## Open Thesis / Project

Studying the Impact of Wi-Fi 7 Traffic on the Performance of UWB Devices

Thesis Type
Master Project / Master Thesis

Motivation
The Wi-Fi Alliance recently introduced the Wi-Fi 7 standard, also known as IEEE 802.11be. Similarly to its predecessor (Wi-Fi 6E), Wi-Fi 7 can operate, in addition to the 2.4 GHz and 5 GHz bands, also in the unlicensed 6 GHz band. Therefore, it shares the same frequencies used by many Ultra-Wideband (UWB) devices, which may result in co-existence issues when Wi-Fi and UWB systems are co-located in the same area. Furthermore, Wi-Fi 7 should support a theoretical maximum throughput of 46 Gbit/s and introduces channels with 320 and 240 MHz bandwidth (which is much more than the 160 MHz supported by Wi-Fi 6E): this may exacerbate coexistence with UWB systems even further. Our research group was the first to confirm experimentally that both the communication and the ranging performance of UWB may degrade in presence of Wi-Fi 6E traffic [1]. In cooperation with NXP Semiconductors, we would now like to study further how Wi-Fi 7 traffic affects UWB performance and find possible countermeasures to enable the design of robust location-aware IoT applications using UWB technology. To this end, we plan to use the large-scale UWB testbed infrastructure hosted at our institute [2], which we plan to enrich with several Wi-Fi 7 devices to simplify experimentation.

Wi-Fi   UWB

[1] http://tinyurl.com/3jf7ky7t
[2] http://tinyurl.com/3dh64fbm
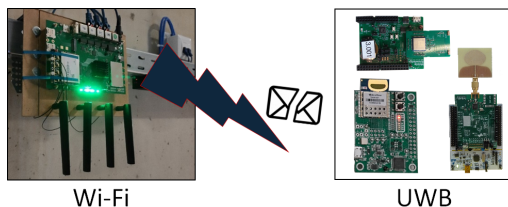
Goals and Tasks
Within this context, the student can explore several directions and perform different tasks, such as:

- Getting familiar with UWB devices (e.g., the NXP SR150) as well as on how to measure the UWB communication and ranging performance;
- Getting familiar with experimentation on our testbed infrastructure;
- Systematically study the UWB communication and ranging performance in the presence of different types of Wi-Fi 7 traffic;
- Model the impact of Wi-Fi 7 traffic on the UWB communication and ranging performance analytically.

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 Linux, embedded platforms, and UWB technology is of advantage.

Contact Person

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