

# ATANASOFF TODAY

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**IOWA STATE UNIVERSITY**  
Department of Computer Science



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# DEAR FRIENDS *of the department,*



The Department of Computer Science is coming off of an unprecedented year. I send my deepest thanks to all members of faculty and staff who have contributed to the success of the past year. From launching the master's program in artificial intelligence to the myriad of awards received, we have a lot to be proud of.

## CONTINUED EXCELLENCE

Our department continues to be at the forefront of evolving technologies such as artificial intelligence, cyber security, cloud computing, data science, software engineering and more. This year, we saw a boost in enrollment which will undoubtedly add to the momentum of our success.

I would be remiss if I didn't mention the great loss we suffered since our last edition. In February, we lost our beloved colleague and educator, Professor Giora Slutzki. Giora dedicated his life to the university during his long career at Iowa State and his absence leaves an irreplaceable imprint on the fabric of our department. We are very

interested in memorializing Dr. Slutzki's illustrious career with the department; please do reach out to me with your ideas.

## NEW OFFERINGS

Despite the hardships the last few years dealt, we have a lot to celebrate. In June, the Board of Regents approved the state's first master's program in artificial intelligence. Our department recognized the explosive growth of A.I. technology and is taking significant steps to educate and train future A.I. scientists and professionals. I look forward to all that is to come for this new avenue.

This summer we gathered to celebrate the retirement of Johnny Wong, Professor Emeritus, who dedicated many years of service to the department during his expansive career. Johnny helped our department get to where it is and we wish him all the best during his well-deserved retirement.

## FACULTY ACHIEVEMENTS

Since our last magazine, we have welcomed two new members of faculty: Matthew Tan Creti and Abusayeed Saifullah. Matthew joins us as an Assistant Teaching Professor and Abusayeed as an Assistant Professor. They have both been great additions to our department and continue our tradition of hiring outstanding faculty.

Our department is home to world-class computer science faculty, who have achieved incredible new heights over the last year.

For starters, Adisak Sukul was selected as a Google Faculty Expert, Jin Tian was invited to join the Simons Institute Program at Berkeley, Wei Le received a grant from the Software Engineering Institute at the Carnegie Mellon University, Hongyang Gao received an NSF grant, and Robyn Lutz won a Lifetime Service Award from the IEEE Conference, just to name a few.

## PRIORITIES

Since its opening in 1969, Atanasoff Hall has served us well; however, the facilities are now in need of significant improvements as the department has grown both in size and in research activities. Thus, improving our current facilities in Atanasoff Hall continues to be at the top of our agenda.

Heading into the next year, our priorities remain the same. We are pursuing growth in quantum information science, autonomy and smart one precision health, a digital amalgamation of medical, environmental and genetic data to provide predictive and responsive health care. We also remain dedicated to recruiting experts to lead initiatives in trustworthy A.I.

I hope you enjoy reading about our accomplishments from the last year and I look forward to all that is to come. Your support is always appreciated.

**HRIDESH RAJAN**

Professor and Chair,  
Dept. of Computer Science

# INVESTING IN *students*



In an era of staggering student debt, donor support is critical to help students reach their academic goals. This year, undergraduate and graduate students received more than \$20,000 in scholarships. The individual scholarship amounts vary, but the spirit of support is tantamount.

Kordell Schrock, recipient of the Arthur A. Collins Education Fund, is thankful for the scholarship donors who make it possible to get his degree, which he plans to use to give back to his community. “My ultimate goal is to become a successful entrepreneur. I hope to invent the next generation of computer businesses that will affect Native American communities dramatically by retaining wealth within the communities and providing more opportunities.”



Megan Severson also wants to use her degree to give back to others. “I hope to have a career in software development while also being able to motivate and inspire younger generations of females to pursue a career in the field of technology. Thanks to the donor’s financial assistance, I will be able to stay motivated to achieve those goals without having to worry about paying off student loans.”

Aubrey Uriel Sijo-Gonzales is thankful for the alleviation of burden the scholarship provides. “I consider myself lucky to work in a field that not only allows me to pursue my passions, but to also use my capabilities as a developer to serve my community. Scholarships further inspire me to become a capable developer and an effective collaborator.”



“

**I CONSIDER MYSELF LUCKY TO WORK IN A FIELD THAT NOT ONLY ALLOWS ME TO PURSUE MY PASSIONS BUT TO ALSO USE MY CAPABILITIES AS A DEVELOPER TO SERVE MY COMMUNITY.**

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Jasper Khor, recipient of the Arthur A. Collins Education Fund, has big plans for his degree and is thankful for the scholarship to make it possible. "I hope to utilize what I learned in computer science to develop an artificial intelligence-based software program to help my brother, who has learning difficulties, learn. The scholarship award will help me focus on my studies."

