



PAWR Project Office

Ali Gurbuz - AERPAW

Passive microwave radiometers increasingly suffer radio frequency interference (RFI) from active wireless systems, yet the community lacks real-world, labeled datasets for developing RFI detection and mitigation methods. Our research addresses this on two fronts. First, we developed RFI-Net, a physics-informed deep learning model that detects and mitigates RFI in radiometer spectrograms and outperforms conventional algorithms, but has so far been trained only on synthetic data. Second, we present a portable, SDR-based agile S-band (3.2-3.6 GHz) radiometer designed to acquire real data in unprotected, shared spectrum, operating in both stationary and UAV configurations. AERPAW's FCC Innovation Zone and experimental licenses uniquely enable controlled mid-band transmissions and aerial experimentation. Using the testbed's 5G transmitters, the radiometer collects raw data at AERPAW under controlled RFI scenarios with known waveforms, power levels, and band placements, from both the ground and the air. The resulting labeled dataset will be used to train and validate RFI-Net and successor learning based models on real interference, advancing RFI detection and mitigation for passive sensing broadly, and enabling applications such as a radiometer that detects RFI onboard and adaptively retunes to remain viable in shared spectrum.