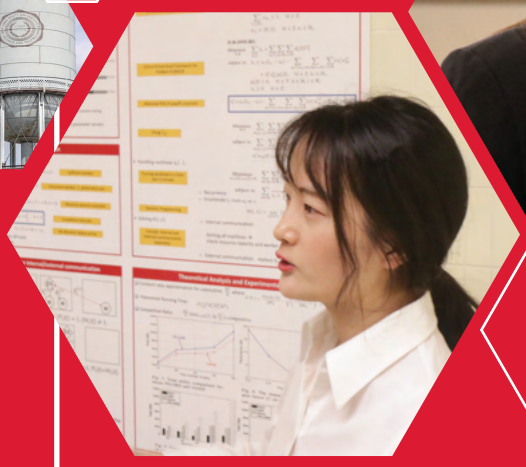
IOWA STATE UNIVERSITY

Department of Computer Science



STRATEGIC PLAN 2022-2032

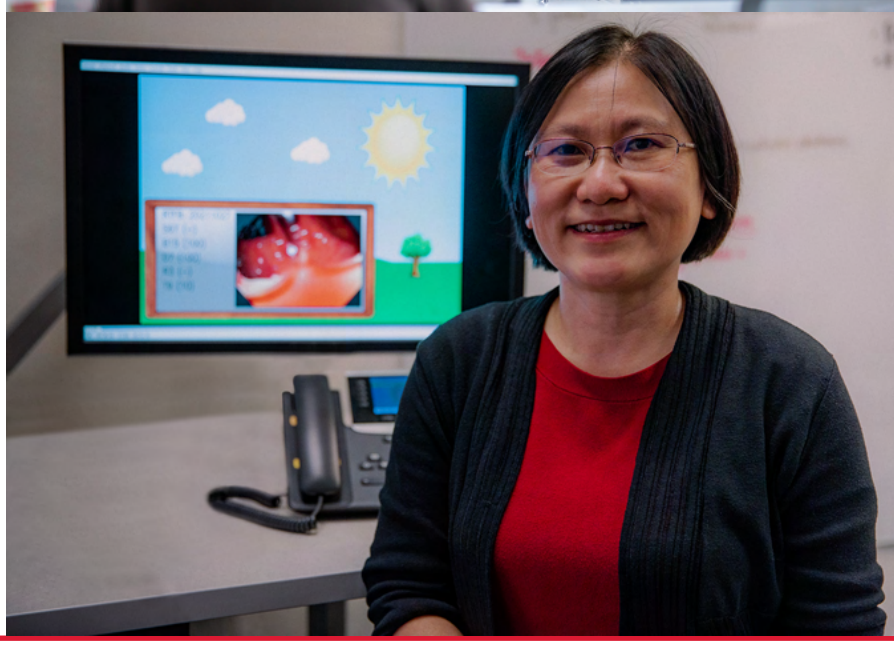
MISSION

Our mission is to excel and to be leaders for creating, sharing, and applying computing knowledge in the state of Iowa, and to be nationally and internationally recognized as having student-centric, innovative computer science education, research, service, and outreach. We aim to be the leaders in building computational and dependable intelligent approaches that address emergent needs of society at large.

VISION

Iowa State has been leading computing since Atanasoff's invention of the first electronic computer in 1937.

We aim to continue this leadership by being internationally and nationally recognized for our expertise in areas of computing such as Software Engineering, Artificial Intelligence, Data Science, Theoretical Foundations, and Computer and Networking Systems, and in areas of national priority such as cybersecurity, quantum computing, robotics, and autonomous systems. We will continue to embrace Iowa State's land grant mission as campus and state leaders, to be trusted partners in cross-disciplinary computing research, forging frontiers in innovation and entrepreneurship. We will inspire and prepare students for lifelong learning and will educate and train a diverse undergraduate and graduate body of students who will have successful careers and thrive in a wide range of rapidly evolving computing disciplines and industries.



"TO BE"

To be **leaders** for creating, sharing, and applying computing knowledge across Iowa and beyond;

To be **trusted partners** in building science and technology that solve grand societal challenges;

To be **nationally and internationally recognized** as having student-centric and innovative computer science education, research, and service;

To be a **diverse, equitable, and inclusive department** where students, faculty, and staff flourish;

To be **proactive in engagement** with educational partners, local industry, and governmental entities.

GOALS

Undergraduate Education

Our undergraduate programs are designed to train computer scientists, data scientists, and software engineers for productive, life-long careers. The Department offers strong undergraduate programs leading to a B.S. in Computer Science, a B.S. in Software Engineering, and a B.S. in Data Science.

