

About Northeastern

Founded in 1898, Northeastern is a global research university and the recognized leader in lifelong learning powered by experience.

Our world-renowned experiential approach empowers our students, faculty, alumni, and partners to create impact far beyond the confines of discipline, degree, and campus.

Our locations—in Boston; the Massachusetts communities of Burlington and Nahant; Charlotte, North Carolina; the San Francisco Bay Area; Seattle; London; Toronto; and Vancouver—are nodes in a growing global university system that expands opportunities for collaborative, solutions-focused research and flexible, student-centered, lifelong learning.

Northeastern's comprehensive array of undergraduate and graduate programs—on campus, online, and in hybrid formats—lead to degrees through the doctorate in nine colleges and schools. Among these, we offer more than 140 multidisciplinary majors and degrees designed to prepare students for purposeful lives and careers



Pioneering the Wireless Internet of the Future

Contact us

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**Institute for the Wireless
Internet of Things**
at Northeastern University

The future is wireless

World-class facilities

Our research solves global problems

At Northeastern University's Institute for the Wireless Internet of Things, we're driving advances in systems and networks to transform how people connect, communicate, and thrive worldwide.

This is our vision for the next-generation Internet of Things: a continuum of untethered objects and devices, all interacting with people and the environment in ways that are exponentially faster, more efficient, and more secure.

Our research priorities

- 5G and 6G wireless systems
- Artificial intelligence and machine learning for wireless systems
- Space Internet
- Smart and connected implantable medical devices
- Smart cities, oceans, and ports
- Unmanned aerial vehicles for civil and national defense

The Northeastern difference

In our quest to create autonomous, networked systems that operate even in challenging, uncertain, and extreme conditions, we innovate by collaborating. To attract the best ideas and perspectives, our institute:

- Forges partnerships with academia, government, and industry
- Attracts distinguished faculty and exceptional students
- Provides world-leading, experience-powered education through the doctoral level



The Institute faculty offer interdisciplinary expertise, with strengths in

- Communication and networking
- Sensors and energy harvesting
- Data analytics and machine learning
- Security and blockchains

Northeastern's unique facilities include

Colosseum RF Channel Emulator, Northeastern is home to Colosseum, the world's largest radio frequency channel emulator. Developed by the U.S. Defense Advanced Research Projects Agency, Colosseum will enable the building and testing of intelligent, autonomous, collaborative wireless technologies for military and commercial use. This "electronic arena" can mimic, in real time, tens of thousands of RF channel interactions among hundreds of wireless devices within a square kilometer. Through AI, radios that weren't designed to work together can now learn to do so by optimizing the limited capacity of the electromagnetic RF spectrum.

TeraNova platform a reconfigurable and highly modular testbed for ultra-broadband communication networks in the terahertz band, a key technology for 6G. The testbed enables pioneering channel, communication and networking studies at frequencies ranging from 120 GHz to 1.1 THz with digital signal processing bandwidths of up to 32 GHz per channel.

Expeditionary Cyber and Unmanned Aerial Systems R&D Facility, an indoor-outdoor laboratory with anechoic chamber/Faraday cage and 150'x200'x60' netted area for testing unmanned aerial and ground technologies, antennas, and navigation and communications equipment

Leading-edge projects tackle connectivity challenges from data insecurity to chronic diseases, energy scarcity, disaster response, and threats to the national defense.

5G and 6G Wireless. We are conducting cutting edge research in the next generation of wireless standards that will impact all sectors of the global economy in years to come.

Machine learning for Wireless Systems and Spectrum Sharing. We're harnessing AI to develop wireless devices that can learn to share the RF spectrum optimally, in real time—and that can distinguish legitimate IoT devices from spoofers.

Open Radio Access Networks. We are leaders in enabling the next generation of open, programmable, and virtualized wireless systems based on open source software and powered by new AI algorithms.

mmWave and TeraHertz wireless. We are experts in developing systems and networks that operate at high frequency bands never used before for wireless.

Intrabody medical systems. For patients with chronic diseases, we're devising tiny sensors and actuators that transmit power and data using unconventional wireless techniques that are safer, more secure, and more energy-efficient.

Unmanned aerial and underwater IoT networking. We enable drones and other technologies to coordinate their sensing, communications, and movement autonomously, and to learn to foil adversaries by listening to the wireless spectrum and continuously changing their modes of communication.

PAWR: A new national fabric of experimental platforms. We're the project office for Platforms for Advanced Wireless Research (PAWR), a \$100-million public-private partnership that is building four shared city-scale testbeds to enable research on advanced wireless technologies and new digital applications.