Jason Brittain, recipient of the Charlie and Barb Hunt Scholarship, returned to school after 25 years in the professional field. In the wake of the pandemic, he decided to make the leap and fulfill a longtime dream of his, to return to school for a degree in computer science. "Needless to say, my life has quite a few moving parts," said Brittain. "Every bit of support helps make a truly challenging scenario that much easier, and this scholarship gift makes a huge difference as I work towards achieving my goals."

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**I'M THANKFUL FOR THIS  
SCHOLARSHIP FOR HELPING ME  
ACHIEVE MY GOALS, MY VISIONS,  
AND MY DREAMS.**

”

Alex Huynh, one of the recipients of the Arthur A. Collins Education Fund, has big dreams for post-college. "My work towards realizing stronger and more advantageous quantum algorithms will be sure to leave a mark on the world, and I'm thankful for this scholarship for helping me achieve my goals, my visions, and my dreams."

# BRINGING SOFTWARE TO LIFE

## *with artificial intelligence*

Ever wonder how social media accounts like Twitter and Facebook personalize your feeds with information synced with your interests, or how Google maps and other travel apps expertly guide you to your next destination? The answer is artificial intelligence, or A.I., and we encounter it daily without giving it a second thought.

The Department of Computer Science is continuing to provide its students with the most cutting-edge education possible by rolling out a master's degree in artificial intelligence.

### GROWING DEMAND

"There is great demand for artificial intelligence experts today, both in Iowa and nationally, and the job market is growing quickly," said Beate Schmittmann, Dean of the College of Liberal Arts and Sciences. "By offering this innovative graduate program, Iowa State University recognizes the extraordinary need for A.I. scientists and professionals, and LAS is well prepared to offer an exemplary program through our excellent computer science department."

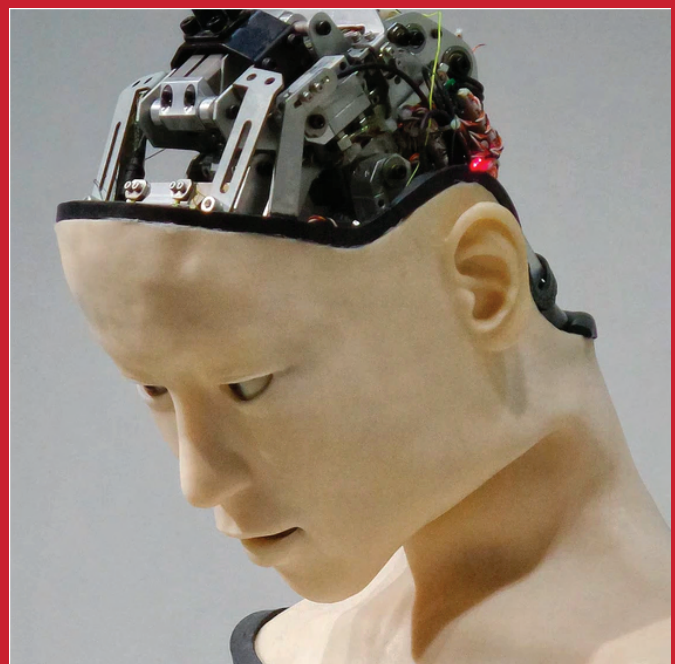
In March 2018, the job website Indeed reported that employer demand for A.I.-related positions more than doubled over the previous three years. Executives at career-networking website LinkedIn said A.I. skills on the site increased 190% from 2015 to 2017, and that A.I. demand is quickly spreading beyond the tech industry. In 2020, some of the top AI fields including

healthcare, education, marketing and human resources. Udemy, a leading global marketplace for learning and instruction, predicts a robust demand for A.I. and data science skills now and in the future.

"A.I. professionals will be demanded not only in the tech industry but far beyond in healthcare, finance, personalized education, media and entertainment, more effective agriculture, more efficient manufacturing, safer transportation and much more," said Jin Tian, Associate Professor of computer science.

### WANTED: TECH-SAVY STUDENTS

Iowa State's A.I. program will target graduate-level students with strong quantitative backgrounds who are interested in learning basic A.I. and machine-learning techniques. The curriculum will consist of core classes in both those areas as well as knowledge representation and reasoning, search and planning, computer vision and perception, natural language processing and robotics.



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**THERE IS GREAT DEMAND FOR  
ARTIFICIAL INTELLIGENCE EXPERTS  
TODAY, BOTH IN IOWA AND  
NATIONALLY, AND THE JOB MARKET IS  
GROWING QUICKLY.**

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“The courses are designed to provide students with the knowledge and core skills needed to apply A.I. and machine-learning techniques to address a wide range of practical problems,” said Hridesh Rajan, Kingland Professor of Data Analytics and Chair of the Department of Computer Science.

