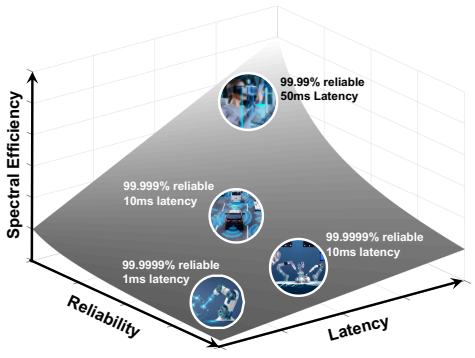
Chair of
„Secure Digital Circuits“

der Bundeswehr Universität München

Development of Dedicated Digital-Baseband Algorithms for Ultra-Reliable Low-Latency Communication Links

Introduction

Applications such as Car2Car communication, remote surgery, or real-time motion control demand for communication links that feature reliabilities of larger than 99.9999% with end-2-end latencies of a few milliseconds. Compared to state-of-the-art communication links, latency has to be reduced by more than 10x which is challenging especially when considering commonly-used block-based digital-baseband algorithms such as Fast Fourier Transforms and Low-Density-Parity-Check or Polar decoders.



Short Project Description

To avoid unnecessary stall time in digital baseband receivers and minimize receiver latency, block-based algorithms that require time-consuming aggregation of large data blocks need to be replaced by algorithms that enable a streaming receiver architecture. The goal of this project is to set up a MATLAB-based simulation environment and analyze potential streaming algorithms for demodulation and channel decoding and compare their respective performance in terms of sensitivity and receiver latency to today’s communication solutions.

Prerequisites

- Interest in wireless communication and signal processing
- MATLAB experience is helpful

What you will learn

You will gain insights into the first wave of ultra-reliable low-latency communication standards and get hands-on experience in the development of dedicated digital-baseband algorithms for IoT communication systems.

Contact

matthias.korb@unibw.de