

# COLLEGE OF COMPUTING

## Strategic Plan 2022





# WELCOME

We present the inaugural strategic plan for Illinois Tech's College of Computing. The college was founded on June 1, 2020, to play a leading role in education and research for the tech community in Chicago and to infuse computing across all of Illinois Tech's disciplines and to provide students from all backgrounds meaningful roles in a changing technological society. This plan describes the vision and goals to ensure we meet these pillars and move Illinois Tech and the College of Computing forward.

We plan to focus on data science, cybersecurity, and the digital transformation of just about everything, from manufacturing to health care to money and space. While we present this as a complete plan, it can never be a fully finished project. Computing changes quickly, and new partnership opportunities may arise. We must remain agile, staying ahead of technological change so we can help shape the future instead of being shaped by it.

This document collects the input of our major stakeholders—the faculty, staff, and students of the College of Computing and our advisory board that consists of alumni and local business leaders. I particularly would like to thank Board of Advisors Chair Chris Gladwin and Vice Chair Joel Krauss, Associate Dean Xiaofan Li, and department chairs Shlomo Argamon, Bob Carlson, Pam Houser, Chun Liu, Calvin Nobles, and Mazin Safar. I also value the support and input from Illinois Tech President Raj Echambadi and Provost Peter Kilpatrick. This plan complements and builds upon the [university-wide strategic plan](#).

We held a strategic planning retreat to kick off the process in August 2020 with representatives from all of our stakeholders. We discussed the plan at several Board of Advisors meetings and at a faculty/staff retreat in October 2021. We had five strategic planning working groups led by Board of Advisors members and including representatives from the board, faculty, staff, and students.

- Academic Programs (led by Michael McCourt)
- Student Experience and Diversity (Joel Krauss)
- Strengthening Research (Frederica Darema)
- Corporate Partnerships (Rénu Kulkarni)
- Alumni Relations, Programming, and Events (Biju Nair)

This plan only captures a tiny fraction of the ideas generated by the reports of the working groups, the discussions at the various retreats and meetings, and direct conversations with stakeholders, but we will pull from all of our materials to guide the future of the college.

I hope this plan inspires you to work with us, join us, partner with us, support us, or just root for us. We have an aggressive but realistic plan. We look forward to implementing our plan, but it can only happen with the support and hard work of all our stakeholders.



A handwritten signature in black ink, appearing to read 'Lance Fortnow'.

**Lance Fortnow**  
Founding Dean, College of Computing  
Illinois Institute of Technology

April 2022

# STRATEGIC PLAN

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## CORE VALUES

### Vision

Become the leading creator of computational talent, knowledge, and innovation for Chicago and beyond.

### Mission

Provide students and faculty of all backgrounds and disciplines at Illinois Tech with the best-in-class computational and data science platform to excel in academics and research in their respective fields.

### Pillars

The College of Computing was founded on three pillars:

1. Play a leading role in growing the tech community both locally and globally through education and research
2. Computing as a horizontal: Infuse computing education, research, tools, and ideas into nearly every discipline, course, and activity across campus
3. To paraphrase minister Frank Wakeley Gunsaulus's founding mission for the university: Provide every student, from all backgrounds, meaningful roles in a changing technological society



## STRATEGIC TARGET AREAS

We are in the midst of a true digital transformation. A new era has developed over the past decade where we can collect more data and create value from it through machine learning and other techniques. We are seeing a fundamental shift in computing to creating code from logic and creating programs and trained models through examples and data. This change is affecting not only how Illinois Tech shapes the College of Computing, but how it affects the entire university. We have an opportunity to get ahead of the technology and provide students in the college and across the university the tools, techniques, and training to take full advantage of this new paradigm in their future careers.

The college should aggressively move to expand and organize our efforts in the primary areas of data science and cybersecurity—both in the research and academic offerings and internally within the college and across the university and beyond. For the areas where the digital transformation is affecting other disciplines, we will develop the resources needed for future research and academic programs. These areas will continue to evolve as we see how computing advances and interacts with other disciplines and society in general.

## Data Science

Data Science is a quickly developing field that takes information to knowledge and then to action. Data science goes far beyond machine learning, covering the whole data science life cycle: data collection, data cleaning, modeling, analytics/learning, visualization, and responsible decision making. Data science sits at the heart of the digital transformation.