### **INDUSTRY LEADING OPPORTUNITIES**

Currently, no other Iowa universities or colleges offer an A.I. graduate program. Rajan is confident that Iowa State’s new program will draw students to the university from all corners of the globe.

“We believe this new program will attract new students to Iowa State. For instance, during a recent international university visit, we had several inquiries about whether we have an A.I. master’s of science degree,” Rajan said.

Rajan anticipates a small number of students to enroll in the program initially, eventually growing to about 80 graduate students after eight years.

### **HISTORY OF EXCELLENCE**

Iowa State’s long history in developing data-driven sciences provides a solid foundation for the A.I. graduate program. Solving the

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world’s most pressing societal problems with the help of data-driven research is a top priority for the university, as evidenced in Iowa State’s Destination 2050 campaign.

According to the website, “Destination 2050 brings into focus the enormous capabilities and global recognition of Iowa State University to meet the challenges of the next generation. Our big data-driven breakthroughs today will lead to more breakthroughs in the months and years to come.”

More information about Iowa State’s A.I. graduate program is available online at <https://www.cs.iastate.edu/ai>.

# FINDING SUCCESS

## *in computing*

Aubrey Sijo-Gonzalez is a force to be reckoned with. As an honors student majoring in computer science, Chair of the Student Advisory Council, and the recipient of several scholarships, Sijo-Gonzalez is as special as they come.

Sijo-Gonzalez is a senior undergraduate student in computer science. Prior to her time at Iowa State, Sijo-Gonzalez went to high school in West Des Moines. Her roots, however, are in General Santos, Philippines, where she lived until 2011. Sijo-Gonzalez attributes much of her inspiration to her upbringing.

### STRONG FOUNDATIONS

"I had a very happy childhood," Sijo-Gonzalez said. "Those moments are some of my happiest. I've always said that if I could grant a wish to every child, it would be to have a childhood like mine. I was raised by my mom and my grandparents, which is a common family dynamic in the Philippines. No matter the situation, my family was there for me and I always felt very supported."

While in high school, Sijo-Gonzalez was first taught about computer science. Although she didn't immediately realize that computer science was the right fit for her, she called her decision more of a practical decision.

"I took a computer science class out of pure interest and it turned out I wasn't too shabby so I gave it a shot," Sijo-Gonzalez said. "I stayed in this field because at some point it became more personal. Computer science allowed me to do more things than I ever thought I could do. I was discovering parts of myself that I wouldn't have discovered otherwise."



### CHOOSING AN ADVENTURE

During the college selection process, Sijo-Gonzalez looked into other universities with good programs but ultimately chose Iowa State University after an on-campus tour. The things that appealed to her were the math and science assistance programs as well as the plethora of scholarships available.

"The emphasis on scholarships really showed me that Iowa State was willing to invest in my education," Sijo-Gonzalez said. "The financial assistance alleviated the burden for me and my family, so it was very valuable to me."

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WILLING TO INVEST IN MY EDUCATION.**

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## FINDING HER STRIDE

While at ISU, Sijo-Gonzalez has been an active member of the student body. She spent a semester volunteering for the Queer, Trans, People of Color Organization, helping with community outreach events and networking events. She also became a member of the Department of Computer Science's Student Advisory Council in her sophomore year, eventually becoming the Council Chair.

"It's been quite exciting being the Chair of the committee, I'm really eager to impact the department," Sijo-Gonzalez said. "I'm thankful for a strong council that can count on one another."

## MAKING MOVES

Not only has Sijo-Gonzalez been successful academically and in her extracurriculars, but she has also gained a wealth of professional experience that she will take with her to the workforce. In the spring semester of her freshman year, Sijo-Gonzalez was matched with a research mentor. She worked for a start-up company through the ISU Research Park where she worked to help develop software that would help organic certification for Iowan farmers. After that, she started her first internship at a

private insurance company as a web developer intern. Most recently, Sijo-Gonzalez worked for Nationwide as an app developer intern.

During her internship over the summer, Sijo-Gonzalez was offered a full-time post-graduation position with Nationwide which she accepted. Sijo-Gonzalez said she is thankful for the foundation her education at Iowa State gave her.

"The computer science courses at Iowa State were rigorous enough that they gave me a strong foundation that I've been able to apply professionally," Sijo-Gonzalez said.

Her advice to incoming computer science students? Pace yourself.

"Try to find what best suits you and try not to be too concerned with one perspective," Sijo-Gonzalez said. "Be open to new things and find what works for you."

