

Short Presentation Abstract: Identifying Device with Radiometric Fingerprint

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Authentication and identification are challenging in the IoT because most advanced cryptographic algorithms are difficult to afford by constrained devices. Radiometric signatures have been used effectively to identify wireless devices based on imperfections in electronic circuits. This technique is also known as Radio frequency (RF) fingerprinting. The purely passive nature of this technique requires no extra resources for end devices which are appealing for resource-constrained applications. However, it is challenging for practical usage because most existing RF fingerprint systems are sensitive to wireless channel disturbance. In realistic scenarios, wireless channel properties change due to user movement and environment dynamics. Already small changes in the environment can lead to considerable distortion in fingerprints. Our research targets to improve the robustness of RF fingerprint systems under complex channel fading disturbance. We present RRF, a hybrid architecture that combines wireless channel simulation, signal processing, and machine learning. Our experimental results show that RRF achieves an average accuracy consistently above 99% in empirical scenarios.

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