

## **Bridging Dream and Reality: Programmable Baseband Processors for Software-Defined Radio**

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### **Abstract:**

A programmable radio baseband signal processor [2], [3] and [6] is one of the essential enablers of software-defined radio. As wireless standards evolve, the processing power needed for baseband processing increases dramatically and the underlying hardware needs to cope with various standards or even simultaneously maintaining several radio links. Meanwhile, the maximum power consumption allowed by mobile terminals is still strictly limited. These challenges require both system and architecture level innovations. This paper introduces a design methodology tutorial for radio baseband processors. Challenges and implementations of radio baseband signal processors are discussed. The LeoCore architecture is presented here as an example of a baseband processor design aimed at reducing power and silicon cost while maintaining sufficient flexibility.