Description
Study and development of an embedded system for distributed sensing over Sub-GHz wireless network in a Smart City / Smart home context. Sensors acquisition and algorithm development for events detection. Experimentation on innovative sensors such as environmental, inertial, acoustic and ranging.

Skills required
- Sensing and wireless communication system concepts
- Digital Signal Processing
- C/C++ programming

Skills acquired during the internship
- Embedded system design
- Signal processing and firmware development
- Emerging wireless technologies

Contacts
STMicroelectronics: Roberto Sannino, roberto.sannino@st.com
TeCIP: Matteo Petracca, matteo.petracca@sssup.it
Audio and Motion DSP

Description
Study, design and development of Sensors processing algorithms based on MEMS microphones and inertial arrays:

- Audio DSP algorithm development (3D Source Localization, Noise Reduction, Compression, Blind Source Separation)
- Motion and sound contextual awareness
- Embedded implementation and optimization
- Sensors acquisition systems design
- Host side application development (Android, Windows)

Skills required
- C, MATLAB programming
- Basic audio DSP skills

Skills acquired during the work
- Embedded system design
- Signal processing and embedded development for innovative audio and sensing solutions

Contacts
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Description
Study and development of a multi node Bluetooth Low Energy (BLE) network for audio streaming applications in a low power scenario. The network will be composed of multiple synchronized STM32 nodes and will interface with Android\iOS ecosystem.

Skills required
• Basic knowledge of audio compression
• C, MATLAB, Android programming
• Wireless sensing and communication system concepts

Skills acquired during the work
• Embedded programming
• Signal processing and firmware development
• Emerging wireless technologies

Contacts
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Description
Embedded profiling, optimization and validation of different compression codecs (e.g. ADPCM, SBC, Opus..) for audio streaming over Bluetooth Low Energy (BLE) in a low power scenario. Audio quality, processing requirements and system integration feasibility evaluation.

Skills required
- C, MATLAB
- Audio compression basics
- Sensing and wireless communication system concepts

Skills acquired during the work
- Embedded programming
- Signal processing and firmware development
- Emerging wireless technologies
- Software optimization

Contacts
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