



CSI-MURDER

Experimental analysis of CSI-based anti-sensing techniques

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OBJECTIVES

The goal of the Experiment is to study and propose an anti-sensing technique against novel device-free CSI-based localization frameworks. In particular, we intend to safeguard users' privacy by preventing both passive and active environment sensing attacks without affecting too much the ongoing Wi-Fi communications.

CHALLENGES

- Choose from the Wi-Fi sensing literature a passive localization technique and deploy it using lab facilities
- Find and implement a randomization mechanism at the Wi-Fi physical layer that makes the localization technique above useless without compromising the communication capabilities of the randomized devices, should they be actively adopting randomization or passively being randomized from an external device.

EXPERIMENT SETUP

The experiment demonstrated that it is possible i) to use the facilities in w.iLab.2 to discover the location of a victim moving in the lab (e.g. among 10 target positions as shown in Figure a) by analyzing the CSI received at a given node; and ii) to adopt a proper countermeasure at the transmitter to make the deployed localization technique useless. In fact, the countermeasure is able to modify the CSI almost arbitrarily. We show the effect of amplifying 4 adjacent subcarriers in Figure b, but in general we can generate random patterns that do not depend on the actual channel condition, so that CSI cannot be used anymore for localization purposes.