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**BE OPEN TO NEW THINGS AND FIND  
WHAT WORKS FOR YOU.**

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# ATANASOFF *history*

**1930**

John Atanasoff came to Iowa State as an Assistant Professor of Mathematics and Physics.

**1939**

Atanasoff, with his Ph.D. student Clifford Berry, built the first electronic digital computer, the ABC.

**1940**

Atanasoff leaves ISU to work with the Naval Ordnance Laboratory in Washington D.C.

**1945**

Ph.D. student and future founding Chair of the Computer Science Department, Robert Stewart, dismantled the ABC in the basement of the Physics Building to make room for new research projects.

**1956**

The Cyclone Computer was built and was intended to be a more general purpose computing machine. It was 10 feet tall, 12 feet long, 3 feet wide, and contained over 2,700 vacuum tubes.

**1969**

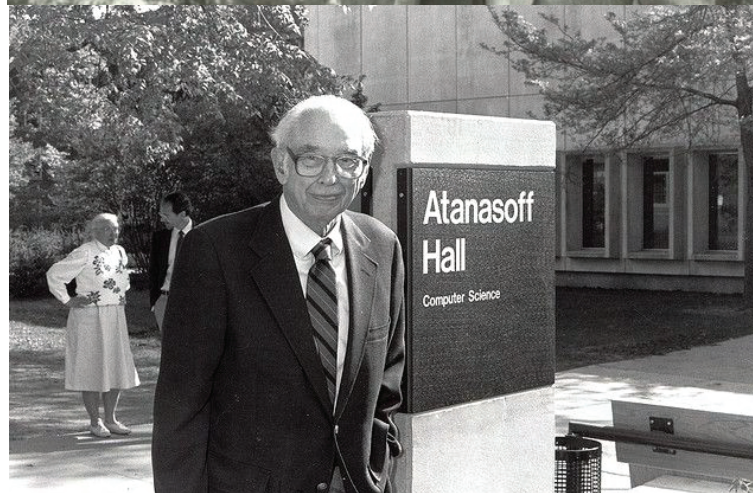
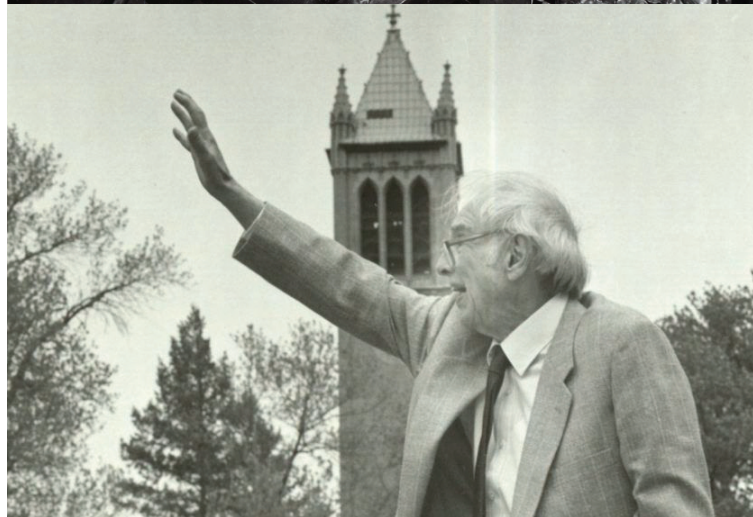
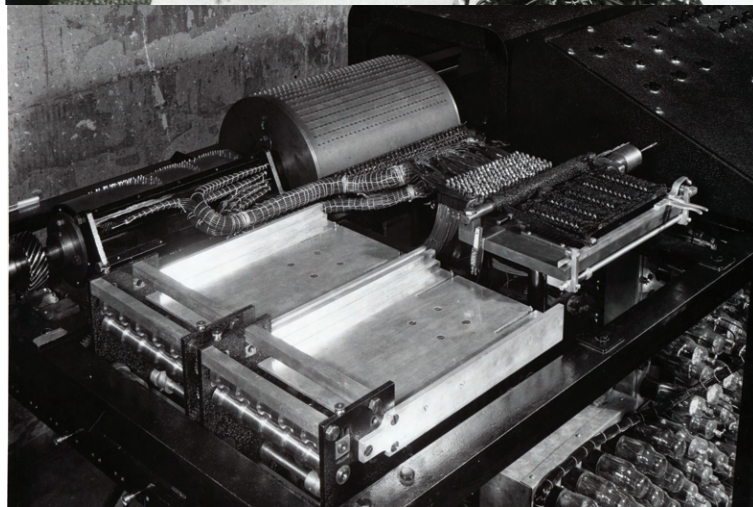
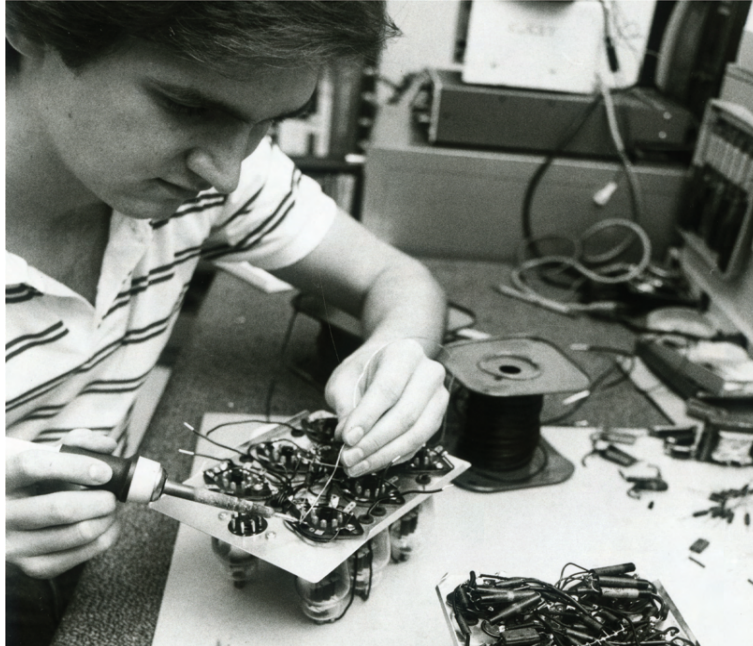
ISU establishes undergraduate major in Computer Science. The first class included 75 students enrolled in 17 courses.