## Cybersecurity

As data becomes more valuable, the need to safeguard information becomes paramount. Ransomware, industrial espionage, and foreign government-led attacks have become commonplace in recent years, requiring every organization to take strong steps to protect themselves and react to these threats. Based on discussions with several corporate leaders, the greatest hiring need is a strong cybersecurity workforce. Focusing on and expanding the university's existing strengths in this area, we will develop a state-of-the-art cybersecurity range to help train students on both offensive and defensive cybersecurity.

## Digital Transformation

The digital transformation cuts into all disciplines. Below are examples for a few opportunities that we are exploring, often with partnerships inside and outside of Illinois Tech. The college plans to explore these areas for collaboration and to establish research programs and perhaps academic programs as warranted. The college will continue to aggressively seek out new degrees and partnerships as opportunities arise.

## FinTech

The digital transformation of money powers new financial technology fields including electronic payments, blockchain, and crypto and digital currencies. With the city of Chicago's strength in finance, Illinois Tech can be a provider of talent and technologies for this growing area locally and globally. The applied math department has several faculty in this area and will transition its mathematical finance program toward a fintech degree at the graduate and undergraduate levels.

## Digital Manufacturing and Supply Chain

New geopolitics and the need for resilience laid bare by the pandemic require a new focus on ensuring a strong manufacturing base in the United States, as well as a supply chain that can quickly adapt to changing conditions. Technologies such as automation, blockchain, and distributed databases and digital twinning are transforming these industries and are critical to their future. The college will work with Armour College of Engineering, the food science and nutrition program, Chicago digital manufacturing center MxD, and corporate partners to ensure we can produce the talent needed to drive the future of manufacturing and supply chain that has traditional roots in Chicago and the Midwest.

## Health Care Informatics

Paradoxically, because Illinois Tech does not have a medical school unlike most of the major research universities in Chicago, we have the opportunity to work with independent medical schools such as Rush and Rosalind-Franklin. These medical centers would like to partner with a technical university to apply data analytics and machine learning to their health care data. The college will take full advantage of these opportunities to improve health care delivery, treatment, and doctor-patient relations, and help scale so that a broader range of the population can enjoy high-quality medical care.

## Immersive Technology

The electronic gaming industry has mushroomed as new technologies will lead to hyper-realistic gaming experiences, and major tech companies are investing heavily in the "metaverse," a shared virtual reality experience. Partnering with Surge, a new private esports and virtual reality center near campus, Columbia College Chicago, and the game-design faculty in the Lewis College of Science and Letters, Illinois Tech can lead in training for these new worlds. Engineering, architecture, and design will all play an important role as virtual and augmented reality become a growing area. We can also use these virtual spaces as a way to do active learning online with a sense of presence.

## COMPUTING AS A HORIZONTAL

Over the past 15 years computing has evolved with tremendous advances in areas such as cloud, mobile, data science, machine learning, social media, and ecommerce, all of which have influenced every aspect of our society and touched every discipline. Future advances will only make computing and data even a larger part of our lives. We must make sure that students across campus, not just those in computing, get the computational skills they need to succeed in their careers and have productive and safe lifestyles.

Our students need to develop the skills not only on how to tackle problems using the computational and data science tools and techniques, but also to understand the ethical, privacy, security, and social implications of using these tools. Ultimately, every student should know how to translate data into responsible decision making.

The College of Computing will take a four-prong approach to bring computational and data skills to our undergraduate students, in order of ease of implementation. The ultimate goal is for a total infusion of computing into every course and discipline across Illinois Tech to ensure that our students, no matter what discipline they pursue, are prepared to tackle society's largest (and smallest) challenges using the best tools available.

### Core Curriculum

Currently all Illinois Tech undergraduate students are required to take at least one course in computing. The college needs to continually rethink these courses to ensure that they cover the current tools and concepts of computing, such as data science, security, and ethical concerns. The college will work with the university to allow more flexibility, introducing a more modular approach to learning these materials and integrate them better with students' majors. Ultimately, the college will design a core that works within the full infused computing framework.

