



The Faculty of Computing & Data Sciences

Catalyzing innovative, synergistic, and integrative research and education in computing and data sciences across the landscape of academic disciplines at BU

HISTORY

The story of computing and data sciences at [Boston University](#) (BU) – one of the largest private institutions in the US with 34,000+ students, 10,000+ faculty and staff, and 17 schools and colleges – dates back to the 1980s. With early investments in relevant research areas (e.g., in artificial neural networks and high-performance computing) and in cognate degree programs (e.g., in computer science, statistics, computer engineering, information systems, neuroscience, and bioinformatics), BU had the perfect runway to launch its ambitious journey into the world of computational and data-driven discovery and innovation. A notable milestone came in 2010 with a [BU Trustee gift](#) to create the [Hariri Institute for Computing](#), a university-wide incubator that accelerates data-driven research in various disciplines by leveraging BU’s strengths in existing centers and new initiatives focused on data science, artificial intelligence, software engineering, computational science, cloud computing, digital health, data privacy, cybersecurity, and the nexus of computing, society, and law.

By 2017, buoyed by over [\\$100 million in research funding](#) secured through the Hariri Institute, by increased interest from across campus in data-driven scholarship, by the evident popularity of computing-related experiential learning programs offered through [BU Spark!](#), and by explosive enrollments in cognate degree programs, BU made its biggest investment yet by setting out to build its [Center for Computing & Data Sciences](#) – a 19-story, 380,000-square-foot, state-of-the-art iconic facility at the heart of its campus, which will act as anchor and physical manifestation of BU’s presence in data science. In tandem with the design and planning for this building, in the summer of 2018, BU assembled a [task force](#) to envision the future of data science education and research at the University. A year later, on the recommendation of the task force, [BU announced](#) the creation of the [Faculty of Computing & Data Sciences](#) (CDS): a university-wide, tenure-home and degree-granting academic unit, comprising scholars and researchers in core and applied areas of computing, computational, and data-driven inquiry. In December 2019, the Founding Director of the Hariri Institute [Azer Bestavros](#) was selected to lead this new academic unit as the [inaugural Associate Provost for Computing & Data Sciences](#). Soon after, CDS appointed a set of thirty “founding faculty members” from across the university to provide governance through the two-year bootstrapping phase of CDS, primarily to oversee faculty recruitment and academic program development.

ORGANIZATION & PROGRAMS

The model of CDS as a cross-cutting academic unit embedded in the Office of the Provost is nationally unique.

First, CDS is distinct from the existing cognate academic units in the College of Arts & Sciences ([CS](#) and [Stats](#)) and the College of Engineering ([ECE](#)) at BU. CDS augments and complements these departments without transplanting them under a new school or college. This organization recognizes the importance (and preserves the diversity) of the established academic and professional cultures of CS, ECE, and Stats. Second, CDS is an academic unit that serves as tenure home for faculty who are appointed exclusively in that unit or jointly in other units. As such, CDS is a self-governing autonomous academic unit and not merely a division or institute that acts as an administrative overlay to coordinate the priorities of other academic units. Third, providing an academic home that is distinct from those supporting the core disciplines that comprise data science allows CDS to recruit truly interdisciplinary faculty who identify more with how data science scholarship is pursued as opposed to what scholarship is leveraged by data science. Fourth, the cross-cutting nature of CDS allows it to cluster its faculty and programs around thematic areas of impact as opposed to around the typical data science subspecialties of machine learning, data mining, cloud computing, etc. These thematic areas of “[research that matters](#)” connect computing and data science with societally-relevant areas of impact that BU is strategically positioned to lead, most notably around equity, sustainability, health and biomedicine, and civic tech. To that end, much of CDS’s work is done through co-Lab partnerships, featuring a shared infrastructure and staff support for specific partner-directed deliverables and focusing on integrating basic and applied research with curricular and co-curricular activities. Finally, CDS provides a natural home for provostial,

inter-collegiate initiatives that are meant to connect multiple schools and colleges – most notably [BU Spark!](#) and the BU [CDS Faculty Fellows](#) program, both of which have been assimilated into and will be sustained through CDS. Similarly, as with the new building, CDS is a natural anchor for infrastructural investments in the computational and human support functions necessary for data science research and education programs across the entire university.

