

Open Thesis / Project

Benchmarking the Performance of UWB Platforms under Wi-Fi 6E Interference

Thesis Type

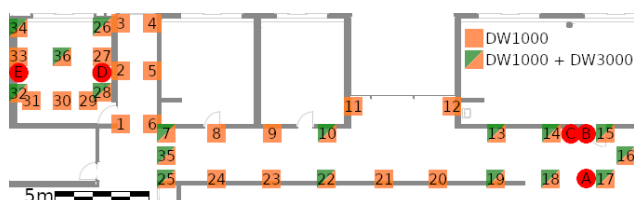
Master Project / Master Thesis

Motivation

The recent opening of the 6 GHz band has raised major concerns in the ultra-wideband (UWB) community, as Wi-Fi 6E devices are now allowed to operate in the same spectrum. Co-located Wi-Fi 6E devices represent indeed a major threat for UWB-based systems, as the latter not only share the same spectrum, but also operate at a significantly lower power than Wi-Fi devices.

Our research group was the first to confirm experimentally that both the communication and the ranging performance of UWB systems degrades severely in presence of Wi-Fi 6E traffic. As a next step, we would like to systematically benchmark and quantitatively compare the performance of different UWB platforms (e.g., the old-generation Decawave DW1000, as well as the new-generation Qorvo DW3000 and NXP Trimension) to shed light on their resilience to cross-technology interference.

To this end, we have deployed a large-scale testbed at our institute with more than 50 UWB nodes and several Wi-Fi 6E devices across a hallway and an office (see map below). Students can make use of this facility, which largely simplifies experimentation.



Goals and Tasks

Within this context, the student can explore several directions and perform different tasks, such as:

- Getting familiar with experimentation on our testbed and on how to measure the UWB communication and ranging performance;
- Systematically benchmark UWB performance in presence of different types of Wi-Fi 6E traffic.

Target Group

- Students of ICE/Telematics;
- Students of Computer Science;
- Students of Electrical Engineering.

Required Prior Knowledge

- Knowledge of networked embedded systems;
- Excellent C programming skills;
- Experience with embedded platforms and UWB technology is of advantage, but not a must.

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