### CS+X

A CS+X program is an interdisciplinary degree that builds on the strength of both computing and another discipline. It takes two programs, one from computing, such as computer science, data science, cybersecurity, or artificial intelligence, and one from another discipline, possibly closely related like computer engineering, to something quite different, such as philosophy. A CS+Business program can provide students with the leadership skills to advance in small or large technology-focused companies. A CS+History program can allow a student to follow a passion area like history while developing the skills that will ensure a productive career. The CS+X program can bring computing students who may not have chosen it as a profession into other fields, potentially helping to increase the diversity of that field.

CS+X programs can take many forms—including as a double major or through a dual-degree program—that fulfills the full requirements of both degrees, or as a combined degree program that has reduced requirements for both majors with a small number of courses that cross the disciplines.

CS+X programs have their limitations. For example, a CS+Business program cannot bring advanced computing skills into the business courses, since those courses are also being taken by students solely enrolled in the business degree. Students may not gain the skills needed to truly apply strong data and computing skills to the business world. To accomplish that task, the college must consider different approaches described below.

### Combined Fields

Instead of just combining computing courses with courses from another discipline, we can work at the edges of two fields to create a wholly new discipline. Bioinformatics is the classic example, and more recently we've seen areas develop like digital humanities, Internet of Things, and quantum computing. They have their own conferences and journals, courses, and degrees.

In combined fields, researchers from both disciplines take the time to learn the important concepts, tools, and questions from the other discipline. When it is done well, this is “computing as a horizontal” at its best, as researchers and students truly learn how to apply computing to solve problems in other disciplines and often vice versa.



Combined degrees require overcoming the challenges of bridging the different academic cultures between fields. Combined fields also don't scale well, as each new combination requires rethinking a whole research and educational space.

The College of Computing will undertake the exploration of combined fields where the college has the right combination of expertise. The college is currently developing programs in financial technologies (fintech) and game design, and will consider a number of other programs based on Illinois Tech's capabilities and employer and student demand.

## Infused Computing

To truly ensure that every student not only learns about computational tools, techniques, and thinking, but also learns how to apply them to their chosen field, Illinois Tech students will need to think computationally in every course they take. Depending on the course and field, some may use computation at a more technical level than others, but students should always be aware of the tools they can use to attack the challenges in their studies.

The college will work with the rest of the university and the Office of Technology Services to choose a common set of tools, perhaps a cloud service that has built-in modules for learning from roll-your-own to pre-trained models, as well as a number of other computing-related services and with a commonly used programming language such as Python. The college will offer modules at different technical levels, as well as modules on ethics, security, privacy, and policy to teach both the students and the faculty across campus.

With the proper training and access, every course instructor can then ask how understanding data and computing can help them understand and solve their problems.

Once this infusion model is in place, other units can create modules to teach soft skills such as communication, design, entrepreneurship, leadership, design, and teamwork.



## INNOVATIVE EDUCATION

The traditional four years of college with semester-long, on-campus courses followed by graduation no longer suffices in our quickly changing technological society. We must ensure that we can prepare and keep ready a diverse student body in the college and across Illinois Tech.

### Agility

By their nature, academic degrees and courses tend to be static. In computing, especially in recent times, we have seen tremendous growth, change, and completely new paradigms in our field. The computing landscape for students when they graduate can look completely different from when they started.

The college must build in mechanisms for courses and degrees to change by default. We should never consider a course or a program “finished,” rather it’s just the latest version, not unlike how apps get constantly updated, sometimes mid-stream during the course itself. We cannot just create a program for today, no matter how up-to-date, and expect it to work tomorrow.

### Modules

Traditionally, courses are semester-long, three-to-four-credit offerings. In many cases, we need to teach specific skills or topics, say how to use a specific software application, which might not require a whole course sequence. In other cases, statistics for example, we have courses in nearly every department on campus with substantial overlap.

We will develop a modular approach—for example, one credit offerings over a third of a semester—that can be used for short offerings or mixed and matched to cover overlapping areas. For example, instead of biology needing to teach its own full statistics course, it could use three modules: basic knowledge of statistics, using a statistics package, and biological applications for statistics. The first two modules would be taught university-wide and biology would only have to staff the third.

### Distance Education

Illinois Tech led the way in distance education in its earliest forms half a century ago, and the university should use technology and training to regain that distinction. Likely, virtual reality will enable new modalities for distance learning, and we should start now to see how the sense of presence in the “metaverse” can make for a more effective active-learning experience.