The organization of CDS as a university-wide academic unit allows it to develop “[vibrant academic experiences](#)” for BU students by introducing truly interdisciplinary programs that are more flexible than those aligned with cognate disciplines. As such, data science is not seen or treated as a specialization or track within a discipline, but rather as the transdisciplinary field it is. This allows programs offered through CDS at all levels to integrate (from the get go) key competencies such as ethical and responsible computing, experiential learning, and in-the-field training. Also, this allows for pathways with streamlined prerequisite structures, which are more inclusive of students interested in combining data science with other majors or minors, and more amenable to early engagement with external partners, facilitated by BU Spark!, in support of research as well as curricular and co-curricular activities with real-world impact. Effectively, this empowers a more diverse body of students to follow their passions, build community, and develop the “soft” skills necessary for success in a world defined by data-driven discovery and innovation.

ACCOMPLISHMENTS

Despite the extraordinary circumstances we faced only a few months after the launch of CDS due to COVID-19, the progress of CDS is nothing short of remarkable. Below are a few highlights:

- CDS mounted multiple [faculty searches](#) that enabled it to recruit two assistant professors, one associate professor, and two clinical and of-the-practice teaching faculty.
- Five faculty members from across BU joined CDS as [affiliated faculty](#), joining the original set of thirty founding faculty members in CDS, extending to eleven the number of academic departments represented within CDS.
- CDS launched a [PhD program in Computing & Data Sciences](#) and is welcoming its initial cohort of PhD students in the Fall of 2021.
- CDS launched a [BS program in Data Science](#) and is welcoming its initial cohort of undergraduate students transferring into the program from other units at BU in Fall 2021, and accepting new matriculates in Fall 2022.
- CDS added over [20 new courses](#) to BU’s curricular offerings that range from a “data speaks louder than words” introductory course to “algorithmic techniques for taming big data” and “law for algorithms” electives.
- CDS launched two co-Labs: the “[Justice Media co-Lab](#)” in Computational Journalism and the “[Racial Data Lab](#)”, formalizing partnerships with BU’s College of Communication and Center for Antiracist Research, respectively.
- CDS launched a [Civic Tech Fellowship program](#) with four faculty members appointed as inaugural fellows from disciplines as diverse as Computer Science, Journalism, and Law.
- CDS secured foundation and alumni funding for a number of its priorities, most notably the [Shibulal Family Career Development Professorship](#) and [PIT-UN funding](#) for its co-Lab programs focused on equity.
- CDS received a major [corporate gift from MassMutual](#) in support of its efforts to develop experiential learning opportunities and catalyze “research that matters” through its Impact Hubs and co-Labs.

CHALLENGES & MITIGATION STRATEGIES

BU’s decision to set up CDS as an academic unit that is distinct from existing cognate departments poses unique challenges, most notably the logistics of bootstrapping an academic unit “from scratch” and also the perception that this new unit may compete for resources and/or interfere with academic programming. On the logistical challenge, CDS’s approach is to leverage (and not replicate) existing capacities at BU, for example by tapping into the significant experience in the various offices under the provost (*e.g.*, for faculty affairs and student advising) and under the Hariri Institute (*e.g.*, for grant administration and events). On the perception of competition or interference with cognate units, CDS’s approach is to make deliberate choices that demonstrate how the whole of computing and data sciences at BU is bigger than the sum of its parts. By engaging cognate units in governance (using the founding faculty member model), by providing the right incentives to faculty affiliates, and by introducing curricula that can be leveraged by cognate units, we are able to communicate why this is not a zero-sum game. To some extent, the success of the Hariri Institute for Computing and of BU Spark! (both of which predate the creation of CDS) have provided the entire BU community with a case in point for what is possible: *The rising tide of CDS lifts all the data science boats at BU.*