

Building Connected Lives

Computation and information connect all aspects of modern scholarship, education, business, healthcare, and other facets of everyday life. The newly formed College of Computing and Informatics (CCI) is uniquely positioned to become a crossroads of innovation at Drexel University. In the coming years, CCI will establish its identity and reputation at Drexel and among computing and informatics institutions globally.

The strategic plan 2016-2021 articulates goals for CCI to build this identity through four key areas of investment: Research Excellence, Education Excellence, Institution Building, and Community Engagement.

I. Research Excellence: **Connecting Disciplines**

CCI has an uncommon strength in its diverse, multidisciplinary foundations. This intellectual breadth and dexterity allows us to pursue complex agendas that integrate technology, people, and information. In order to support interdisciplinary excellence, CCI must structure its operations at both the college and departmental levels to recognize diverse measures of impact, seed interdisciplinary understanding and values, and identify areas of potential growth that build on our unique composition and help us forge a unique identity.

CCI has several existing areas of strength that we envision can serve as the foundation of our next five years of research excellence. Specifically, within CCI we have (1) the human-centered computing expertise necessary to design systems around human cognitive, social, and organizational needs; (2) the computer science, software engineering, and computer security expertise necessary to build such systems and explore new technological possibilities; (3) the privacy, ethics, and policy expertise to make these new systems both safe and practical; (4) the library and information science expertise to provide access to and manage vast amounts of information produced and archived by new systems and devices; and (5) the data science expertise to investigate novel scientific and practical pursuits based on these massive data repositories.

The college's aforementioned expertise dovetails with multidisciplinary expertise found across Drexel University in the areas of: (1) sensors, devices, networking, and nano-computing in the College of Engineering; (2) smart fabrics and robotics found in the College of Media Arts and Design and the ExCITe center; (3) healthcare in the College

of Medicine, College of Nursing and Health Professions, and the Schools of Public Health and Biomedical Engineering, Science and Health Systems; and (4) cyber security in the Drexel University Cyber Security Institute. The results of a Drexel-wide multidisciplinary effort across these areas will help the university improve its reputation in research and education. Moreover, this vision opens doors for opportunities in (a) entrepreneurship with the creation of start-up companies in collaboration with the Close School of Entrepreneurship; (b) corporate partnerships in collaboration with our partners in the university's Innovation Neighborhood; (c) civic engagement, as many new products could be envisioned and developed to assist the elderly, handicapped, food insecure, and other populations in need; and (d) university-wide curriculum opportunities that have the potential to expose Drexel University students to a broad and highly relevant technological education that leverages some of the greatest intellectual assets of our university.

Strategic Research Goals

Increase funding levels by increasing not only the number, but the quality of the proposals we submit. To increase quality we must identify opportunities early and form the right teams for the right opportunity; administrative structures should support all phases of the grant writing process while trusting faculty to know and do their research.

Create systematic support for faculty at all levels to identify and pursue career advancement goals. This includes not only supporting our early career faculty in building a strong research agenda and tenure case, but also associate and full professors in achieving higher levels of recognition and success. This includes (1) **creating systematic mentorship opportunities**, and (2) **identifying appropriate balance between productivity in research, teaching, and service.**

Create systematic grant writing and mentorship support for PhD students to help them identify and pursue fellowship, internship, and other career advancement opportunities.

II. Education Excellence: **Connecting Learners**

The current state of educational programs in CCI is narrow growth: our computer science undergraduate degree is thriving, but other programs have been maintaining enrollment or, in some cases, declining. In the next five years, CCI must increase opportunities for not only new students, but students across campus to connect their own interests and passions to computing and informatics. Our strategic plan includes taking steps to diversify the students we serve and support universal information and computation literacies at Drexel. To help attract a broader cross-section of students to our degrees and to serve a wider cross-section of the Drexel student community, we

plan to widen our doorway in the next five years by diversifying our entry points through innovative introductory courses, degrees and undergraduate and graduate minors. Some of these efforts, such as undergraduate minors, a Master of Science in Human-Computer Interaction and Experience (MS-HCIX) and Master of Science in Data Science are already either underway or in the early stages of ideation.

