

Blind Interference Cancellation for NextGen IoT Devices

Wireless connections can become unreliable when several signals use the same radio channel at the same time. This is particularly challenging for compact devices with only one antenna. The technology detects and suppresses unwanted signals directly in the receiver, helping devices maintain reliable data transmission in 5G, WiFi and other OFDM-based wireless systems – without prior network knowledge, additional antennas or network-side changes.

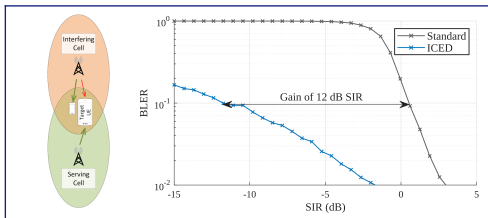


Stable wireless reception in interference-heavy environments

The technology identifies interference in the received signal, estimates the strongest source of that interference without prior coordination, and compensates for it during signal decoding. This helps single-antenna devices recover data reliably even in challenging wireless environments.

REFERENCES:

Jendraszyk & Korb, MeditCom 2026. IEEE Xplore: 11641128



Due to cell overlap, user equipment (UE) receives co-channel interference from other cells (left). The invention (ICED) significantly improves interference tolerance in single-antenna OFDM receivers. At 9 dB SNR in a TD-LTE channel with QPSK modulation, a BLER threshold of 10^{-1} is reached at a 12 dB lower signal-to-interference ratio than with a standard receiver (right).

IP RIGHTS

International application filed

2026

- 01 Blind co-channel interference mitigation without prior network coordination
- 02 Up to 100x lower block error ratio (BLER) versus standard MMSE receivers
- 03 Replaces second antenna hardware with less than 1 mm² chip logic
- 04 Ideal for 5G NR RedCap, compact IoT devices and low-cost modems

CHALLENGE

IoT devices are often designed for low cost and low complexity, but reduced antenna capability makes them more vulnerable to co-channel interference. Conventional receivers often treat interference as noise, leading to poor decoding performance, dropped links, and reduced spectral efficiency. Network-side coordination is slow, overhead-intensive, and cannot fully protect already active transmissions. This creates a clear need for efficient user-equipment-side interference mitigation.

INNOVATION

The invention provides a blind interference-aware channel estimation and demodulation concept for single-antenna receivers in OFDM-based systems such as 5G RedCap and WiFi. It identifies interfered resource blocks from signal statistics, estimates the dominant interferer's signal structure and channel without prior knowledge, and refines channel estimation before joint demodulation. This enables strong interference mitigation without additional antennas or network changes. Simulation results show up to 100-fold lower block error rates compared with standard MMSE receivers in relevant operating regions.

01 Basic principles observed · 02 Technology concept formulated · 03 Experimental proof of concept · 04 Technology validated in lab · 05 Technology validated in relevant environment · 06 Technology demonstrated in relevant environment · 07 System prototype demonstrated in operational environment · 08 System complete and qualified

TRL 08
TRL 07
TRL 06
TRL 05
TRL 04
TRL 03
TRL 02
TRL 01

Technology Readiness Level (TRL)



Innovation from Research & Science –
BayPAT markets inventions on behalf
of the Bavarian universities and
universities of applied sciences.

An invention of University of the
Bundeswehr Munich

Universität München

As one of the largest technology transfer offices in Germany, BayPAT evaluates and commercializes innovations from 28 research institutions. With our extensive experience and expertise in patenting and licensing technologies and our comprehensive range of services, we are your partner of choice. For more information visit www.baypat.de

Bayerische Patentallianz GmbH
Dr. Sindre Haugland
shaugland@baypat.de
+49 (0)89 5480177-17
Prinzregentenstr. 52
80538 München

