAI 2024)**

**2** papers accepted to **Annual Conference on Neural Information Processing Systems (NeurIPS 2024)**

**1** paper accepted to **IEEE International Conference on Robotics and Automation (ICRA 2024)**

**1** paper accepted to **IEEE/ACM International Conference on Software Engineering (ICSE 2025)**

**1** paper accepted to **International Conference for Design Automation (DAC 2024)**

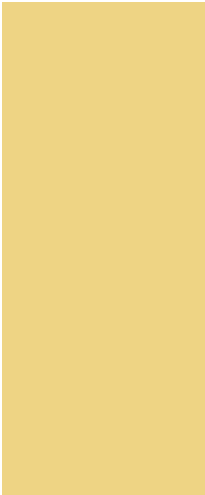
**2** papers accepted to **International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2024)**

**1** paper accepted to **International Conference on Computer Aid Verification (CAV 2024)**

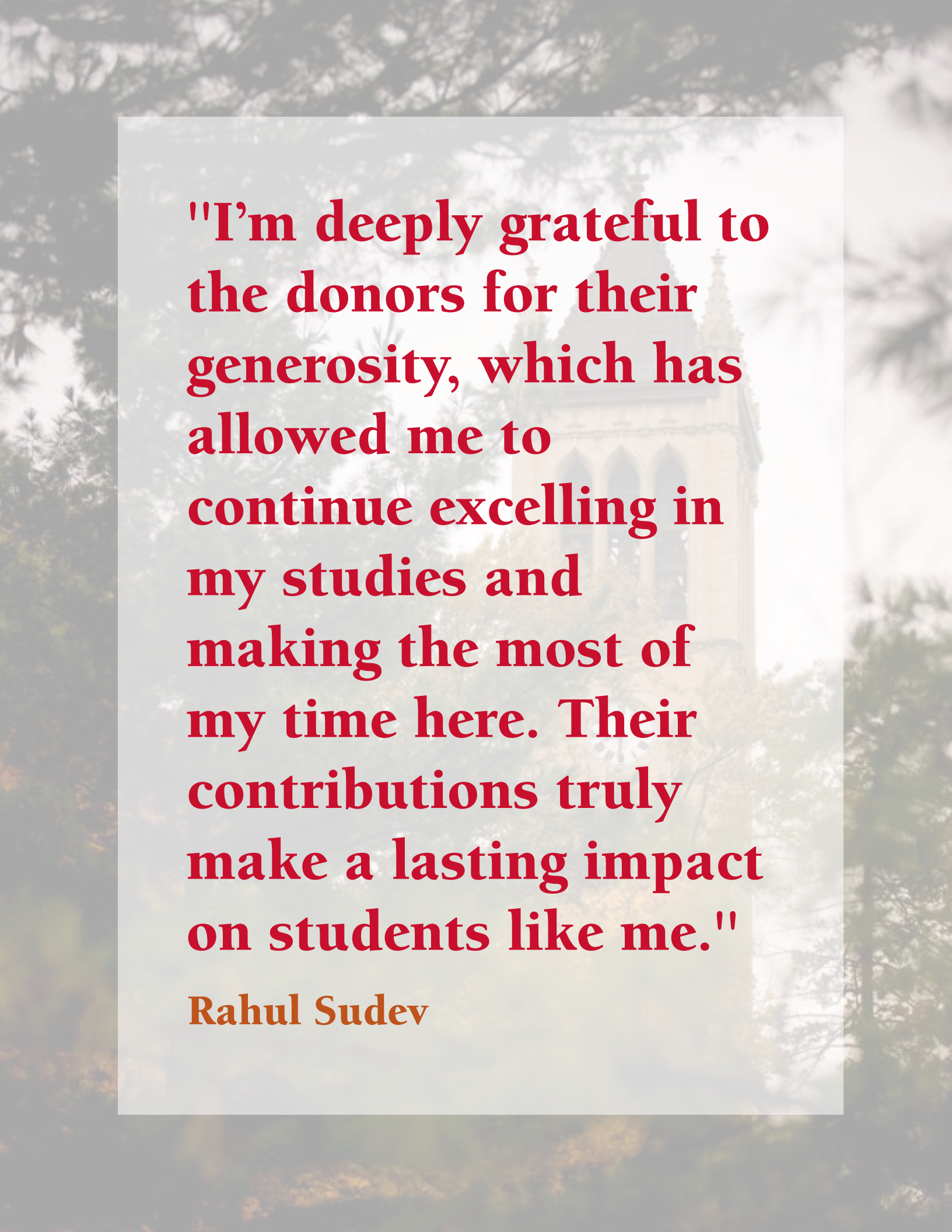
**3** papers accepted to **International Conference on Machine Learning (ICML 2024)**

**1** paper accepted to **International Joint Conference on Artificial Intelligence (IJCAI 2024)**

STUDENT  
**SCHOLARSHIP**  
IMPACT



Scholarships provide students opportunities that they otherwise would not have access to and can have a tremendous impact on their lives. Our students have shared the ways which they are thankful for the scholarships they have received.



