Open Thesis / Project

Bluetooth LE Audio: The Future of Wireless Audio?

Thesis Type

Master Project / Master Thesis

Motivation

Audio is becoming more essential than ever in our connected world — whether we're enjoying music, making calls, or using hearing aids. The demand for crystal-clear, low-latency sound is rapidly increasing, and Bluetooth LE Audio[1] is stepping up to meet that demand. Powering devices like true wireless earbuds and hearing aids, it delivers exceptional sound while consuming minimal power. As this technology continues to evolve, it promises to make audio experiences smoother, more immersive, and more connected than ever before. One exciting feature within Bluetooth LE Audio is Auracast[2], a new broadcast audio technology that allows audio to be streamed to many devices at once, opening up endless possibilities for shared listening experiences. Within this context, we aim to dive deeper into Bluetooth LE Audio to better understand its potential in shaping the future of wireless audio.

[1] `https://bit.ly/bluetooth-le-audio`
[2] `https://www.bluetooth.com/auracast`

Goals and Tasks

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

- Understand how state-of-the-art Bluetooth LE Audio applications work;
- Investigate their performance and robustness for real-world applications;
- Develop sample audio applications running on a constrained IoT device (e.g., the `nRF5340-DK`);
- Elevate their BLE expertise as while tackling real-world audio challenges, bridging the gap between theory and practical application.

Target Group

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

Required Prior Knowledge

- Basic knowledge of Bluetooth Low Energy and wireless communication;
- Experience with embedded system development in C (e.g., using the Zephyr RTOS).

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