**1969**

The computer science building is built and later named Atanasoff Hall.

**1972**

After a lengthy legal battle, Atanasoff gets credited with inventing the first electronic digital computer.



# BY THE NUMBERS

## FACULTY ACHIEVEMENTS

- 31** Tenured and tenure-track faculty
- 9** NSF CAREER Award winners
- 3** ACM Distinguished Members
- 2** AAAS Fellows
- 1** NSF PECASE Award
- 1** AFOSR Young Investigator Award
- 1** Fulbright Scholar
- 1** IEEE Fellow and EURSC Fellow

## RANKINGS:

- #11** in Software Engineering
- #23** in Embedded and Real Time Systems
- #35** in Robotics
- #59** in Artificial Intelligence

**\$6.6 MILLION** of external funding since 2018

**95%** of undergraduates are employed within six months of graduation

**\$72,600** average salary of computer science graduate

**#1** ranked computer science school in Iowa

**4,000** students in Computer Science courses per semester

**60+** computer science classes offered

## RESEARCH EXPERTISE:

- Artificial intelligence and machine-learning
- Bioinformatics
- Data science
- Robotics
- Software engineering, programming languages
- Systems and networking
- Theoretical computer science

## MULTI-DISCIPLINARY RESEARCH:

- Computational biology
- Human-computer interaction
- Information security

**722**

Undergraduate  
Students

**151**

Graduate  
Students

**266**

Out-of-state  
Students

**278**

International  
Students

**95**

Female  
Undergraduates

**56**

Female  
Graduates



# FAREWELL *to faculty*



**JOHNNY WONG**, professor emeritus of computer science, recently retired after a lengthy career of innovative research, mentorship, teaching and service.

During his time at Iowa State University, Wong rose to the rank of Associate Chair of the Department of Computer Science, Information Assurance and Human-Computer Interaction Programs. His research included software systems, networking, security and medical informatics. He is also the President/CEO of the startup company EndoMetric Corporation, with products for medical informatics.

He has served as an external grant reviewer for the National Science Foundation (NSF) and also reviewed journal and conference papers for various conferences. Wong's research in medical informatics earned him a U.S. Patent for Colonoscopy Video Processing for Quality Metrics Determination in 2011. We wish Johnny all the best in his well-deserved retirement.

In February, the department suffered a great loss with the passing of Professor Emeritus, **GIORA SLUTZKI**. Giora dedicated his life to the university and department during his long career at Iowa State University. We will deeply miss his contributions, wisdom, quick-wittedness, and genuine care for students and colleagues alike.

He joined the department in 1983 where he spent the next 37 years. He ascended to the rank of professor where he was a dedicated researcher and instructor.

Over the years, he taught courses covering various topics of the theory of games, knowledge, and uncertainty, discrete computational structures, the logic for mathematics and computer science and computational theory.

His legacy leaves an irreplaceable impact on our department and we are dedicated to honoring his memory through our work in the future.







