Tentative Outline

The Open Signal Processing Journal

Title of thematic issue: Fixed-point design of digital signal processing circuits and systems

Guest Editors: Gabriel Caffarena

Aims & Scope:

Fixed-point arithmetic enables the implementation of energy-efficient digital signal processing (DSP) systems and it is the preferred option for application-specific circuits and embedded systems. Floating-point arithmetic -the standard for scientific computation- shows prohibitive costs when aiming at high-performance parallel circuits or low-cost, energy-efficient embedded systems. Many DSP systems make use of fixed-point since it allows for real-time processing and because they can tolerate the inherent reduced mathematical precision of this type of arithmetic.

One of the main drawbacks of the design of fixed-point systems is the so-called word-length optimization that trades off precision with cost. In many cases this optimization is oversimplified and the actual benefits of fixed-point are not exploited at all.

In this Thematic Issue we propose to investigate techniques to perform the fixed-point design of DSP circuits and systems efficiently, for both custom architectures and CPU-based embedded systems.

Subtopics:

Topics of interest to this Special Issue include, but are not limited to, the following topics:

- Fast fixed-point noise estimation techniques.
- Efficient word-length optimization.
- Compilation of fixed-point algorithms for embedded systems.
- High-level synthesis of fixed-point algorithms for custom hardware architectures.
- Approximate computing vs. fixed-point.
- Application specific optimizations.
- Hybrid arithmetic systems: fixed-point plus floating-point

Schedule:

- ✧ Manuscript submission deadline: April, 30th, 2020
- ✧ Peer Review Due: June, 2020
- ✧ Revision Due: July,2020
- ✧ Announcement of acceptance by the Guest Editors: July 30th ,2020
- ✧ Final manuscripts due: August, 2020

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