**"I'm deeply grateful to the donors for their generosity, which has allowed me to continue excelling in my studies and making the most of my time here. Their contributions truly make a lasting impact on students like me."**

**Rahul Sudev**



"Receiving the Mark Giese Computer Science Scholarship has been a tremendous help in reducing the financial burden of pursuing my degree at Iowa State University. With this support, I was able to cover the cost of textbooks and allocate more funds toward tuition and other essential expenses. The scholarship has given me the freedom to focus on my academic and professional goals without the constant worry of finances. I'm deeply grateful to the donors for their generosity, which has allowed me to continue excelling in my studies and making the most of my time here. Their contributions truly make a lasting impact on students like me."

- Rahul Sudev

"Receiving scholarships has allowed me to prioritize extracurriculars and pursue research opportunities. These experiences have significantly enriched my academic journey and helped me prepare for a challenging and exciting career."

- Logan Ellsworth

"Receiving this scholarship has truly transformed my experience at Iowa State. It has helped with the financial burden and allowed me to immerse myself in my studies fully. I've been able to involve myself in clubs, seek internship opportunities, and focus on academic excellence without the stress of financial pressure. It has given me the freedom to explore my passions, and I am incredibly grateful for the opportunity. This support continues to make this journey possible for students like me, inspiring me to strive for the better."

- Issmale Bekri

**"Without these scholarships, I would not have been able to study at this fantastic university."**

**Ahana Ramji**

"Scholarships have made a huge difference in my journey at Iowa State University. They take the financial stress off my shoulders and give me focus on my studies and personal growth. It has empowered me to achieve my academic goals and further plan my career due to all the opportunities provided. It has been instrumental in helping me devote time to my coursework. I am deeply grateful to the donors who have made this opportunity possible, for such generosity allows students like myself to rise and follow our dreams."

- Nhu Phan




"Scholarships help under-privileged students like me to continue pursuing education. If it wasn't for scholarships that I have received over the years, my experience at Iowa State would be significantly more stressful. I'd constantly be burdened with financial stress, worrying about juggling part-time jobs on campus and full-time student classwork, and I wouldn't have had the time to enjoy my life on campus as a normal student. I really think that having these scholarships significantly increases the experience and quality of life for any student being supported with scholarships. Thank you."

- Jamey Nguyen

**"The financial support I received has truly allowed me to get the most out of my college experience."**

**Quinn Weidenaar**



"Scholarships have helped me to focus my time and effort on my classwork here at Iowa State. Because of scholarships, I do not have to worry as much about how I will pay back my loans. I am in a very fortunate position where I don't have to work during the semester, which has allowed me to spend more time on the experiences that Iowa State provides. I am forever grateful for the gratitude of scholarship donors who have made that possible for me."

- Dustin Cornelison

**"Scholarships help under-privileged students like me continue pursuing education... I really think that having these scholarships significantly increases the experience and quality of life for any student being supported with scholarships."**

**Jamey Nguyen**



For me, the impact that scholarships have allows me to pursue more opportunities that further not only my hard skills within the field of computer science, but also soft skills such as networking, leadership, and innovation. The financial relief scholarships provide lets me focus on my education and engaging with the community on campus.

- Jordan Rios



"The scholarships that I have received throughout my college career have significantly impacted me and improved my well-being. They have allowed me to commit more time to my academic career and given me the ability to attend things like supplemental instruction, clubs, and even join a sorority. Beyond this, they have given me the ability to focus time into myself and ensure that I'm properly taking care of my physical and mental well-being. Overall, the financial support I received has truly allowed me to get the most out of my college experience."

- Quinn Weidenaar



"I am very grateful to the Ana and Ed McCracken Computer Science scholarship and other university / departmental scholarships as it goes a long way in easing my financial hardships at Iowa State University. Without these scholarships, I would not have been able to study at this fantastic university. Further, all these scholarships inspire and motivate me to live up to the ideals and faith of the donors and guide me to give my best in my academic journey. A few of these scholarships also allow me to network with distinguished alumni and mentors as I carve my way through a challenging major and fulfil my potential to the best possible destination."

- Ahana Ramji

**"This support continues to make this journey possible for students like me, inspiring me to strive for better."**

**Issmale Bekri**

My name is Maya France, and I am a second-year student at Iowa State University, majoring in Data Science with a double minor in Entrepreneurship and Artificial Intelligence. The scholarships I have received have had a significant impact on my college experience, providing me with the financial support needed to focus on my studies and engage in numerous leadership and academic opportunities.

Thanks to these scholarships, I've been able to participate in programs like the BOLD Learning Community and STEM Scholars, both of which have helped me build a strong foundation for my future in data science and leadership. Additionally, I've had the opportunity to serve as a student assistant for the Start Something LAS Academy and as a member of the Liberal Arts and Sciences Advisory Council. These roles have enabled me to develop valuable leadership skills and network with peers and faculty, all without the added pressure of financial burdens.

Moreover, the financial freedom provided by these scholarships has opened doors for me to study abroad, allowing me to expand my horizons and gain invaluable global experiences.

Scholarships have truly transformed my university experience by allowing me to fully immerse myself in both academic and extracurricular pursuits. They have opened doors to new opportunities and provided me with the confidence to excel, which is why I believe continued support for scholarships is crucial for empowering students like myself to achieve their goals and make lasting contributions.