Overall Goal

Continue to offer a high impact ISU experience that produces a globally competitive and diverse body of skilled graduates. These will become the most sought-after recruits for employment or higher education and will strengthen Iowa's technical workforce and excel in diverse work environments.

Objectives (O)

O1: Train students to embrace computational thinking and to master theoretical concepts and practical skills of computing which are fundamental to their future career.

O2: Provide a foundation from which students can pursue lifelong learning with confidence.

O3: Enable students to work collaboratively in a diverse and global environment.

O4: Expose and involve students in the creation of new knowledge and cutting-edge research.

Plan

Increase our recruitment of a diverse body of students and faculty and maintain an inclusive learning environment. (O3)

Reward teaching and undergraduate research using experiential learning, informed by cutting edge research. (O1, O2, O4)

Offer multiple paths to a computer science degree by offering a variety of advanced undergraduate courses related to our areas of expertise. (O1-O4)

Hire and retain internationally renowned faculty in current and targeted areas of research excellence. (O1-04)

Increase small mentoring groups and faculty supervised undergraduate research. (O1, O4)

Graduate Education

Our graduate programs offer a graduate curriculum and research-based training leading to M.S. and Ph.D. degrees in Computer Science and an M.S. in Artificial Intelligence. The department also plays a pivotal role in interdepartmental graduate majors and minors such as Bioinformatics and Computational Biology, Cybersecurity, and Human-Computer Interaction.

Overall Goal:

To achieve recognition as an international and national exemplar for training graduate students with vision and skills to become scientific leaders who perform innovative research and are influential problem solvers, communicators and educators.

Objectives (O)

O1: Train students to perform independent scholarly research, and demonstrate this through publishing in top venues.

O2: Mentor students to give quality presentations on technical topics.

O3: Enable our graduate students to attain influential positions.

O4: Provide opportunities for students to learn foundations of grant writing and entrepreneurship.

Plan

Educate students to recognize and perform high quality research that is appropriate for top venues. (O1 - O4)

Provide incentives for students to publish and present in top venues. (O1, O2, O4)

Train students to write external grant applications and engage in startup opportunities. (O2, O4)

Support students in applying to and participating in internships. (O1 - O4)

Research and Discovery

We are continually expanding our internationally recognized research programs in Computer Science and its interactions with other fields; contributing to fundamental advances in Computer Science needed to address grand challenges in environment, agriculture, health, energy, safety and security, social implications of autonomous algorithms and computing technology; and to increase the economic competitiveness of Iowa and the nation.

Overall Goal:

To engage in world-class research and to lead in key areas of computing such as Software Engineering, Artificial Intelligence, Data Science, Theoretical Foundations, and Computer and Networking Systems, and in areas of national priority such as cybersecurity, quantum computing, robotics, and autonomous systems.

Objectives

O1: Improve our departmental rank overall and in key areas of expertise.

O2: Expand the size and quality of graduate programs.

O3: Increase our impact on industrial computing.

O4: Successfully engage in cross-disciplinary research and technology transfer.

Plan

Actively recruit and retain exceptional faculty, graduate students, and support staff. (O1-O4)

Obtain funding (both foundational and cross-disciplinary) from a variety of external sources. (O1- O4)

Support faculty and students to present their research at prestigious international venues. (O1, O3)

Build a world class research technology infrastructure. (O1-O4)

Increase our expertise and create clusters in key research areas. (O1, O3)

Create mechanisms to facilitate and incentivize transdisciplinary research. (O4)

Service, Outreach and Engagement (S)

Our department contributes to the community and society at large including from technology transfer, faculty startups, open-source software, partnering with Iowa K-12 teachers and students, partnering with other departments at ISU, broadening participation of underrepresented groups in Science, Technology, Engineering, and Mathematics (STEM) disciplines, and advising industry, government, and non-profits.

Overall Goal:

To reach a diverse community beyond computer science, to increase their understanding of and interest in computing, to broaden the participation of underrepresented groups, and to provide an inclusive, synergistic environment.

Objectives (O):

O1: Encourage and train more K-12 students and teachers to engage in computer science.

O2: Increase our impact on local industry.

O3: Participate in setting directions in local, state, and national policies related to computing.

Plan:

Expand outreach programs to promote computational thinking and introductory concepts in computing to traditionally underrepresented groups. (O1)

Serve on national relevant panels and key computer science committees. (O3)

Engage local K12 schools where our expertise can help increase computing literacy. (O1)

Interact with industry via internships, senior design projects, and startups. (O2)