



# Northeastern

## Department of Civil and Environmental Engineering: Automation and Artificial Intelligence in Urban Infrastructure Systems

2020-2021

As part of a strategic initiative in the areas of automation, robotics, and artificial intelligence in the context of Civil Infrastructure Security and Sustainable Engineering, Northeastern University seeks faculty candidates for tenured or tenure-track appointments at the assistant, associate, or full professor level with a cross-college joint appointment in the Department of Civil and Environmental Engineering and the Khoury College of Computer Sciences across the broad area of **Automation and Artificial Intelligence in Urban Infrastructure Systems**. The university is in the midst of a significant, multi-year expansion in size and scope, including faculty, facilities, and programs within several disciplines and across disciplinary boundaries.

Candidates should have the background to contribute to the advancement of knowledge through the use of humanics-centric innovative approaches based on recent developments in automation, artificial intelligence (AI), machine learning, data science, intelligent control, planning, sensors and related areas within the broad domain of applications related to Civil and Environmental Engineering. These developments are drivers of change and will dramatically impact the planning, design, operations, and control of Urban Infrastructure Systems. Candidates are especially sought with expertise in the following areas:

*Urban Mobility:* Urban transportation of people and goods is undergoing a significant transformation with the introduction of connected vehicles, intelligent infrastructure, new types of services (bike sharing, ride hailing, etc.) and concepts such as mobility on demand and mobility as a service. Coupled with technological advances related to electric, connected, and autonomous vehicles, these developments promise to change the nature of urban mobility, while addressing the significant challenges of safety, sustainability, resilience, and equity. Examples of specific areas of interest include, but are not limited to: mobility as a service, mobility on demand, electric vehicles, connected and autonomous vehicles, urban logistics.

*Interconnected Infrastructure:* Advances in automation technologies fueled by developments in AI, robotics, and sensors provide opportunities to drastically impact the design, control, maintenance, and construction of Civil and Environmental infrastructure. Examples of specific areas of interest include, but are not limited to: sensor data informed modeling, simulation and automated control of infrastructure systems against extreme events, cyber-physical-social infrastructure systems, and AI-based process automation.

*Construction Automation and Advanced Materials:* This area highlights the convergence of advanced manufacturing processes, informatics and automation in construction

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management and/or materials for the built environment. Areas of interest include AI for construction engineering (e.g., topology optimization, computer vision); robotic and automated construction in the field and pre-fabricated manufacturing; interactions of automation and humans; AI-driven materials development and selection, AI- and robotics-enabled future workforce for the architectural, engineering, and construction industry; or other domains that will drive innovations in materials and construction to overcome grand challenges surrounding the built environment.

The hiring efforts at Northeastern University seek to foster education and research across disciplinary boundaries. The successful candidates are expected to demonstrate a proven ability to sustain a research program with emphasis on interdisciplinary and translational research, teach both undergraduate and graduate classes, and be active, recognized leaders in their disciplines.

Candidates should be committed to fostering diverse and inclusive environments as well as to promoting experiential learning, which are central to a Northeastern University education.

Northeastern University is located in the heart of Boston and benefits from the intellectual and cultural vitality of an urban environment. Northeastern is a top-tier research university and premier experiential education institution, and is a National Science Foundation ADVANCE Institutional Transformation site. A university-wide vision for use-inspired transformative research that crosses traditional disciplinary boundaries has resulted in strong cross-departmental ties among the faculty, including joint and affiliate appointments across departments and colleges. The Civil and Environmental Engineering department houses major research centers, including the NIH-sponsored program Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), the NIH-sponsored Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE), the NIH-sponsored program on Environmental Influences on Child Health Outcomes (ECHO), as well as the NIST-funded center on Versatile Onboard Traffic Embedded Roaming Sensors (VOTERS). Faculty enjoy collaboration with other research centers and clusters across the College of Engineering, Khoury College of Computer Sciences, College of Science, Bouvé College of Health Sciences, College of Arts, Media and Design, D'More-McKim School of Business, and the College of Social Science and Humanities, including the NSF-funded Center for High-Rate Nanomanufacturing (CHN), the DHS-funded Homeland Security Center of Excellence on Awareness and Localization of Explosive-Related Threats (ALERT), the Institute for Experiential Robotics, the Network Science Institute (NSI), the Roux Institute, the Marine Science Center (MSC), the Coastal Sustainability Institute (CSI), the Global Resilience Institute (GRI), the George J. Kostas Research Institute for Homeland Security, the Sherman Center for Engineering Entrepreneurship Education, and entrepreneurship programs in the D'Amore-McKim School of Business.

For further information see: <https://cee.northeastern.edu/faculty/faculty-hiring/>

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**Qualifications:** A Doctorate degree in civil engineering or a related field is required by the appointment start date as well as excellence in research, teaching, and service. Senior-level candidates should have a demonstrated record of developing transformative solutions to global challenges, sustaining a research program with an emphasis on interdisciplinary and translational research, teaching both undergraduate and graduate classes, and being an active, recognized leader nationally and internationally in the discipline.

**About Northeastern University:** Founded in 1898, Northeastern is a global research university and a world leader in experiential learning. The same commitment to connecting with the world drives our use-inspired research enterprise. The university offers a comprehensive range of undergraduate and graduate programs leading to degrees through the doctorate in nine colleges and schools. Our campuses in Charlotte, N.C., San Francisco, Seattle, and Toronto are regional platforms for undergraduate and graduate learning and collaborative research. Northeastern pursues advanced research in security and materials at the Innovation Campus in Burlington, Massachusetts, and in coastal sustainability at the Marine Science Center in Nahant, Massachusetts.

**Equal Employment Opportunity:** Northeastern University is an equal opportunity employer, seeking to recruit and support a broadly diverse community of faculty and staff. Northeastern values and celebrates diversity in all its forms and strives to foster an inclusive culture built on respect that affirms inter-group relations and builds cohesion. All qualified applicants are encouraged to apply and will receive consideration for employment without regard to race, religion, color, national origin, age, sex, sexual orientation, disability status, or any other characteristic protected by applicable law. To learn more about Northeastern University's commitment and support of diversity and inclusion, please see [www.northeastern.edu/diversity](http://www.northeastern.edu/diversity).

**How to Apply:** Visit the College website <https://coe.northeastern.edu/faculty/faculty-hiring/> and click on Faculty Positions. Applications should be submitted under the position entitled **Automation and Artificial Intelligence in Civil and Environmental Engineering Systems** and should include (1) cover letter, (2) detailed resume, (3) research development statement, (4) teaching statement, (5) diversity, equity, and inclusion statement, (6) copy of one sample journal paper, and (7) list of four references with contact information. Screening of applications begins December 1, 2020 and continues until the position is filled. Questions regarding this position should be directed to Taryn Sullivan at [cee-auto-AI-search@coe.neu.edu](mailto:cee-auto-AI-search@coe.neu.edu).

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