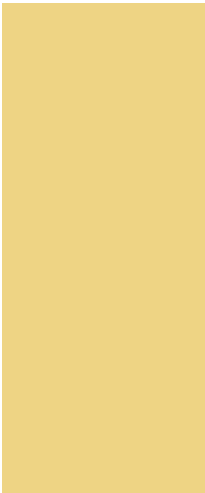
- Maya France



STUDENT

# Q&A

SUMMER INTERNSHIPS



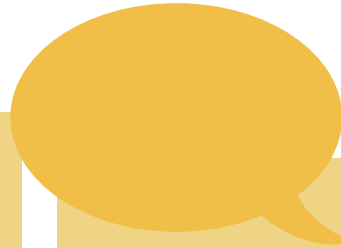
Providing crucial hands-on experience for students, summer internships pave the way for life-long success for our students. Hear from our students as they discuss their summer internship experiences from all around the United States.

# WHAT WAS YOUR FAVORITE THING ABOUT YOUR INTERNSHIP?



"I had the chance to connect with people from diverse backgrounds at the company, which was a great experience. The workplace had a welcoming atmosphere, with plenty of snacks provided, and employees often shared fresh produce from their summer gardens. I also got to ride a tractor for the first time when I helped another intern with note-taking in the field."

- **Srijita Chandra,**  
Interned at Syngenta



"Learn about the company and how I can contribute to the data science and analytics aspect of the project."

- **Geng Ding, Interned at John Deere Intelligent Solutions Group**

"Being around smart, hardworking people who will do whatever they can to help guide the projects, teach what you need to know, and make you feel welcomed. One of the healthiest work environment that I've been in."

- **Shaila Sharmin, Interned at Lawrence Livermore National Laboratory**

## WHAT IS ONE THING YOU LEARNED?

"You don't need to know 100% of everything to get started."

- **Blessing Ngara, Interned for Morgan Stanley**



## WHAT SURPRISED YOU THE MOST?

"Even as an intern, I took on responsibility for parts of the project, including outward-facing recruitment and presentation roles. This was surprising to me because I thought interns were usually siloed away doing their own project, but I enjoyed it as it forced me to produce great work and take ownership of my project."

- **Benjamin Steenhoek, Interned at Microsoft**

"The amount of different opportunities to get involved and stay active apart from just the regular work schedule (even as a remote intern)."

- **Eitan Tuchin, Interned at Verizon**

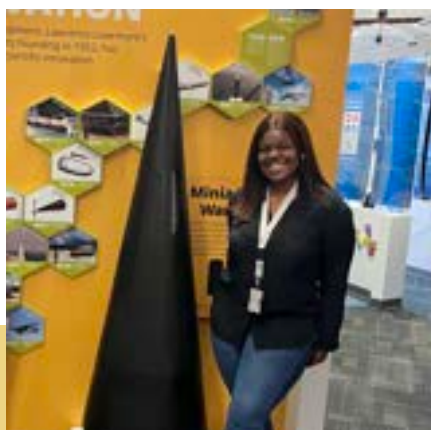
"I was amazed to know the immense potential of computer science, data science and mathematics in agronomy."

- **Saptarshi Biswas, Interned at SoilSerdem**

# WHAT IS ONE PIECE OF ADVICE YOU HAVE FOR STUDUENTS WHO ARE CONSIDERING DOING AN INTERNSHIP IN THE FUTURE?

"Don't be afraid to apply for an internship that is different from your focus of research, explore new fields and grow your network."

- Haniyeh Fekrmandi, Interned at Spartak Trading LLC



"Having good collaboration and presenting their work to others, making connections, and learning from industry professionals."

- Mahdi Banisharifdehkordi, Interned at Google

"Work hard and have fun!"

- Anwar Hossain Zahid, Interned at Lawrence Livermore National Laboratory

"My greatest piece of advice for future interns is to have confidence in exploring areas outside your immediate research domain, especially in your first year. It can be tempting to focus solely on your specific project or field, but stepping outside of your comfort zone and engaging with other teams or topics can be incredibly valuable. Don't hesitate to attend talks, collaborate with peers in different areas, or even pick up new skills that may seem unrelated to your primary work. As this gave in an opportunity to explore HPC which wasn't initially my primary interest."

- Chiamaka Igwilo, Interned at Lawrence Livermore National Laboratory







# AWARD WINNING FACULTY

OUR FACULTY HAVE CONTINUED TO PRODUCE WORLD CLASS RESEARCH AND MAKE POSITIVE CONTRIBUTIONS TO OUR COMMUNITY. LEARN ABOUT THE WAYS THEY ARE MAKING AN IMPACT – FROM REVOLUTIONARY RESEARCH TO OUTSTANDING OUTREACH PROGRAMS AND ACTIVITIES.

## Navigating Security Challenges for Ensuring User Privacy with Machine Unlearning



**MENGDI HUAI**  
Assistant Professor

Personal data is constantly being collected, analyzed, and stored by companies. Individuals are increasingly concerned about who has their data and how it is being used – which has led to some regulatory changes to give people more control over who has their data. As privacy laws continue to grant individuals the right to be forgotten, people can require that companies delete their data by enacting their right to be forgotten. Companies are using machine learning (ML) techniques to eliminate the data from their models to comply. These techniques involve modifying the machine learning models to remove the data without requiring the entire model to be retained from scratch.

However, the state-of-art unlearning methods can create new vulnerabilities that attackers may exploit and gather sensitive personal information. The work in machine unlearning is still in its early stages. Existing studies on this technique mainly focus on enhancing unlearning effectiveness and efficiency, neglecting the security challenges introduced by it.