# RESEARCH *excellence*

Research in the Department of Computer Science spans the fundamentals of computation through machine-learning, robotics and other applied technologies. Our faculty, graduate students and even some undergraduate students are expanding the science of computing among interdisciplinary teams at Iowa State, and are collaborating with computer science leaders around the globe.

Some of the grants secured in the past year include:

## ENHANCING INFRASTRUCTURE FOR STUDYING SOFTWARE AND ITS EVOLUTION AT A LARGE SCALE

**Faculty:** Hridesh Rajan

**Funding Amount:** \$824,474

**Funder:** National Science Foundation

## ALGORITHMS, SYSTEMS AND THEORIES FOR EXPLOITING DATA DEPENDENCIES IN CROWDSOURCING

**Faculty:** Qi Li

**Funding Amount:** \$249,998

**Funder:** National Science Foundation

## WEAK DERANDOMIZATIONS IN TIME AND SPACE COMPLEXITY

**Faculty:** Pavankumar Aduri

**Funding Amount:** \$228,000

**Funder:** National Science Foundation

## GRAPH NEURAL NETWORKS: A FEATURE AND STRUCTURE LEARNING APPROACH

**Faculty:** Hongyang Gao

**Funding Amount:** \$175,000

**Funder:** National Science Foundation

## RAPID ADJUDICATION OF STATIC ANALYSIS ALERTS DURING CONTINUOUS INTEGRATION

**Faculty:** Wei Le

**Funding Amount:** \$157,700

**Funder:** Carnegie Mellon University

## SAFE DEPLOYMENT OF SMALL UNMANNED AERIAL SYSTEMS THROUGH ON-BOARD MONITORING AND ASSESSMENT

**Faculty:** Myra Cohen

**Funding Amount:** \$67,663

**Funder:** University of Notre Dame



# FACULTY *accolades*

**SIMANTA MITRA** was named as the co-director of the North Central North America region of the International Collegiate Programming Contest (ICPC). In this new role, he will help guide the direction of the ICPC, putting his years of experience with the organization to work.

**ROBYN LUTZ** won a Lifetime Service Award at the International Requirements Engineering Conference. Robyn has a long history with the RE Conference and was presented the award to thank her for her many contributions and distinguished service to the RE community.

**HONGYANG GAO** received a National Science Foundation (NSF) grant in the amount of \$175,000 for his work with graph neural networks. Gao said the award will give him the necessary resources to conduct his research.

**WEI LE** was awarded a grant for rapid adjudication of static analysis alert from Carnegie Mellon University. The project aims to develop algorithms and tools for matching static warnings and vulnerabilities across software version to support rapid CI assurance.

**HRIDESH RAJAN** served as the General Chair for the ACM SIGPLAN conference on Systems, Programming, Languages, and Applications: Software for Humanity. Rajan was also selected as a Fellow of the American Association for the Advancement of Science.

**ADISAK SUKUL** was selected as a Google Cloud Faculty Expert for the second year in row. The title rewards Google Cloud's top faculty advocates with professional development, recognition, networking opportunities, and access to Google developers for helping other educators explore cloud computing.

**JIN TIAN** joined the Simons Institute Program at the University of California, Berkeley. The program aims to integrate advances and techniques from theoretical computer science methods for casual inference and discovery.

**DAVID FERNANDEZ-BACA** received the LAS Dale D. Grosvenor Chair award. David's research career spans thirty years and his work has been published in dozens of peer-reviewed journals.

**Qi Li** received a National Science Foundation (NSF) grant for developing algorithms, systems and theories for exploiting data dependencies in crowdsourcing. The team of researchers discover and exploit the dependencies in the data, via novel methodologies, to significantly reduce the cost and noises when providing critical knowledge for machine learning.



# TRAILBLAZING *alumna*

Kathy Hahn Davidson was a member of the first graduating class of computer science at Iowa State, which makes her not only a distinguished alumna, but a historic one. In October, Kathy was presented with the Distinguished Alumni Award from Iowa State's Department of Computer Science.

## HISTORY MAKING

Davidson graduated with a bachelor's degree in computer science from Iowa State in 1973. She joined Hewlett Packard (HP) as a research and development (R&D) software engineer while simultaneously pursuing a graduate degree in computer engineering from Stanford University. In her nearly 30 years with HP, Davidson held many R&D and management positions, until she was tasked with shepherding in the new millennium as HP's worldwide director of HP/Agilent Technology's Year 2000 Product Program. In this role, she spearheaded HP's Y2K product efforts and launched the Y2K Program Office to meet product compliance objectives across 187 product lines.

