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MITIGATING SPOOFING ATTACKS IN METEOROLOGICAL NANOSATELLITE TELEMETRY: A ROS-GAZEBO SIMULATION APPROACH

Abstract

The increasing reliance on nanosatellites for in-country observation and meteorological monitoring underscores the need for secure and resilient telemetry systems. However, these systems are susceptible to spoophing attacks, which can manipulate transmitted data, comment on mission integrity, and affect orbital stability;this study investigates the effects of spoophing on the telemetry of meteorological nanosatellites simulating the scenario of attacks in the Ros-Gazebo environment and it explores how spoofed signals can change critical parameters such as health reading, speed, and sensors, potentially generating unpaired meteorological data and satellite surgery.To combat these threats, the study affects anomaly detection technique and encryption measures, assessing their effectiveness in alleviating the attack on spoofing;the results contribute to strengthening satellite communication networks, reliance on the reliability of universe-based meteorological data, and improving computer security strategies for small satellite operations.