Some users who contribute training data may have malicious intentions – executing attacks by submitting misleading unlearning requests to induce malicious behavior in the model. Researchers such as **Mengdi Huai**, Assistant Professor of Computer Science at Iowa

**Machine unlearning aims to erase data from a model and generate an unlearned model without needing to retrain it from scratch. Machine unlearning, or selective forgetting, empowers individuals to request the removal of their data from AI systems, enhancing their privacy protection.**

State University, are working to tackle that problem.


Huai's research focuses on understanding and mitigating these vulnerabilities. She aims to develop novel techniques to build trustworthy learning systems that are explainable, robust, private, and fair.

"In an era where data usage and protection concerns are intensifying, securing the unlearning process is imperative," said Huai.

Her research is gaining significant recognition, being published at top-tier conferences such as the 37th Conference on Neural Information Processing Systems (NeurIPS 2023) and receiving a \$300,000 grant from the National Science Foundation.

Amid escalating concerns about data usage and protection and recent regulations such as the California Consumer Privacy Act, ensuring that artificial intelligence models can comply with regulations is not only a legal requirement but a necessary step to build systems that handle personal data with the utmost care and consideration. By improving the security and privacy of machine unlearning methods, Huai's research will help protect individuals' data from unauthorized access and misuse and will strengthen the privacy rights of everyday users. Overall, her work will lead to a more secure and privacy-respecting world for everyone.





**"In an era where data usage and protection concerns are intensifying, securing the unlearning process is imperative"**

**Mengdi Huai**

## Revolutionizing Safety Testing for Legged Robots



**BOWEN WENG**  
Assistant Professor

Think about when someone is going on a hike. Humans have an innate ability to adapt to the ever-changing environment we encounter along the trail. We navigate rougher terrain, adjust to steeper inclines, appropriately respond to unpredictable wildlife, and circumvent fallen tree branches without too much thought.

However, the hike would not be quite so effortless for a robot. Robots use programmed algorithms and mechanical systems to perceive and respond to their surroundings. Reacting to those things for robots is complex and goes beyond a mathematical formula.

Besides getting the robot to go on the hike, one of the goals for the robot is to be able to be integrated alongside other humans. Now, imagine a robot with legs going on the hike alongside yourself. How can you ensure that it's safe for you to interact with?

In an ideal world, the robot would have undergone tests – like we do with cars or any other type of machinery. However, the unique operating mechanisms of legged robots mean that it is difficult to create standardized testing methods. Different-legged robots operate in a variety of manners, leading to differences in their structures and movement patterns. Therefore, there's no one way to test them and that is why ensuring their safety is a challenge - one that researchers such as **Bowen Weng**, Assistant Professor in the Department of Computer Science at Iowa State University, are working on solving.



Scan the QR code to watch a video demonstrating his research.

“To the best of our knowledge, legged robots have not led to any known fatalities across the world,” Weng said while discussing the long-term implications of his research. “We would like to keep it that way, and even if this is statistically inevitable, we would like to do as much as possible to delay the occurrence of that moment.”

So, how does Weng go about trying to ensure that the robots he's working on are safe for human interaction?

“I work on two (contradictive) safety perspectives safety perspectives of legged robots,” Weng added when explaining his research. “On the one hand, I build safe robots from a developer's perspective. On the other hand, I also build testing frameworks to check and ensure the developer's claim from a third-party point of view.”

Introducing an innovative approach to safety testing for legged robots, his paper “On Safety Testing, Validation, and Characterization with Scenario-Sampling: A Case Study of Legged Robots” was accepted to the IEEE/RSJ International Conference on Intelligent Robots and Systems 2022 (IROS 2022). IROS is one of the largest and most prestigious conferences in robotics, providing a platform for researchers, engineers, and practitioners to present their latest research findings in robotics and automation.

In the paper, they suggested a new way to test a robot's safety. They proposed a method that involves testing the robot in a few different scenarios – allowing us to understand specific conditions where the robot is safe and how safe it is in those conditions. Such a framework can ensure that a robot is safe for use in the real world alongside humans and allow researchers to compare the safety performance of different-legged robots with different structures and ways of moving.

To test their proposed method, Weng and his team applied it to various advanced-legged robots – such as those that use dynamic models, deep neural networks, and reinforcement learning. They also accounted for different terrains, such as moving on slopes (like up and down hills), sudden changes in speed, and handling unexpected disturbances. Their results show that their method is an effective way of assessing the overall safety and performance of the robots.

Weng and his team continued the research on testing algorithms for general robots with the IEEE Transactions on Robotics paper “On the Comparability and Optimal Aggressiveness of the Adversarial Scenario-Based Safety Testing of Robots.” They challenged the idea that prioritizing high-risk scenarios improves testing efficiency.

“We essentially showed there is a “No-Free-Lunch” theorem in safety testing. The NFL theorem is a classic concept and topic in searching algorithms and optimization,” explained Weng. Further research was conducted, as presented in the paper “Towards Standardized Disturbance Rejection Testing of Legged Robot Locomotion with Linear Impactor: A Preliminary Study, Observations, and Implications,” which was accepted to the IEEE International Conference on Robotics and Automation (ICRA) 2024, the flagship conference in robotics. In the paper, Weng uses a linear impactor to create disturbances that test how well a legged robot can handle unexpected situations. The linear impactor works to standardize testing as it is equitable to all-legged robots, can be repeated, and is adaptable. Their results showed that using the linear impactor is a promising way to evaluate and compare the ability of legged robots to handle disturbances.