Distance learning removes the advantage of location that we have in the Chicago area. The college should not simply replicate other programs, but either find our specific niches (say digital manufacturing) or develop exclusive partnerships teaching at various organizations including foreign universities, corporations, and government and nonprofit companies to give Illinois Tech a true global reach.

### Competencies

College has traditionally focused on degrees, but employers are beginning to focus on hiring students with specific skills. We need to think beyond the degree including certificates consisting of three to four courses in a specific area that can be stacked for a full graduate degree. We can offer micro versions of degrees that can provide quick, often virtual, instruction to give a student or employee specific skill sets needed for today’s job market.

## K-12

The pipeline of students into computing cannot start at the undergraduate level, and the college must realize its responsibility to reach students, particularly diverse students in the Chicago region, in high school and earlier. The college will grow its activities connecting to local schools and students, visiting the schools directly, expanding summer camp offerings, and campus events such as the STEM Expo. We will look into creating programs to train K-12 computing teachers.

These efforts should attract more diverse students not just into computing, but also to Illinois Tech.

## Community Colleges and HBCUs

We will broaden our reach through community colleges mainly in the Chicago region. Through direct visits to the colleges and new articulation agreements, we can have a healthy transfer program from community colleges into Illinois Tech. Collaboration with City Colleges of Chicago will build a strong pipeline of diverse students into the college. We'll develop programs to ensure that they are ready for our curriculum.

We will also build relationships with historically black colleges and universities and create a bridge program to allow them to take our master's programs after graduation.

## Career Readiness

As we infuse students across campus with computing and data skills, we will look to infuse our own students with the tools that they will need to succeed including leadership, design, communication, and entrepreneurship skills.

We will work with corporations to provide research projects and develop internship and co-op programs that will give our students the experiences to be ready to start their careers on day one.

## Corporate Upskilling

New technologies, especially in advances in artificial intelligence, can reduce the need for specialization in certain areas, or require employees to learn the newest tools to remain leaders in their fields. We can work with companies and other organizations to create programs in the form of degrees, certificates, executive education, or just non-credit courses to help their employees gain the knowledge that their organization needs. These programs can be taught on-campus, on-site, or online, often tailored to a company's specific needs and challenges.

## Lifetime Learning

With quickly changing technologies, education can no longer end at graduation. The college will develop physical and virtual programs for alumni, and graduates of other institutions, to get new degrees, certificates, or just the knowledge they need to keep ahead of their fields and move forward in their careers.



## RESEARCH

Illinois Tech cannot establish itself as one of the strongest computing institutions without our faculty and students producing groundbreaking, impactful research both within the college and by collaborating outside of it.

The growth of cloud, mobile, and data-oriented computing requires us to look at research that crosses traditional computing subdisciplines, like programmable hardware. Growth in connectivity and ubiquitous computing requires new emphasis on areas like security and human-centered computing. Machine learning requires a larger focus on data storage, cleaning and maintenance, and the hardware and algorithms to train and execute learning tools. A future based on automation and more immersive technology requires us to focus on the future, not just the present in computing. As computing pervades disciplines across campus and into all aspects of society, we need to likewise be outward looking, ready to partner with our colleagues in other Illinois Tech colleges, businesses, government organizations including national laboratories, nonprofits, and other universities locally and globally.

Our applied mathematics strengths in optimization, statistics, finance, and data analytics fit well into this vision, as does the information technology and management program's focus on security. We must encourage joint research projects across the college and throughout the university.

Many potential research directions are described in the Strategic Target Areas above, but we must remain agile and quickly support projects that address the potential future roles that computing will play. As a moderate-sized, private university we can move quickly to stay ahead of a rapidly changing computing environment.

The college and university should provide the proper support and encouragement for our faculty to pursue government funding for individual, group, and center-level endeavors.

### Growing the Faculty

We should hire faculty that meet the needs of this strategic plan and bring strengths in computing, particularly in areas related to data science and security. Importantly, we must hire faculty who push the plan forward, resisting the urge to cover traditional areas for their own sake. We must always and only hire faculty that raise the strength of our faculty as a whole.

