



The University of Tennessee and AT&T are Bringing 5G to the University's Knoxville Campus to Power Research, Education and Innovation

Vision Includes 5G-Powered Innovations to Help Close the Digital Divide, Reinvent Training, and Help the Military to 'See Through' Walls

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What's the news? The University of Tennessee, Knoxville (UT) and AT&T* are working together to accelerate research and develop innovative new capabilities powered by AT&T 5G using millimeter wave spectrum (5G+) and Multi-Access Edge Computing (MEC) technology on the UT campus. The AT&T 5G+ network is expected to enable the university to help make an impact on society beyond conventional engineering through potential uses in several industries including defense, public safety, healthcare, education, entertainment and banking.

UT is the hub of a vibrant research community that includes Oak Ridge National Laboratory, The University of Tennessee Research Park at Cherokee Farm, and other University of Tennessee System campuses and institutes. The addition of AT&T 5G+ technology can enhance its research capabilities and create opportunities to help solve issues that impact the university, the region, and the world.

As part of these enhancements, an expert faculty group from multiple departments in UT's Tickle College of Engineering has been created to collaborate on research and teaching, seek funding and establish partnerships with industry leaders and the UT community.

Why is this important? AT&T 5G+ and MEC will provide a high-speed private network on campus that can bring ultra-low latency, ultra-high speeds and better capacity. Combined 5G and edge technology can support unprecedented digital learning, research and development opportunities for faculty, students, administration and other researchers. Planned use cases at the UT campus powered by AT&T 5G+ and MEC include:

- **Bringing 5G to rural areas** – Mobile 5G networks can provide reliable high speed, low latency, and high capacity connectivity to rural areas and help improve the quality of life and equity within those communities, including access to telehealth, education, local economies and job creation. 5G technology can render itself to portable platforms enabling on the move type of services for gap measures to



address the digital divide. Furthermore, the use of 5G+ sensing technology renders itself to agricultural applications such as supporting precision agriculture technologies by allowing for real-time monitoring of the soil and crop health.

- **Expand academic and training offers for students** – AT&T’s 5G+ with MEC is expected to enable immersive learning experiences such as augmented reality (AR) and virtual reality (VR) to render new environments for student experimentation and learning, especially for situations that are not accessible to students due to cost, risk or feasibility. Examples of these virtual environments might include exploring nuclear power plants, the depths of the ocean, or experiencing a rocket launch. Furthermore, near real-time capabilities enables the combination of artificial intelligence (AI) and machine learning (ML) technology to gather and analyze large amounts of data using student’s biometric signatures to evaluate student performance and the amount of time they’re engaged in course material to personalize learning experiences.
- **Millimeter wave radars to see through physical barriers** – The military will explore the use of millimeter wave radars to help warfighters to “see through” physical barriers such as walls. This solution would include a portable communications system that captures and shares images through a wall, allowing soldiers with connected devices to exchange this information with each other in near real-time to help protect and defend against potential threats. The new 5G testbeds will facilitate testing, refining, and validating the low latency connectivity vital to these experiments.

When will the technology be implemented? The testbed installation for AT&T 5G+, which uses millimeter wave frequencies, is underway and expected to be completed by Fall 2021.

What are people saying?

Dr. Donde Plowman, Chancellor, University of Tennessee, Knoxville

“We are excited to bring the expertise and talent of our faculty together with the capabilities of an industry leader like AT&T to solve real world problems. Our collaboration will not only provide a better network on our campus for students, faculty, and staff, but it will also create opportunities for innovation and collaboration that could change the lives of Tennesseans.”



Dr. Ozlem Kilic, Associate Dean for Academic and Student Affairs, Tickle College of Engineering, University of Tennessee, Knoxville

“The technology behind next generation broadband systems, 5G and beyond, is expected to impact society perhaps even more than the internet. Customized and smart systems will be at our fingertips connecting all devices surrounding us, and instantly processing and optimizing information touching everything we do as an individual, community, society, and more. This collaboration with AT&T provides our research and education community at UT a platform to collaborate across disciplines to address societal needs and improve quality of life at all fronts.”

Dr. Aly Fathy, Professor, Min H. Kao Department of Electrical Engineering and Computer Science, University of Tennessee, Knoxville

“The new 5G+ testbed will lead to a smarter campus and enable massive machine-type communications that place UT research in the forefront of the automation and digitization implementation. The new resources will also complement the newly established NSF Industry University Collaborative Research Center for High Frequency Electronics and Circuits for Communication Systems. Furthermore, UT’s ongoing defense research at the Tickle College of Engineering’s ultra-wideband lab will greatly benefit from the 5G technology’s faster unprecedented connectivity, ultra-notable reliability and security, superfast broadband with lower latency and network slicing to provide almost real time data analysis and visualization. Multitude of innovation opportunities and training for our future generation of engineers and entrepreneurs will be realized.”

Randy McNally, Lieutenant Governor, Tennessee

“Access to ultra-fast 5G technology is critical to Tennessee’s economic future and for business and Tennesseans alike. This work with AT&T and the University of Tennessee is another step in setting the groundwork for future capabilities that will help unlock new economic development opportunities for Tennessee.”

Jason Porter, President, AT&T Public Sector and FirstNet

“Bringing AT&T 5G to the University of Tennessee’s already robust research community opens the door for exploring new possibilities, developing innovative solutions to real-world problems and furthering ambitions to make a positive and productive impact on society. The possibilities are wide open with 5G and we look forward to delivering the capabilities that will power the innovative solutions and applications that the students, faculty and other researchers develop.”

Joelle Phillips, President, AT&T Tennessee

“The men and women of AT&T Tennessee are turning billions of dollars of investments into high-speed connections for businesses and residents across the state, and with this announcement, the staff and students at the University of Tennessee will have access to



technology capable of unforeseen innovation. This investment is possible thanks to the positive, pro-investment policies pursued by Tennessee’s legislative leadership who created a regulatory environment welcoming of next generation networks.”

Go [here](#) for more information about AT&T’s 5G work with universities and [here](#) for more information about the University of Tennessee, Knoxville.

***About AT&T Communications**

We help family, friends and neighbors connect in meaningful ways every day. From the first phone call 140+ years ago to mobile video streaming, we @ATT innovate to improve lives. AT&T Communications is part of AT&T Inc. (NYSE:T). For more information, please visit us at att.com.

About University of Tennessee, Knoxville

The [University of Tennessee, Knoxville](#), is the state’s flagship research university, a campus of choice for outstanding undergraduates, and a premier graduate institution. As a land-grant university with an enrollment of more than 30,000, the institution fulfills its access mission through a commitment to excellence in learning, scholarship, and engagement. For more than 225 years, Volunteers have been lighting the way for others, across Tennessee and throughout the world.

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