The research was conducted in collaboration with Guillermo Castillo, a Ph.D. student from the Department of Electrical and Computer Engineering at The Ohio State University, Yun-Seok Kang, an Associate Professor from the Division of Health Sciences in the School of Health and Rehabilitation Sciences at The Ohio State University, and Ayonga Hereid, Assistant Professor in the Department of Mechanical and Aerospace Engineering at The Ohio State University.

Weng's research on testing legged robot safety and establishing safety is highly regarded. Outside of his research, he is working on defining the future of safety standards with ASTM International. This international standards organization develops and publishes technical standards for various materials, products, systems, and services. Weng chairs ASTM Subcommittee F45.06 Legged Robot Systems.

The new subcommittee works on developing standards and testing procedures to evaluate the performance of mobile robots that primarily rely on articulated limbs and legged mechanisms to move around. As a result, the standard will provide testing methods and performance metrics. These metrics can then be used to help lay the groundwork for regulatory frameworks that will uphold high standards of safety and accountability – an important first step in making sure that our future is safe.

Weng's commitment to ensuring the safety and well-being of individuals in an increasingly automated world will be crucial for shaping a safe and sustainable future where humans and robots can live in harmony. With his work, we can engage with legged robots, whether on a hiking trail or in the workplace, knowing they are safe for us to interact with.

**“To the best of our knowledge, legged robots have not led to any known fatalities across the world. We would like to keep it that way.”**

## Presenting on Algorithmic Fractal Dimensions



**JACK LUTZ**  
Professor

From May 20 to 24, 2024, the NSF-CBMS Regional Research Conference in Mathematical Sciences at Drake University in Des Moines, Iowa, featured a series of ten lectures by Professor **Jack Lutz** from Iowa State University's Computer Science department. Lutz delivered two lectures each day, focusing on Algorithmic Fractal Dimensions.

These lectures drew from Lutz's extensive writing and research, enriched by insights from his esteemed colleagues. Lutz aimed to highlight the significant impact of Algorithmic Fractal Dimensions as powerful tools that drive fascinating discoveries across various fields within computer science and mathematics.

The lecture series was hosted by Christopher Porter, Associate Professor of Computer Science, Director of the Artificial Intelligence Program, and Co-Chair of Drake University's Mathematics & Computer Science Departments. This event was made possible through a collaboration between the National Science Foundation and the Conference Board of Mathematical Sciences, which supports conferences on current research topics in mathematical sciences.

The conference's lecture series began with an introductory session that explored classical Hausdorff and packing dimensions, providing the essential backdrop for the ensuing in-depth discussions.

The lectures ventured into the concept of effectivization, illustrating how it could be employed to define algorithmic versions of classical Hausdorff and packing dimensions.

Lutz highlighted the pragmatic utility of these dimensions and illuminated their role in amalgamating the Hausdorff dimension with subsequent information theories developed by Shannon and Kolmogorov.

Algorithmic dimensions were employed to formulate fresh perspectives on the dimensions of individual points within Euclidean space. Special attention was devoted to the Point-to-Set Principle, renowned for its unexpected applications in the domain of geometric measure theory.

Extending beyond the confines of pure mathematical theory, the lectures charted a course toward broader horizons. They delved into the expansive landscape of applications, encompassing computational complexity, information theory, and the intricate examination of Borel normal numbers. The conference fostered an interactive platform featuring open problem sessions and engaging discussions, facilitating the exploration of additional insights and collaborative opportunities.

Now that the conference is over, Lutz is working on a book on Algorithmic Fractal Dimensions, which the NSF-CBMS conference will publish. This forthcoming book will provide a structured and in-depth exploration of Algorithmic Fractal Dimensions, underling their profound significance in contemporary mathematics and computer science.

"The lectures and the book will highlight the unity and the beauty of this rapidly sprawling field," said Lutz when asked about the conference prior to presenting, emphasizing his commitment to celebrating the coherence and elegance that define Algorithmic Fractal Dimensions.

## Advancing STEM Education: Committing to STEM Outreach



**ADISAK SUKUL**  
Assistant Teaching Professor

Committed to advancing and expanding computer science activities, for faculty members such as **Adisak Sukul**, this goes beyond the traditional classroom setting. Dr. Sukul, an Assistant Teaching Professor in the Department of Computer Science, not only teaches in the classroom throughout the year, but also teaches outside of the classroom through various initiatives aimed at broadening participation in the field. Two of the initiatives are the the Dependable Data Driven Discovery Bootcamp and Data Science and AI Workshop for Energy Solution.

An initiative that Sukul provides summer instruction to students is with the Dependable Data Driven Discovery (D4) Bootcamp. Beginning in late June and ending in early August, the bootcamp is designed for graduate students in all STEM disciplines interested building a career in data science, Artificial Intelligence, and machine learning.

The boot camp allows students to build up the necessary skills to eventually go onto join graduate-level courses as part of a traineeship where they can continue to learn about trustworthy data science. Gaining hands-on experience solving real world problems, the course is offered by online and in-person, with focus on team building, leadership, and professional development.

The goal of the bootcamp is not only to prepare students as they prepare to embark on a new journey, but also to provide students with skills that will be necessary in their future careers.

