Seminar

Bruno ZATT
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Politecnico di Torino, Maxwell Room
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Energy-Efficient Video Systems Design:
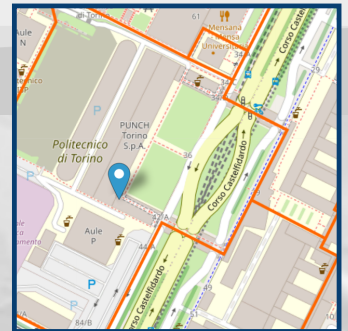## Dedicated HW, Approximate Memories, and Near-Memory Processing

Bio
Bruno Zatt is a Professor at the Federal University of Pelotas (UFPel), Pelotas, Brazil. He has 18 years research experience on algorithms and hardware architectures for video processing including 3 years at the Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, and 1-year experience as a visiting professor at the University of California, Irvine, USA. He has published over 170 papers in international journals/conferences, books, and book chapters. His expertise includes digital design, visual signal processing and coding standards such as 2D video coding (H.264, HEVC, AV1, VVC), multiview video coding (MVC), 3D video coding (3D-HEVC) and Light Fields coding (JPEG Pleno).

Abstract
The robust popularization of **videos** noticed along the last decades, allied to the omnipresence of smart mobile devices with multimedia-capable features, has led to intense development and research focusing on efficient video coding techniques, display technologies, and mobile device architectures. In this scenario, **VVC (Versatile Video Coding)** and **AV1 (AOMedia Video 1)** are key enablers of the future video systems by leading to meaningful data reduction through advanced coding techniques. However, real-time encoding/decoding for high-definition videos demands high processing effort, high memory communication and, consequently, extremely high energy consumption. As a result, the realization of real-time encoding/decoding targeting mobile systems has been posing serious challenges to industry and academia. This talk intends to briefly introduce the main concepts of video coding and present energy-efficient solutions to enable **high-definition video encoding/decoding** on mobile battery-powered embedded systems. In addition to the dedicated digital HW design perspective, we discuss the need for dedicated memory hierarchies featuring low-energy techniques such as near-memory processing and approximate memories.

Location:

Maxwell Room
DET, 5th floor

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