

Brought to you by [INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA](#)



Scopus



[Back](#)

# Interference mitigation in satellite–5G coexistence using CNN-based interference classification and power control

[IFAC Journal of Systems and Control](#) • Article • 2026 • DOI: 10.1016/j.ifacsc.2026.100436

[Parveen, Nagma](#) ; [Abdullah, Khaizuran](#)

International Islamic University Malaysia, Malaysia

[Show all information](#)

0

Citations

[Full text](#) [Export](#) [Save to list](#)

[Document](#)

[Impact](#)

[Cited by \(0\)](#)

[References \(26\)](#)

[Similar documents](#)

Abstract

The growing demand for wireless connectivity has increased pressure on shared spectrum, especially between satellite communication networks and emerging 5G systems. When these signals operate close to one another frequently, noticeable interference may occur and reduce signal quality. This study explores a deep learning-based interference mitigation approach that combines spectrogram-driven CNN classification with adaptive power control. The CNN model identifies three transmission cases satellite-only, terrestrial-only, and coexistence and achieved accuracy close to 98% during testing. Using the classification output, an adaptive power strategy was applied, resulting in an improvement in SINR from roughly 10 dB to over 27 dB under coexistence conditions. A feedforward neural network supported by a genetic algorithm was also used to fine-tune system parameters. The findings demonstrate that the proposed method strengthens terrestrial–satellite coexistence and offers a practical direction for interference control in future wireless systems. © 2026 Elsevier Ltd.

Author keywords

5G interference; CNN; Deep learning; Genetic algorithm; Satellite communication; SINR optimization

Funding details

Details about financial support for research, including funding sources and grant numbers as provided in academic publications.

| Funding sponsor                                                                                                                                                            | Funding number | Acronym |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|
| International Islamic University Malaysia<br><a href="#">See opportunities by IIUM</a>  |                | IIUM    |

Funding text

The author Nagma Parveen would like to thank the International Islamic University Malaysia for the support of the TFW2020 scheme of the Kulliyyah of Engineering.

Corresponding authors

|                      |            |
|----------------------|------------|
| Corresponding author | N. Parveen |
|----------------------|------------|