Another of the initiatives that Sukul worked with this past year is the RENEW Pathway Summer School, Data Science and AI Workshop for Energy Solutions. Held from May 20 – June 21, 2024, the five-week workshop provides training and mentoring to students in data science through active learning opportunities. Students are introduced to data science methods, and they are helped to build a STEM identity through a supportive learning environment and engagement with DOE research and scientists. It also serves as an opportunity to introduce students to the science at Ames National Laboratory.

“Throughout the workshop, we get to explore and try all the fun state-of-the-art techniques and tools in data science, machine learning, and AI,” explained Sukul.

The workshop was held as a result of a collaboration between the Department of Computer Science and Ames National Laboratory, with Sukul working alongside Kelly Bergman, Ames National Laboratory’s Education and Outreach Program Manager.

“As the nation’s population continues to diversify, inclusion of underrepresented populations in STEM education and the STEM career pipeline is imperative,” said Bergman. “The workshop is designed to help underrepresented students in STEM build a STEM identity and gain valuable skills to help them persist and succeed in their chosen major.”

“Students mentioned that the workshop was beneficial and that they could apply their skill sets and ideas to their projects right away,” Sukul added.



(above) The Dependable Data Driven Discovery co-hort visiting Corteva.

## Shaping Future Data Science Leaders: The D4 Traineeship



**WALLAPAK  
TAVANAPONG**  
Professor

Entering its 2nd year, the Dependable Data Driven Discovery (D4) program, led by Dr. **Wallapak Tavanapong**, Professor of Computer Science at Iowa State University, has just graduated its first cohort of students. This three-semester traineeship is open to students pursuing graduate or concurrent BS/MS degrees at Iowa State University. It kicks off with a bootcamp, before progressing through coursework, research experience, mentorship experience, seminars, and industry experimental learning experience.

Trainees learn to spot risk and make sure data science lifecycles are trustworthy – looking at everything from the planning and gathering of data to managing, analyzing, and drawing conclusions from it. They conduct research to boost the reliability of these processes and collaborate with experts in biological sciences and bioengineering to make data-driven decisions. Current and past trainees have come from a variety of fields such as Agronomy, Computer Science,

Bioinformatics & Computational Biology, Human Computer Interactions, Statistics, Chemical and Biological Engineering, Civil, Construction and Environmental Engineering, Computer Engineering, Education, Genetics, Development and Cell Biology, Mathematics, and Veterinary Microbiology & Preventive Medicine – with the traineeship focusing on producing a new generational of biological data scientists, biomedical engineers, and data scientists.

Trainees also explore the real-world applications of data science, tackle ethical issues that come up, and make smart ethical choices. Additionally, they share their knowledge, research, and findings with stakeholders and work in multidisciplinary teams. Currently, the traineeship continues to grow, looking for students for their 3rd cohort. With a focus on students from underrepresented backgrounds, and interdisciplinary research, the NRT training program is an excellent opportunity for students from diverse backgrounds to grow their skillset and knowledge.

By the end of the program, trainees are well-prepared to take on the challenges of the data science field with confidence and integrity. Graduates of the program will be knowledgeable, skillful, and ethically informed data scientists who are able to contribute to the increased awareness of trustworthy data science for industry partners, non-profit organizations, government, high school students and teachers in Iowa, and the community around them.

## The High School Programming Competition and AI Jumpstart

On Saturday, April 27th, the Department of Computer Science at Iowa State University hosted its first annual High School Programming Competition. Students from throughout the state came to campus and competed. Computer science faculty, Teaching Professor **Simanta Mitra**, Teaching Professor **Gurpur Prabhu**, and Assistant Teaching Professor **Jeremy Shaeffer** hosted the event.

“The inaugural high school contest held in Spring 2024 was well-received,” said Program Coordinator, Teaching Professor Simanta Mitra. “While the students engaged in the programming challenges, we offered their coaches a unique professional development opportunity through a three-hour AI Jumpstart Workshop. Thus, this event not only fostered a competitive spirit among the high school students but also enriched the coaches' knowledge and teaching repertoire.”

Six computer science faculty and four graduate trainees from the Dependable Data Driven Discovery



(above) The students, teachers, and faculty participating in the first annual high school programming competition.

(right) The teachers and faculty participating in AI Jumpstart.



National Research Traineeship collaborated with four high school computer science teachers in support of the CS4ALL initiative to advance computer science education in the Midwest and challenges of teaching responsible AI concepts.

The AI Jumpstart workshop featured a working lunch, interactive offline games, expert talks, and lab visits centered around puzzles, discrete math, and robotics. Teachers were given a tour of the Autonomous Systems Lab, an introduction to large language models, a teaching demo of an offline large language model game, and a discrete math and robot workshop. Teachers were introduced to Go2, the department's resident robot dog and were delighted to go home with a Go2 selfie and some educational handouts to share with their classes.

The event concluded with a focus group discussion to explore collaborative efforts between CS faculty and high school teachers, aiming to drive real and meaningful change in the mission of CS4ALL. Computer science faculty, **Bowen Weng** (Assistant Professor), **Qi Li** (Assistant Professor), **Wallapak Tavanapong** (Professor), **Chris Quinn** (Assistant Professor), **Tichakorn Wongpiromsarn** (Assistant Professor), and **Soma Chaudhuri** (Associate Professor) all participated in the event, along with School of Education Associate Professor, E.J. Bahng.

The day connected the department with regional high school teachers and students. The teachers and students all enjoyed the event, expressing gratitude for seeing the campus and the department. They all looked forward to further participation in the future.