As we aim to fulfill the vision of tech education for all, we must attract a faculty as diverse as the students we would like to recruit. All faculty hiring will require a plan to actively reach out to and recruit the best faculty from all backgrounds, particularly those underrepresented in our current ranks.

As many universities seek to grow their diverse faculty ranks in computing, we must remain flexible in how we judge potential faculty, take risks in hiring, and welcome non-traditional roles such as joint appointments with national laboratories and corporate research labs. The college must also strengthen the roles of research and teaching professors.

### Student Research

The college should encourage and support students to actively engage in research projects. This can run from working with a particular faculty member on a funded project; REU experiences; initiatives such as SoReMo; through collaborations with the national labs; on interdisciplinary teams; and through industry-sponsored research. The college will have various symposia that will give students the opportunity to exhibit their research.





## CORPORATE RELATIONS

The college must establish strong relationships and partnerships with corporations in Chicago and elsewhere to ensure that the university and its students will play a role.

### Recruiting

By far the most important resource that companies look for from Illinois Tech is our outstanding and diverse student body. Together we can ensure that our students find quality jobs that match their talent and training, and companies can hire a strong and diverse workforce needed for their growth and continued success.

First, we must provide our students with the training and experiences that make them valued to employers. Much of the rest of this strategic plan focuses on helping our students succeed.

We should encourage and provide companies multiple opportunities to reach out to our students through on-campus and virtual career fairs, campus visits, company campus visits, and corporate days on campus.

### Internships

College of Computing students should have the opportunity and encouragement to participate in a broad and robust internship program. There are numerous corporations and organizations in the Chicago area and beyond that are willing to hire students to get a taste of working in the field, particularly for students from diverse backgrounds. Companies often use these internships to form a bond with the students, encouraging them and their peers to join them after graduation as permanent employees.

### Partnerships

The college should have an official corporate partnership program that, at different donation levels, allows companies to have preferential slots in career fairs, to have their own day on campus to meet with students, to attend partnership events to catch up with the latest research and technology in computing, to participate in a college corporate board to advise the college on its curriculum and credentials, and to have preferential access to our faculty to create projects for our students.

### Upskilling

Beyond hiring new talent from Illinois Tech's student pool, companies need to provide their own employees with the new skills to meet the challenges of a quickly changing technological landscape. The college should provide a number of options for these companies, such as traditional certificates and degrees that could be taught on-site, on-campus, or online. The college can also tailor programs for a company, developing courses or executive education specifically designed for a particular company, even using the company's own projects as case studies.

### Research

As much as the college can provide excellent instruction to our students, there is no substitute for working on current, real-world projects. Corporations, especially smaller or less tech-focused entities, often have far more challenges than they can handle in house. We can tailor projects using problems and data from corporations with faculty and student teams to analyze and create solutions. The college must make it easy to interact with corporations, to set up new projects, and to easily navigate the legal and intellectual property issues involved.

### Data Collection

The college will work with the university to collect data that keeps track of all the relationships that various units on campus have with corporations to make the best use of connections and to create agreements that provide a wide range of access. We must also keep track of where students get recruited to determine where we are succeeding and failing in preparing our students, as well as using our alumni to cultivate and expand our corporate relationships.

## DIVERSITY, EQUITY, AND INCLUSION

Computing at Illinois Tech and in general does not reflect the demographics of our city or our country. We must do better to bring in a diverse student, faculty, and staff population and to support them and make them feel that they belong to the College of Computing community.

Diversity cannot be relegated to a single section of the strategic plan; we must consider everything that we do—both in this plan and in the college—through the context of DEI, ensuring that we make choices that promote a diverse community and avoid choices that preserve the status quo.

We will continue to develop policies and out-of-the-box approaches to recruiting and retaining a strong, diverse community. The college should have a central organizing group to assist the faculty and staff in the best DEI policies. We should engage our older students and alumni as mentors and fund organizations that help promote diversity.

It is not enough just to diversify our College of Computing community. We should make sure diverse faculty, staff, and students' voices are heard, that they have a "seat at the table," and that we have diverse leadership. We can make the best decisions for the college moving forward, whether or not they are directly related to DEI, only by having a diverse process for making those decisions.

Most importantly, though, we must create a culture of respect, encouragement, and one that provides the opportunity for all students, faculty, and staff to succeed.

