Cohere's Wireless Waveform Enables Robust Space-based Communications in Combination with Terrestrial Cellular Services

Zak-OTFS Waveform Required to Address the Unique Challenges of Delay Spread and Doppler Impairments in Space to Make Satellite Broadband a Reality

SAN JOSE, CA, UNITED STATES, January 29, 2026 /EINPresswire.com/ -- Cohere Joins the Distinguished 6G@UT Research Center at The University of Texas at Austin

Cohere Technologies

Leading Academics Dr. Rob Calderbank (Duke) and Dr. Saif K. Mohammed (IIT Delhi) Join Cohere as Research Faculty Fellows, and Dr. Lingjia Liu (Virginia Tech) Joins Technical Advisory Board

Cohere Technologies, the innovator of Universal Spectrum Multiplier (USM) software for 4G and 5G networks and Pulsone™ Technology powered by Zak-Orthogonal Time Frequency and Space (OTFS) waveform, today announced it will accelerate efforts to bring a complete Pulsone-based solution to market, helping address numerous technology challenges in enabling space-based broadband communications.

> "The integration of sensing with communications is a massive opportunity for operators to drive revenue, while providing new services to consumers, enterprises, and mission-first government projects."
>
> *Ray Dolan, Chairman and CEO, Cohere Technologies*

This includes the rapid development of the Zak-OTFS waveform in combination with a universal neural receiver for Non-Terrestrial Networks (NTN) and Integrated Sensing and Communications (ISAC). Cohere and partners will provide mobile, defense, and space industry leaders with the flexibility to design and commercialize 5G, 6G, and other waveforms in a single solution that works seamlessly. This ambitious goal requires some of the brightest minds and world-class academic institutions in wireless technology as major contributors. Zak-OTFS is a configurable waveform that is a generalization of all existing 3GPP waveforms. It supports 4G and 5G and will support 6G once the standard is defined in 3GPP.

“There comes a time when massive innovation is required to unleash new capabilities in global communications,” said Ray Dolan, Chairman and CEO at Cohere Technologies. “We saw this 25 years ago at Flarion Technologies as we commercialized OFDM, while the cellular industry was struggling to evolve networks that were designed principally for voice and narrowband data. Predictably, the industry leaders at the time were focused on making incremental changes to existing CDMA solutions, thinking that the answer would lie in ‘making the pipe wider’ only to realize that the focus needed to also be on alignment with protocols that had already become essential for the existing wired internet.”

Over 20 years ago, OFDM-based 4G/LTE quickly became the global solution that now provides affordable broadband internet access throughout most of the world. The iPhone accelerated this transition from CDMA to OFDM, and people now take for granted that a ‘smartphone’ can really deliver an immersive computer experience. With 5G, the industry delivered more functionality and more bandwidth with new spectrum bands by continuing to build upon the OFDM foundation of 4G. Dolan continued, “Many current industry leaders are once again planning to make incremental changes to existing OFDM-based 5G to improve connectivity in space-based networks for 6G, ignoring the many challenges that clearly mandate a fresh approach.”

Challenges in Space
- Communicating with multiple satellites in orbit traveling at hypersonic speeds creates challenges in delay and Doppler that are nearly impossible to resolve with OFDM
- Efforts to network satellites compound these issues

Dolan continued, “A new approach is needed to enable NTNs to play a major role in overall space-based broadband solutions for public safety and defense. The entire area of sensing, and the integration of sensing with communications—often referred to as ‘ISAC’—is a massive opportunity for operators to drive revenue growth while providing new and valuable services to consumers, enterprises, and mission-first projects for governments. The growing awareness of the importance of sensing has created tremendous interest and partner support for our OTFS solution.”

Delivering a new approach takes time and a broad ecosystem of committed partners. Cohere Technologies pioneered OTFS starting in 2011 and demonstrated pre-commercial OTFS solutions starting in 2017. Since then, Cohere has established partnerships with technology providers and system integrators spanning the traditional cellular industry as well as the defense industry. Cohere has worked closely with several academic institutions toward the creation of a more seamless solution that includes both existing cellular and defense solutions.

“Last fall at the GPU Technology Conference (GTC) DC, we worked jointly with Cohere and Duke to demonstrate the industry’s first online, real-time neural receiver for integrated sensing and communications (ISAC) on NVIDIA’s Jetson™ AGX Orin to show what’s possible with Zak-OTFS,” said Dr. Lingjia Liu, IEEE Fellow, Andrew J. Young Professor of Electrical and Computer

Engineering and Co-Director of Wireless@Virginia Tech. “Together with OTFS, a universal waveform that can generate legacy 5G and future waveforms, the real-time universal neural receiver provides a low complexity method of detecting and demodulating the same legacy and future waveforms, enabling a path to true waveform innovation.”

Cohere joins UT Austin’s prestigious 6G@UT, one of the world’s leading 6G research centers
6G@UT is a research initiative within Wireless Networking and Communications Group (WNCG) at The University of Texas at Austin—focused on 6G wireless research, machine learning, and sensing.

“Our vision is to enable mobile operators, and national defense forces the freedom to choose the best waveform for the application, performance, and mission,” said Dr. Anton Monk, SVP of Strategy at Cohere Technologies. “We are very pleased to have the support of wireless research academics from UT Austin as we collaborate and develop a multi-waveform technology for the industry.”

“We are delighted to have Cohere Technologies join us at this critical time for wireless innovation,” said Dr. Jeff Andrews, Director at 6G@UT and the Truchard Family Chair in Engineering at The University of Texas at Austin. “Cohere’s pioneering work on Zak-OTFS and Delay-Doppler domain signal processing has been one of the most exciting developments in the wireless physical layer in recent years, and our close collaboration with Cohere will benefit our broader 6G research efforts.”

Leading Academics Join Cohere Technologies as Research Faculty Fellows
“We are pleased to welcome some of the brightest minds and world-class academic institutions in wireless technology as major contributors to this ambitious goal,” said Shlomo Rakib, co-founder and CTO at Cohere Technologies. “Leading wireless academics such as Dr. Rob Calderbank and Dr. Saif K. Mohammed have contributed through researching the viability of Zak-OTFS as a multi-waveform wireless technology. Cohere is thrilled to have them join the company as Research Faculty Fellows.”

“Zak-OTFS has the advantage of operating in the Delay-Doppler domain which gives wireless communication better stability, predictability, and ability to sense – making it ideal for NTN, high-speed mobility, and 6G use cases,” said Dr. Rob Calderbank, in his new role as Research Faculty Fellow at Cohere Technologies. “It is predictability that makes Zak-OTFS the physical layer that AI wants to see."

“Zak-OTFS can emulate 5G and legacy waveforms through simple parameter tuning or pre-coding, which allows it to operate on existing 5G hardware and infrastructure without immediate upgrades, ensuring full interoperability with current networks and devices,” said Dr. Saif K. Mohammed, Research Faculty Fellow at Cohere Technologies. ”I welcome the chance to work with the Cohere team to show the industry that a multi-modal waveform is indeed possible.”

Cohere will announce further details about Pulsone, ISAC and NTN at the annual Mobile World Congress conference in Barcelona March 2-4 (Hall 3) by VIP entrance.

About Cohere Technologies
Cohere is the innovator of Universal Spectrum Multiplier (USM) software for 4G, 5G, and Multi-G. USM significantly improves mobile networks in any FDD and TDD spectrum band – and Pulsone™ Technology which is based on the Zak-OTFS waveform for ISAC and NTN. Pulsone is a trademark of Cohere Technologies. Cohere is headquartered in San Jose, Calif. (USA).
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