Davidson was instrumental in developing many innovative products and programs during her time at HP. She was the driving force behind the design, development and maintenance of operating systems and networking products for HP 1000, 3000 and 9000 systems/servers. She created and managed the HP9000 Customer Advocacy Program and Technology Advisory Board to help improve customer relationships with R&D teams and to drive requirements for new systems.

Her work at HP paved the way for products and software that we use today which allowed for advancements in every aspect of our lives. After leaving HP in 2000, Davidson joined

Network Appliance (now NetApp) as the Senior Director of Operating Systems Engineering before consulting for startups like Test Lab Technologies and Sagere Group. Davidson retired in 2003.

## GIVING BACK

Davidson has recruited many Iowa State graduates to HP and helped drive HP computing equipment donations to the University. She is a lifetime member of the ISU Alumni Association and is funding an Iowa State University Foundation scholarship for female computer science majors.

"My career success was built on the solid foundation from ISU and the academic challenges that prepared me for the opportunities in the high-tech industry," said Davidson.

Since Kathy was a student at Iowa State, she has been a vocal advocate for underrepresented students, including women in computer science. The Kathy Hahn Davidson scholarship will help countless women in computer science for years to come.



**“ MY CAREER  
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INDUSTRY. ”**



# USING A.I. TO IMPROVE *medical practices*



Wallapak Tavanapong, professor in the Department of Computer Science, developed software that uses artificial intelligence (A.I.) to provide doctors with real-time feedback during colonoscopies. The technology aids the improvement and thoroughness of the colon examination, which could boost polyp-detection rates and lead to better patient outcomes.

"It's incredible to be a part of research that makes an impact and can be translated into something that helps a lot of people," said Tavanapong.

The A.I. software is currently in phase-one clinical trials with the National Institutes of Health (NIH) and provides physicians with a powerful tool in the fight against colorectal cancer. According to the Centers for Disease Control and Prevention, colorectal cancer is the third-leading cause of cancer-related deaths in the United States.

## IMPROVING THE COLONOSCOPY

Using machine-learning algorithms, the software indicates when a colonoscopy is

performed too quickly or if the colon mucosa contains fecal matter that may conceal polyps or cancerous growths. The software also promotes better inspection techniques by encouraging doctors to examine all areas inside the colon.

"When the doctor moves the camera slower or looks around more, they will do a better job of detecting hard-to-spot polyps which could be cancerous," Tavanapong said. "This technology was designed to help doctors perform colonoscopies with the utmost effectiveness in ways that reveal clearer views of the colon as well as areas of concern."

As part of the NIH trials, the software is being used and tested by doctors at Johns Hopkins University, the University of Washington, Seattle and the University of Minnesota, Twin Cities.

## HOW IT WORKS

During a colonoscopy, a thin, flexible endoscope with a tiny camera at the tip is inserted into the rectum. While the camera advances through the colon—which is about 5 feet long—it generates images of the colon lining.

Tavanapong's software is virtually synched with the endoscope camera. The machine-learning

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algorithms analyze the images from the endoscope video processor. Critical insights about the images are revealed and provide on-the-fly feedback to the doctor throughout the procedure.

Several software modules translate colors, grayscale and image clarity into information, which prompts the doctor to slow the procedure or clean remaining stool. Numerical feedback appears on the side of the screen, signaling to the doctor when actions could be improved.

"Imagine you're backing out of a tunnel, which is exactly what the doctor does during a colonoscopy," Tavanapong said. "Pointing the camera in different directions, inspecting all sides and looking increases the score and confirms to the doctor that they are doing a good job."

In effect, the software is like a built-in second opinion and scorekeeper, providing instant recommendations and objective feedback to the doctor.

### DEVELOPING SOMETHING NEW

In 2003, Tavanapong began researching the possibility of using artificial intelligence to improve colonoscopies. While discussing these ideas with a gastroenterologist at the Mayo Clinic, she learned that no such software existed.

Discovering this unmet need created a light-bulb moment for Tavanapong.

"This was an exciting opportunity. I was very happy to know that I could develop software that doctors were really wanting, but no one had created yet," she said. "I've always been interested in making data useful and we've worked very hard on this for many years."

This promising research has earned Tavanapong

funding and support from the NIH and the National Science Foundation (NSF).