# OUTSTANDING

## ALUMNI

HEAR FROM OUR STUDENTS AS THEY  
SHARE THEIR EXPERIENCES AT IOWA  
STATE UNIVERSITY.

# Meet Kathryn Rohlfig ('22).

Kathryn, who graduated in 2022 with a BS in Computer Science and a minor in Spanish, has fond memories of her time at Iowa State.

Reflecting on her experience, Kathryn recalled her involvement in undergraduate research and having the opportunity to present at several conferences.

“It was a really neat experience and a great opportunity to learn what it’s like to work on a project long-term, well beyond what you can normally do for class,” she shared.

Besides working in undergraduate research, she participated in the peer mentor program and the Science Explorations club.

Outside of class, one of her favorite memories was visiting a coffee shop, which became a ritual when she needed a break, such as decompressing after a stressful exam or when she was nervous about an interview.

Kathryn’s decision to attend Iowa State was influenced by her family’s legacy at the university. She connected to the institution with relatives who were alumni and faculty members. However, she initially had reservations about staying close to home. “I wasn’t sure if I wanted to branch out and go someplace new, but with the campus, a great computer science program, tons of help getting a job afterward through things like the career fair, and all the hands-on research opportunities, it’s hard to beat,” she explained.

When asked why she decided to study computer science, she said that her commitment to working in STEM and wanting a variety of topics to study decided for her.



“I had a hard time deciding what I really wanted to do when I was in high school and looking at colleges. But, I wanted to do something in a STEM field and really liked how many different options there are within computer science, both for specialties and for careers. I think I made the right choice, as I definitely love it now and it’s a field that’s hard to get bored of when there are so many options and so many new technologies developing all the time.”

After graduation, Kathryn began working at Capital One in Dallas. She joined through their Technology Development Program, which allowed her to rotate teams after a year to understand better what she wanted to do.

Because of her experiences both in and out of the classroom, Kathryn is well-prepared for her career.

“I feel like Iowa State prepared me incredibly well both with the technical class content and with the softer skills like knowing when to ask for help as I’m stuck on a problem, or how to bucket time for everything that I need to complete in a day to make sure the most important things get done and I still have time for myself,” she noted.

Kathryn also highlighted the value of her capstone project classes and upper-level electives. “The capstone project classes have been especially handy, and the upper-level electives like Dr. Cohen’s course on automated testing have been great to showcase now in my career and have given me some of the best opportunities to get more involved at work.”



**"With the campus,  
a great computer  
science program...  
and all the  
hands-on research  
opportunities,  
[Iowa State  
University is] hard  
to beat"**

**Kathryn Rohlfing**

# GRADUATE SPOTLIGHT



**"Studying at Iowa State was the best decision of my life."**

## Meet Adithya Kulkarni ('24).

Adithya Kulkarni, a first-generation graduate from India, has always been a natural problem solver. His early love for puzzles and innovative solutions led to him to get a degree in computer science, which culminated in a PhD in computer science from Iowa State University. He studied data mining, machine learning, and language processing – aiming to develop effective and scalable algorithms and methods to obtain high-quality annotations for large and complex data. Through his research, he considers the fundamental problems and tackle diverse real-world challenges.

Adithya initially joined Iowa State University as a master's student. He soon decided to pursue a PhD to achieve his research goals. His success in research and teaching is reflected in some of his happiest memories, such when his first paper got accepted or when he received the Teaching Excellence Award. The supportive community around him also contributed positively to his experiences. He has fond memories of spending time with friends and enjoying the beautiful spring weather here in Ames.

While Adithya chose Iowa State University because of our research opportunities and strong academic program, he found success through the supportive community he built.

"My course instructors, especially Dr. Pavan Aduri and my PhD advisor, Dr. Qi Li, were instrumental in shaping my career trajectory. Their motivation helped me succeed in my PhD journey," he says. "They were incredibly supportive and helped me during distress. Their knowledge and guidance motivated me to aim higher. Furthermore, student services and staff at the university guided me through every step of my study at Iowa State University and helped me achieve my goal. Iowa State University also helped me build a professional network, which helped me achieve my dream job."

Today, Adithya is a postdoctoral fellow at Virginia Tech, working with Dr. Dawei Zhou and Dr. Lifu Huang. Reflecting on his experience, he states, "Studying at Iowa State was the best decision of my life."

**"The faculty members are renowned for their expertise, and the collaborative environment of the university allowed me to work with brilliant minds in the research community. The resources and facilities available to students for conducting research are exceptional at ISU."**

# GRADUATE SPOTLIGHT

## Meet Eshita Zaman ('24).

Eshita Zaman graduated in 2024 with her Ph.D. in Computer Science from Iowa State University. Her area of research is probabilistic model checking – which is a formal verification technique used to ensure systems behave reliably under uncertainty.

“I find this field fascinating because so many modern systems, like autonomous vehicles, information-flow security policies, cybersecurity protocols, rely on probabilistic behaviors,” explained Zaman. “By using probabilistic model checking, we can mathematically verify that such systems meet certain performance or reliability standards ensuring safety and



effectiveness. The ability to contribute to enhancing the trustworthiness of critical systems makes this research area both exciting and impactful.”

Currently, Zaman works as a teaching faculty at Utah Valley University in the Department of Computer Science. She credits Iowa State University for her career readiness.

