Joint ICTP, ICTP-SAIFR and UNESP School on Systems-on-Chip, Embedded Microcontrollers and their Applications in Research and Industry

18 - 29 October 2021
An ICTP Virtual Meeting
Trieste, Italy

Further information:
http://indico.ictp.it/event/9644/
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The school will focus on the development of scientific instrumentation based on fully programmable Systems-on-Chip (SoC) and embedded microcontrollers. The aim is to provide appropriate methodological practices and key know-how to effectively take advantage of this technology for applications in research and industry.

Modern SoC are extremely flexible and performant devices, being able to run traditional software in their powerful microprocessors and make use of the high-performance logic of their FPGA fabric. The characteristic versatility of this technology is a key aspect in allowing the implementation of advanced instruments, and is often essential for applications that require parallel data acquisition, real-time processing and high-speed data transmission.

Microcontrollers are widely used in different areas such as consumer electronics, and industrial and scientific applications. They integrate energy-efficient processing cores with application-specific peripherals in a compact device. They are used for control in many scientific instruments, and for low- to mid-performance data acquisition up to the operation of complete instruments in simpler applications.

Participants will be familiarized with professional software design tools and hardware platforms through theoretical lectures, demonstrations, tutorials and practical exercises, and will apply the acquired knowledge in projects. In addition, they will be introduced to an open-source SoC-FPGA firmware platform, providing a well-tested interface with the control computer.

Lectures will be held daily from 1pm to 5pm CET. Discussions will be held using an online collaboration platform. Candidates that need to use SoC-FPGA and embedded microcontrollers for their research projects are especially encouraged to apply.

Topics:

- Systems-on-Chip: Architecture and Design Methodology
- Hardware/Software Interface Design
- VHDL for FPGA design, Modeling and Logic Synthesis
- Embedded Microcontrollers: Architecture and Common Peripherals
- Programming in Bare-Metal and Real-time Operating Systems
- Design Automation Tools and High Level Synthesis
- FPGA for Acceleration of Artificial Intelligence and Machine Learning Algorithms
- Real-time Data Acquisition, Processing and Transmission

Directors:

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How to apply:

Online application:
http://indico.ictp.it/event/9644/

Female scientists are encouraged to apply.

Registration:

There is no registration fee.

Deadline:

1 October 2021

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