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**IT'S VERY REWARDING TO KNOW THAT  
YOUR IDEAS AND RESEARCH COULD BE  
USED TO MAKE A DIFFERENCE.**

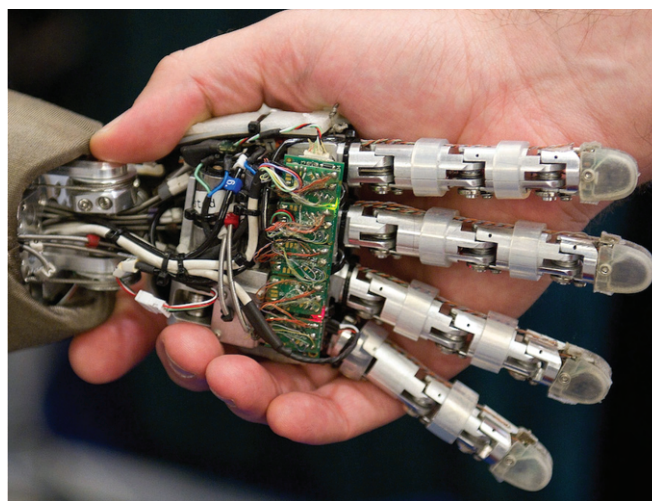
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### PROMISING FUTURE

The NIH phase-one clinical trials, which began in 2017, will wrap up in early 2022.

"So far, the feedback from participating doctors has been encouraging and hopefully the process will continue to move forward," she said. "It's very rewarding to know that your ideas and research could be used to make a difference."

Tavanapong, who joined Iowa State University in 1999, holds a U.S. patent on colonoscopy video processing for quality metrics determination. She is co-founder and Chief Technology Officer of EndoMetric, a software company that offers computer-aided technology for colonoscopies. She's won several awards for her clinical and computer science research.



# NEXT GENERATION OF *computer scientists*

The Department of Computer Science hosted a two-week-long computer science workshop over the summer. The workshop was a hands-on learning experience for high school students in the Science Bound program who were interested in Computer Science.

## **BROADENING PARTICIPATION**

The workshop improved outreach efforts to the K-12 community, with special emphasis on broadening participation in computer science among underrepresented students. The instructors were real-world CS professors, which gives students a better idea of the world-class faculty at ISU. Overall, the workshop helped the Department of Computer Science set its program apart from other schools at an early stage in the students' career explorations.

## **SCIENCE BOUND**

The students involved in the workshop were part of the Science Bound program which

is Iowa State University's premier pre-college through-college program that empowers Iowa students of color to pursue degrees and careers in ASTEM (agriculture, science, technology, engineering and mathematics) fields and education.

They engage middle and high school students from Osceola, Des Moines, Denison, and Marshalltown, Iowa. Students begin the nine-year program during the summer before eighth grade and continue through to college graduation.

The workshop was facilitated by professors Wallapak Tavanapong, Soma Chaudhuri, Ying Cai and Christopher Quinn, along with student volunteers and with the help of Science Bound.

## **OUTCOMES**

Students left the workshop with intelligent computer systems that they built and with a deepened understanding of the possibilities a computer science degree can have.





# UNDERGRADUATE PROGRAM

## *ranked among the best*

Several national publications have ranked or recognized Iowa State University for its academic programs, value, commitment to public good and entrepreneurial spirit. Among these accolades is the 60th place (tied) for the U.S. News and World Report's ranking of undergraduate computer science programs.

According to the U.S. News and World Report, Iowa State's computer science program achieved a spot in its rankings after top academics and officials from computer science programs rated the overall quality of undergraduate programs with which they were familiar, on a 1-5 scale. A school's undergraduate computer science rank is solely determined by the average of scores received from these surveys.

### **STRONG FOUNDATIONS**

"It's an exciting time for the Department of Computer Science, as we build on strong foundations with our alumni, donors and world-class faculty who have allowed us to succeed," said Hridayesh Rajan, Kingland Professor of Data Analytics and computer science department chair. "We're honored to be ranked by U.S. News and we will continue to provide undergraduate students with cutting-edge educational and research opportunities, as well as access to faculty who are recognized leaders in their fields."

“

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WITH OUR ALUMNI, DONORS AND  
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”



In the 2022 U.S. News and World Report rankings, Iowa State tied for 58th among top public schools and tied for 122nd in the overall national rankings.

Methodology for the national rankings is based on student outcomes (graduation, retention rates), faculty resources (faculty salary, class size), academic reputation (judged by academics at peer institutions), financial resources (average spending per student), student excellence (SAT, ACT scores) and alumni giving.

### **ADDITIONAL RANKINGS**

In August, Washington Monthly released its 2021 National University Rankings, which measure university contributions to the public good in three categories (social mobility, research and promoting public service). Iowa State was the only public university in the state ranked in the top 30 for the overall rankings at 27th. The university was also listed in the following categories: Best Bang for the Buck and Best Colleges for Student Voting. Iowa State is ranked 11th among the top 50 undergraduate programs for entrepreneurship, and is the only Iowa university listed as a top 20 Best Schools for Financial Aid (Public Schools) at 15th.

# IOWA STATE UNIVERSITY

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