“The challenging academic program gave me a solid foundation in computer science concepts, while the research opportunities sharpened my problem-solving and analytical abilities. Additionally, working as a graduate instructor provided valuable teaching experience, enabling me to effectively manage and engage with large groups of students. Beyond technical expertise, ISU also helped me build essential soft skills like communication, leadership, and teamwork, which are crucial for thriving in any professional environment.”

Besides excellent career preparation, she found that Iowa State had a lot of other positive things to offer as well – noting the beautiful campus in the early summer and fall, the strong sense of community, and the friendships she formed with students both within and outside the department.

“I chose Iowa State University because of its strong reputation in research and innovation within the field of computer science. The faculty members are renowned for their expertise, and the collaborative environment of the university allowed me to work with brilliant minds in the research community. The resources and facilities available to students for conducting research are exceptional at ISU.”

She added, “Iowa State truly became my home away from home, and it was the incredible people who made my time there so special.”

## Welcome Sarah Schinckel to the External Advisory Council

Sarah Schinckel has joined our External Advisory Council. She is the director of emerging technologies and architecture in the Intelligent Solutions Group (ISG) at John Deere. Her team sets the technical vision for future products and helps the organization achieve that vision through design, research, and prototyping. Sarah has over 20 years of experience in software and technology and has worked in a variety of roles across development, systems engineering, and engineering management. Sarah earned her bachelor's degree in computer science and a master's degree in engineering management from Iowa State University and has graduate certificates from Iowa State University and the Massachusetts Institute of Technology. Welcome!



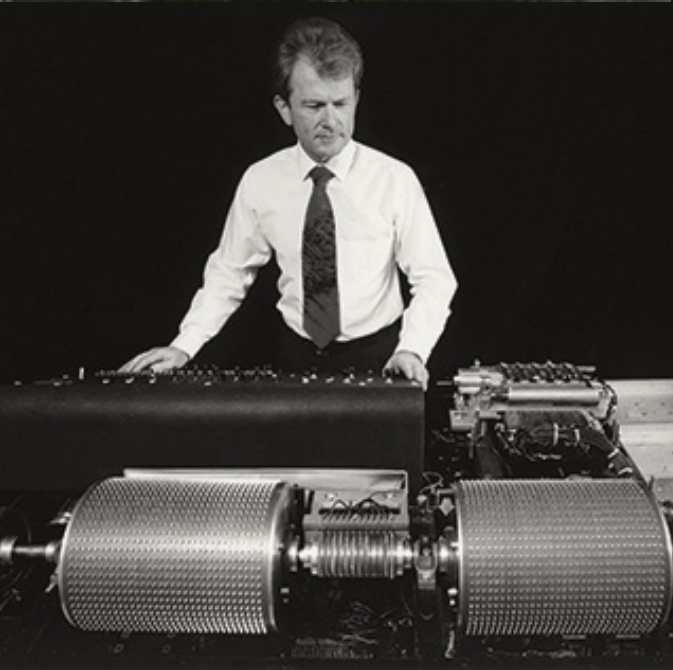
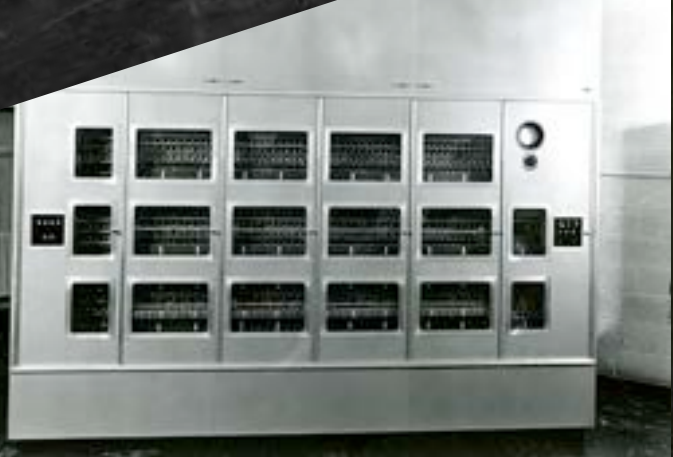
## Srinu Namineni Awarded the 2024 Distinguished Alumni Award

The Department is thrilled to honor Srinu Namineni ('91) with the 2024 Distinguished Alumni Award.

Srinu Namineni is Senior Vice President of Strategic Growth Operations at Cisco. He has led teams through complex integrations, significantly driving growth and efficiency throughout his 25+ years of experience. His strategic insight and engineering foundation have pushed him to the forefront of the global technology industry throughout his career. Prior to Cisco, he was VP Finance & Strategy at Salesforce, and has served in leadership roles at IBM and as the co-founder of a web startup.

Srinu holds a Master of Computer Science from Iowa State University, Master of Business Administration from The Wharton School, and Bachelor of Computer Science from Jawaharlal Nehru Technological University.

Congratulations Srinu!



# IOWA STATE UNIVERSITY

## Department of Computer Science

226 Atanasoff Hall  
2434 Osborn Drive  
Ames, IA 50011



# MOVE

# WHAT

# MATTERS

*Be part of something bigger. Make a gift online at [www.isuf.info/givetocomsci](http://www.isuf.info/givetocomsci) or call 866.419.6768*

For more information about our status as a non-profit 501(c)(3), visit [www.isuf.info/disclosure](http://www.isuf.info/disclosure).

IOWA STATE  
UNIVERSITY  
FOUNDATION