

SATELLITE-BASED SURVEILLANCE IN CONGESTED AIRSPACE

Supervisor Name: Prof. Dr. Carlos Mosquera Nartallo

Email: mosquera@gts.uvigo.es

Research Group: Signal Processing in Communications Group

The Signal Processing in Communications Group (GPSC) is specializing in the theoretical foundations and practical applications of statistical signal processing. Our core expertise lies in developing mathematical models and algorithms to solve complex problems in two main areas: digital communications and multimedia security. The group's activity is characterized by a balance between fundamental research and technology transfer, supported by a portfolio of over €9 million in competitive funding.

Researchers will join a vibrant environment to work on high-impact projects, including 5G/6G, satellite communications, and signal processing in the encrypted domain (SPED).

Keywords: Multi-Sensor Fusion | Adaptive Beamforming | Security Vulnerabilities | Random Access

Research Focus:

This research position addresses the frontier of global aviation surveillance by tackling the critical challenges of space-based ADS-B monitoring. As we shift from terrestrial to satellite-based tracking, there is a need to overcome the frequent signal collisions (garbling) caused by the massive geographic footprints of Low Earth Orbit (LEO) satellites. Given the security vulnerabilities of the unencrypted ADS-B protocol, innovative verification methods are also to be addressed to safeguard the system against spoofing and malicious "ghost" aircraft injections.