Title: Design Techniques for Energy-Quality Scalable Systems

TIME: May 21th 15:30-16:30
VENUE: Taizhou Hall Room202-2
SPEAKER: Enrico Macii ，Full Professor，Computer Engineering at Politecnico di Torino
**HOST:** Prof. Hao Yu

INTRODUCTION

Enrico Macii is a Full Professor of Computer Engineering at Politecnico di Torino. Prior to that, he was an Associate Professor (from 1998 to 2001) and an Assistant Professor (from 1993 to 1998) at the same institution. From 1991 to 1997 he was also an Adjunct Faculty at the University of Colorado at Boulder. From 2009 to 2016 he was the Vice Rector for Research at Politecnico di Torino; he was also the Vice Rector for European Affairs (2007-2009), the Vice Rector for Technology Transfer (2009-2015) and the Rector's Delegate for International Affairs (2012-2015).His research interests are in the design of electronic digital circuits and systems, with particular emphasis on low power consumption aspects. In the last decade, he has extended his research activities to areas such as bioinformatics, energy efficiency in buildings, districts and cities, sustainable urban mobility, clean and intelligent manufacturing. In the fields above he has authored over 500 scientific publications (H-index = 41, G-index = 79, Total citations: 8259, Most cited paper: 893 citations – Source: Google Scholar, October 23, 2017).

ABSTRACT

Energy efficiency is one of the key design goals in modern computing. Increasingly complex tasks are executed by mobile devices and Internet of Things end-nodes, which are expected to operate for long time interval with the limited energy budgets provided by small form-factor batteries. Fortunately, many of such tasks are error resilient, meaning that they can tolerate some relaxation in the accuracy, precision or reliability of internal operations, without a significant impact on the overall output quality. Error resilience may arise when an application's inputs are noisy or redundant, when its outputs are destined for human consumption, or when its internal computations are statistical or iterative.

Energy-Quality (EQ) scalable digital systems systematically trade off the quality of computations with energy efficiency, by relaxing the precision, the accuracy, or the reliability of internal software and hardware components in exchange for energy reductions. This design paradigm is believed to offer one of the most promising solutions to the impelling need for low-energy computing.
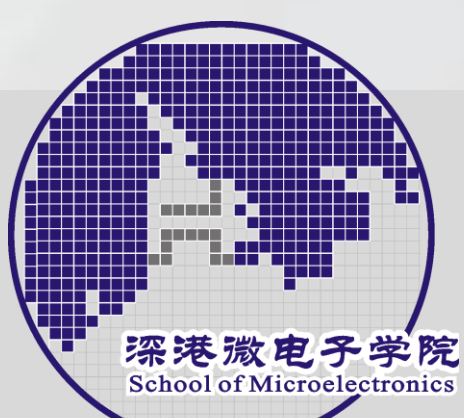
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