Hopping Sequence Design for Reliability improvement for Random Access in OpenWSN

The co-existence of Wi-Fi (802.11) and WSN (802.15.4) is a well investigated issue in state of the art. As they share parts of channels on the same frequency band. This problem is mostly asymmetric where the Wi-Fi poses a threat to WSN and not the other way around due to different power regulations imposed on these technologies. In our previous work [1] we have shown that a better hoping sequence design is possible. On a follow-up work [2] we have given simulative details about such a solution. However, when it comes to scheduling instead of using channel hopping the sensors can switch to interference aware scheduling. Nevertheless, the random access channel use cannot benefit from this prior planning, as the initial activation of the device and channel use is not planned. For this reason we want to apply a modified Hopping Sequence Design logic to a co-existence scenario in OpenWSN [3] with real sensors and show that this also improves the random access. Moreover, this may be the only solution to improve the reliability of the random access channel. Scope of the work:

- Evaluation of Hopping Sequence Design algorithm for Random Access
- Implementation of random access in OpenWSN followed with measurement and Tests

Requirements: Communication Background, C knowledge, prior experience with embedded firmware or desire to learn it


Murat Guersu (murat.guersu@tum.de)