### Recruiting Diverse Students

If we want to succeed in educating students from all backgrounds, leading to help diversify the tech workforce in Chicago and beyond, we need to ensure we can recruit, retain, and successfully educate a broad range of students in Illinois Tech.

We have to improve the diversity of our faculty. This would contribute to both diversity and student success, as many students seek professors they can connect with or relate to. It's empowering for students to see someone that comes from a similar background succeeding in academia.

We need to engage with students in high school, middle school, and even earlier through summer and on-campus programs and by going to the schools themselves. We should expand our efforts reaching out to community colleges and developing partnerships and transfer programs, as well reaching out to historically black colleges and universities to recruit students for our graduate programs.

We will create pathway and bridge programs that allow potential students to get the background needed to succeed in our programs.

### Bronzeville

While we intend to reach out across Chicago and beyond, the university has a special relationship with the Bronzeville neighborhood, a mostly African-American, middle-class community in which Illinois Tech is located. The College of Computing has several initiatives to engage with our local community.

We have a partnership with Surge, a privately owned esports and virtual reality center being built on the north end of Bronzeville not far from campus. We will work closely with the Bronzeville Esports League and use that as an on-ramp to get those students interested in all aspects of computing. We will work with local K-12 schools providing computing activities in areas including cybersecurity with programs in the summer and during the school year. We'll provide pathways through the local community colleges that lead to computing and other degrees at Illinois Tech.



## STUDENT EXPERIENCE

While the academic enterprise will always be central to what we do, it cannot be the be-all and end-all of the student's experience. We must provide opportunities to ensure that students have a great social experience, feel safe and well both physically and emotionally, and that students get the best training to be successful in their future careers.

To meet the students' needs, we must hear from the students via surveys, focus groups, and discussions with student leaders and a new College Student Council. Often, we can do little and inexpensive changes that can make a big difference to our students if the students feel comfortable communicating their wants and needs.

Many of our students have limited resources and often have outside jobs and families to support. The college must ensure that every student has the computing tools and other resources, including a flexible time schedule, to have the opportunity to succeed in our programs.

We will work with the Ed Kaplan Family Institute for Innovation and Tech Entrepreneurship, the other colleges, and companies to develop Interprofessional Project (IPRO) Program projects that require technical knowledge and soft skills from a variety of disciplines, requiring strong teamwork to make significant progress and mirroring the skills needed to succeed in their future careers.

## Preparing Our Students for their Future

The college should lead in the new Illinois Tech Elevate Your Future initiative. Every undergraduate and graduate student in the college, if they choose to, should have internships and a solid job in their field after graduation. We must work closely with Career Services and the companies directly to connect them to our students. This is a win-win situation, as companies look to Illinois Tech for strong, diverse tech talent.

Every student should have a mentor network, fellow students and alumni, that can help them through the program and train toward an appropriate career. The college will tap its corporate network to create internship and job opportunities for our students. We will work with Career Services to over prepare students for technical interviews, often with coding challenges, and applications for those who would like to attend graduate school.

