EPIC ⟩⟩⟩

Enabling Practical Wireless Tb/s Communications with Next Generation Channel Coding

Mission

EPIC aims to develop new generation of Forward-Error-Correction (FEC) codes and technology in a manner that will serve as a fundamental enabler of practical beyond-5G (B5G) wireless Tb/s solutions.

Objectives

– Design and implement **next generation Forward-Error-Correction** for wireless Tb/s technology and beyond-5G systems.

– **Advance state-of-the-art codes,** including Polar Codes, LDPC, and Turbo Codes, and **develop the principal channel coding technology** for wireless Tb/s technology.

– Validate and demonstrate the developed FEC technology in virtual silicon tape-out and provide first-in-class wireless Tb/s FEC chipset architecture block.

– Be an authority in next generation in FEC technology and **a key contributor for standardization activities related to B5G wireless systems**.

Motivation

– Disruptive wireless link technology is fundamental for the birth of each new telecommunication generation.

– The leap to Tb/s data rates and the associated system requirements call for a paradigm shift in the conventional FEC design and development approach.

– Technology evolution observations **put practical wireless Tb/s technology** as the **next major milestone**, arguably carrying the potential for completely novel telecommunication technology generations, unprecedented in today's 5G vision.

– It is necessary to align the algorithmic FEC design and implementation problems with the novel constraints arising from wireless Tb/s use-cases as well as the emergence of a new design landscape. **Energy and power density** are becoming the most challenging implementation parameters as silicon technology moves to ever smaller nodes, e.g. 7nm.

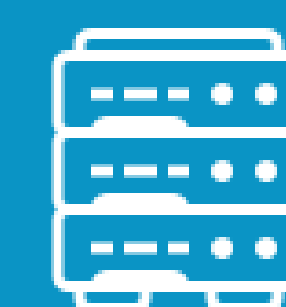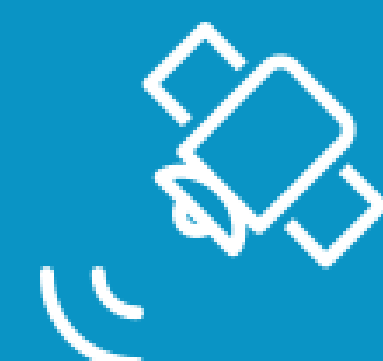## Beyond 5G Tb/s Use-Cases
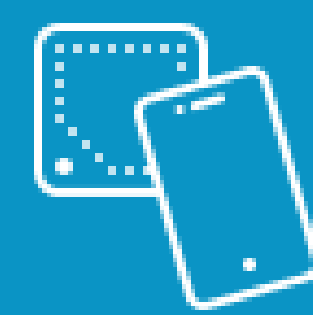
Wireless data kiosk

Virtual reality

Intra-device communication

Wireless fronthaul and backhaul

Data Centers

High-throughput satellites

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