Connected learners are those who build not only excellent skills, but also networks of resources and people that help them recognize, seize and even invent educational and professional opportunities. Connected learning implies a community of mentorship and support that goes beyond excellent classes. Drexel's educational strengths of entrepreneurship, experiential education, and adaptive curricula provide an environment in which CCI can create a connected student body with opportunities for internships and immediate career placement as well as long-term connections that will serve them over a lifetime of learning.

Strategic Education Goals

Create and promote a distinctive identity for CCI education. CCI cannot compete on price and must compete on quality. Quality is diffuse, and being both high quality and distinctive will provide a better basis for attracting students. Possible components of this identity include experiential learning, multidisciplinary options, and innovative use of technology in education.

Improve quality and efficiency of educational offerings. Quality and efficiency are inseparable and both must be improved together. It seems less likely that there are sweeping initiatives in this area than many tactical initiatives that will have smaller impact. But in every case, quality and efficiency need to be two sides of the same coin. For example, expanding use of undergraduate lab assistants might improve efficiency. That needs to be combined with better lab assistant training to improve quality.

Improve student retention. CCI does a good job of placing our students in competitive coops and our graduates in lucrative jobs; however, we could improve the rates at which our students persist and graduate. This will involve two types of tactical efforts: 1) improving student experience so that students make the choice to stay and 2) creating opportunities to offset costs so that those students are financially able to complete their degrees.

Expand education offerings for students not majoring in a CCI degree. This should include educational program collaborations with other academic units at Drexel similar to the MSHI and Cybersecurity degrees. It should also include minors and individual courses for other students to further support the goal of **creating a computation- and information- literate student body**. These offerings will be an important part of making CCI the hub of computing and informatics for Drexel.

III. Institution Building

CCI must continue to build its institution both socially and materially. Faculty, students, and staff are our most important resources, and our strengths in research and teaching are built on this foundation of talented and dedicated people. The nature of computing and informatics offers a unique foundation for integrating the strengths of other units and forging collaboration because of the ubiquity and embeddedness of computing and informatics in every other area of the modern university.

Socially, CCI's institutional infrastructure must accommodate and embrace diversity in all its forms. The college's intellectual diversity, already one of its strengths, remains a critical factor in improving diversity as a whole, and CCI must continue to improve its diversity by recruiting new faculty, staff, and students who complement existing people and programs. Our intellectual diversity is an advantage that can help us foster an environment that welcomes and includes a variety of viewpoints and perspectives where people from all backgrounds and persuasions can find an intellectual home. As we continue to diversify our college, we must also create appropriate incentives and support structures for our faculty and staff to continuously improve their skills befitting a world-class research and educational institution. Again, cooperation with other university units offers significant benefits: there are countless opportunities for further partnerships in blending computing and informatics with fields from the sciences, humanities, arts, engineering, and so on to create a Drexel-wide welcoming computing and information culture.

Moving forward, a critical component of CCI's social institution will be its physical institution and infrastructure. Currently, CCI's two departments are spread across three buildings, which weakens the social fabric of the college. In addition, the two largest spaces (in Rush and University Crossings) have minimal space for fostering research, social, and other collaborative interactions — critical space that enables faculty, staff, and students to bond and strengthen the college community. One of the most important future developments for the college will be solving these infrastructure issues by unifying the college in a single building, with adequate space for modern research laboratories and dedicated space for building up the social institution of the college. This goal is closely tied with that of connecting with the Innovation Neighborhood. For research, this new space is critical to having sufficient laboratory space for our faculty, students, and state-of-the-art equipment (e.g., robotics laboratories). For teaching, this new space is essential for our growth in enrollment, which demands not only classroom space but also space for laboratory classes, small-team project work, and especially our growing needs for the iCommons and Cyber Learning Center (CLC).