## ALUMNI RELATIONS

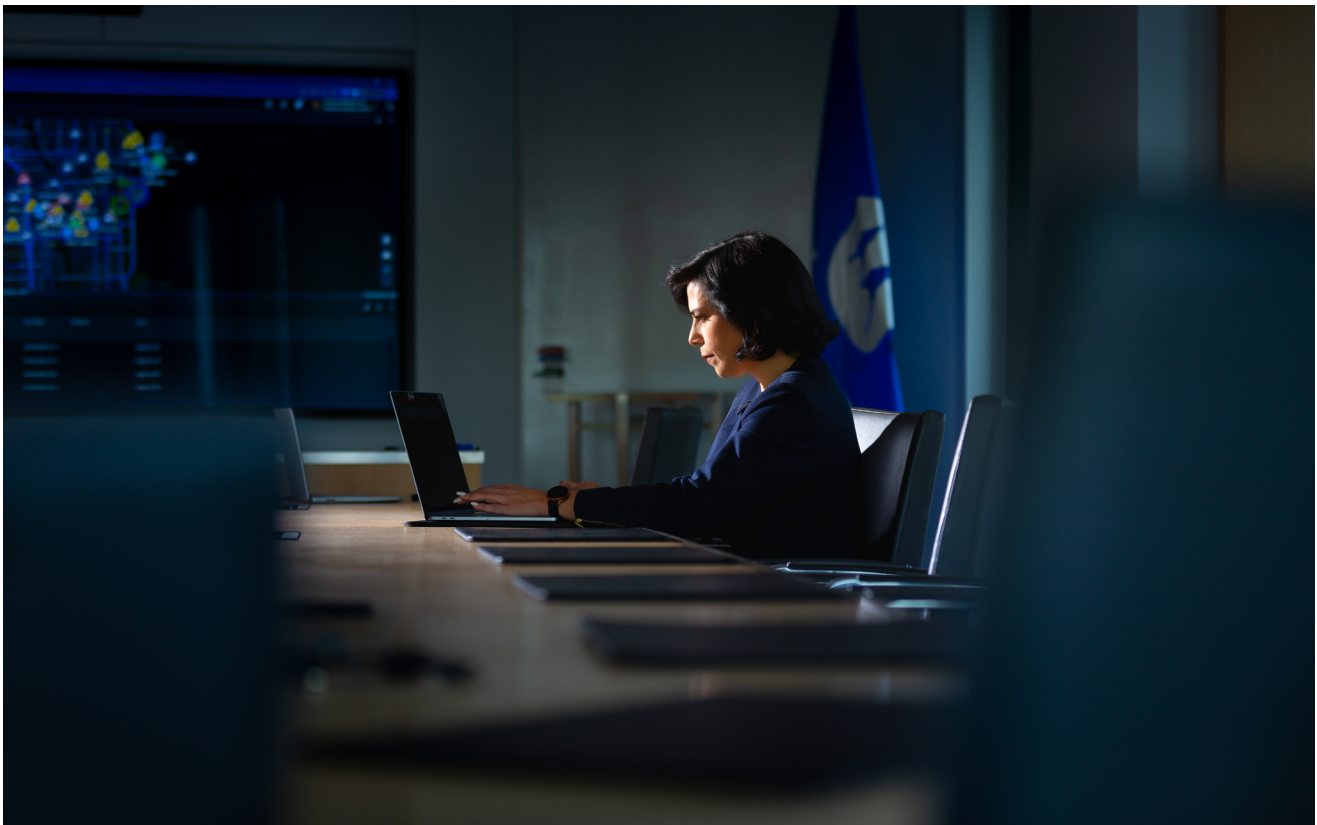
Illinois Tech has several successful alumni in the computing field, those who majored in the college's programs and those who majored in other disciplines including engineering. Active alumni have embraced our new college and the direction we are charting, but the college and university has been actively involving only a small segment of them into our college.

Our alumni can play crucial roles for our university and its students. Beyond financial support, they can provide our students with advice, mentorship, and perhaps internships and jobs. They can involve their companies with Illinois Tech on joint projects. They can come and talk to our students and give them a real-world perspective. They can give our student and faculty entrepreneurs a leg up, offering assistance from people who have succeeded before. Our successful alumni from diverse backgrounds can inspire and encourage our diverse student population, knowing that success is very possible. Alumni will benefit from bringing the diverse tech talent that we produce into their organizations.

To take advantage of all our alumni can offer, we must increase engagement with them by:

- Hosting social events in Chicago, at tech-centered cities around the world, and online for alumni to reconnect with old colleagues and make new ones
- Hosting college events around alumni campus activities such as homecoming
- Encouraging alumni to participate as attendees or speakers at our conferences, workshops, seminars, and courses
- Giving our alumni the opportunity to build up their technology skills by offering non-credit courses, certificates, and degree opportunities both on-campus and online. Education is now a life-long experience that no longer ends at graduation

Our alumni form the legacy of our college that bridges Illinois Tech from the earliest days of computing to our ever-growing digital future. We cannot succeed without their involvement and support, and we will make them proud of the legacy that the college will build here and by continuing to support their success as well.





## RESOURCES

To make the strategic plan succeed, we need to increase and develop our people, facilities, and equipment. We hope to develop these resources through increased and diversified tuition revenue, partnerships, and grants and donations from corporations, nonprofit and governmental organizations, and individuals

### Faculty

We must also grow a strong and diverse faculty, both tenure-track and lecturers, in all our departments, with hiring focused in specific areas that best move this strategic plan forward. To allow us to recruit from a broader base and extend our resources, we should consider joint hires with the national labs such as Argonne and explore the possibility of faculty who split their time at Illinois Tech and in a corporate research position.