Strategic Institution Building Goals

Unify the college in a single building with adequate space for modern research laboratories, faculty and student workspaces, and dedicated collaborative spaces will better support research and teaching while strengthening the social fabric of the college.

Increase opportunities for socialization, collaboration, and exploration by creating social “sandboxes” where people regularly interact, get to know each other, and learn others’ organizational norms.

Recognize contributions and excellence within the College with staff, faculty, and student awards.

Increase diversity of our students and faculty. Diversity can be measured along gender, race, socio-economic and other dimensions. Efforts to diversify our student population in particular require a continual reexamination of CCI’s academic culture, degrees, and administrative structures to assess whether we are sustaining or challenging traditionally exclusionary aspects of (especially computing) culture that lead to low minority engagement and high attrition.

IV. Community Engagement

CCI sees unique opportunities for integration with Drexel’s vision for Philadelphia’s Innovation Neighborhood and West Philadelphia. The significant commitment and investment in the development of the land adjacent to several of CCI’s current buildings will support expansion of CCI’s partnerships and create opportunities for community-driven innovation in both education and research. Moreover, CCI faculty have research and teaching agendas with social and civic significance in areas like human-centered computing and information science that equip us to understand and balance the needs of the university, entrepreneurs, and West Philadelphia residents.

CCI departments and faculty have a history of technical innovation and partnership with industry, through research, educational and entrepreneurial programs. For example, the national research Center for Visual and Decision Informatics (CVDI) is a collaboration between Drexel University, the University of Louisiana at Lafayette, Tampere University of Technology in Finland, and several industry and government partners “to develop the next-generation visual and decision support tools and techniques that enable decision makers to significantly improve the way their organization’s information is interpreted and exploited.” Several research labs have funding from local industry partners. The year-long senior project course that all CCI students take has long been sponsored by companies and other external stakeholders, especially in computer science, and has often been a mutually beneficial relationship in which students go on to work at the partner companies after graduation. Our newly revised freshman design course is an

opportunity to build close relationships between students, faculty and companies earlier in students' academic careers. We anticipate new co-op opportunities and entry-level positions in which the students and companies build on these existing relationships. CCI students have been active in entrepreneurial activities including hackathons, business plan competitions, and other programs both sponsored in-part by CCI (e.g. Philly Codefest) and also those off campus. With greater space for supporting these types of events, especially with a new CCI building, CCI aims to be a center for industry-academic events that center around innovation.

We envision these partnerships as an attraction for companies to establish a presence in the innovation neighborhood, to have greater access to CCI students and faculty.

Strategic Community Engagement Goals

Develop a strong integration with the Innovation Neighborhood. The Innovation Neighborhood is essential to Drexel's strategic plan and we envision CCI's role in this development as a central one. CCI should work closely with the university to ensure a tight integration with neighborhood development.

Help build a stronger residential community – The innovation neighborhood is only one way that Drexel and CCI can foster growth in our West Philadelphia neighborhood. Creating opportunities to partner with residents of our local communities to support and meet their employment, innovation, and community needs should play a role in helping CCI identify research and education opportunities.

Expand partnerships with local industry. CCI's industrial ties have been critical for both research and education, providing applied problems and challenges for researchers and students to tackle while also establishing relationships with local groups who guide future directions through industrial boards, senior projects, and so on. CCI should expand its development of these relationships and strengthen industry's contributory role in guiding our future research and education portfolio.

Increase involvement with local area schools and universities. CCI's partnerships with local schools and universities allow us to harness local talent and contribute in critical ways to our research and educational missions. Although we have long-established relationships with, for example, elementary and high schools in West Philadelphia area, both CCI and the schools themselves would greatly benefit from increased involvement and collaboration and more visible participation within Drexel educational initiatives like DragonTeach and CASTLE.