### Partnerships

In areas where Illinois Tech has limited strength, such as media arts and health care, we should leverage partnerships and agreements with other institutions such as Columbia College Chicago, Rush University, and Rosalind Franklin University to give our students broader opportunities.

### Staff Support

Much of the strategic plan grows our college through strategic partnerships with the local community, corporations, secondary and elementary schools, community colleges and HBCUs, and with our extensive alumni base. We need people to help manage these relationships embedded in the college, sometimes as part of larger university organizations such as Advancement, admissions, Career Services, diversity, and corporate relations. We must increase our staff to take over administrative duties from our faculty to free them up to focus more on academic teaching and research.

### Facilities and Infrastructure

We need new housing for the departments of the college, which are currently spread across campus. Stuart Building, which houses the computer science department, needs major renovations at the least and will be unable to accommodate the full department after some modest growth. Moving other departments will open space to allow Armour College Engineering to expand.

Ideally, we would like to develop a major renovation and expansion of Stuart Building or a new facility that holds the entire college, with strong space for student collaboration and space for the computing technologies for today and the future.

In the shorter term we have several specific infrastructure needs:

- An expansion or replacement of the Ocient Center to allow for research computing infrastructure for research groups in the College of Computing and across campus. We should explore expanding our cloud footprint as part of this effort
- A state-of-the-art cyber range for our cybersecurity students to test offensive and defensive techniques and to hold competitions. We can also use the space for high school programs, corporate upskilling courses, and corporate and government training exercises
- An immersive tech center that focuses on esports, gaming, and virtual and augmented reality to prepare our students for the future “metaverse,” as well as to use it for training students across the university to use VR/AR for virtual training in manufacturing, engineering, architecture, and other fields and as virtual active learning spaces for scalable innovative education
- Working with engineering and other units to create a manufacturing prototype center that shows how the tight connection between digital and physical engineering shapes the future

## SUMMARY

The Illinois Tech College of Computing must live up to its promise to help the university push the tech community forward in Chicago and beyond, to bring computational thinking to every discipline on campus, and to provide students of all backgrounds meaningful roles in a changing technological society. This plan outlines many approaches toward meeting these goals, but this document cannot remain static and must be constantly reviewed as our computing landscape continues to evolve.

## GOALS

We end with a few concrete goals to measure our progress toward achieving our plan.

### External Facing

- Improve ranking in computer science to top 50 in the 2026 *U.S. News & World Report* graduate computer science survey and the top 30 in the 2030 survey
- Be the “go to” university for tech talent in Chicago by 2028 measured by:
  - A job in the field for all our graduates who want one with a six-figure median starting salary
  - At least three unicorns (billion-dollar valuation startups) from College of Computing alumni
  - At least three Fortune 500 companies announcing that they are moving to or staying in the Chicago area for reasons specifically mentioning Illinois Tech
- Establish a corporate affiliates program, with at least 30 corporate partners by 2025. At least 10 of these partners will have \$1 million-plus agreements with us for upskilling their employees and/or executives
- Create at least four new centers that jointly and directly work with national labs, government, nonprofits, and other universities by 2025

### Internal Facing

- Increase enrollment in the college 20 percent per year while maintaining a 50/50 graduate and undergraduate student split, which would double our student size by 2026
- Ensure that the diversity of our student body reflects the diversity of the community, with at least 40 percent who identify as women or transgender and 30% who are Black, Hispanic, and Native American by 2027
- Double our tenure-track faculty size by 2030 to 75, with a third of our new hires from underrepresented groups
- By 2027 the majority of courses in every department on campus will directly use data science tools in their teaching and assignments
- Create 5-10 true interdisciplinary programs (not including dual/combined degrees) with departments outside the College of Computing by 2025
- Create at least three new major centers that are funded from federal center grants or an endowed gift
- Create at least three immersive online degrees with a total of more than 10,000 students from around the globe by 2026
- Raise funds to establish a new named home for the College of Computing, either from a renovated and expanded Stuart Building or a wholly new building, that breaks ground by 2026



