Title of the Tutorial:

CMOS-Based Microsystems for Biomedical Applications

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Abstract:

Research activities on biomedical microsystems are currently directed towards single-chip solutions which are becoming more and more complex, and system specifications which are more and more demanding in terms of size and power consumption. At the same time, the time-to-market and the price of biomedical microsystems must be reduced.

On the other hand, even though the performance of micromachined sensors and actuators for automotive and consumer applications is increasing every year, these micromachined devices do not necessarily meet the demanding system specifications for biomedical applications. Therefore, sophisticated readout and control electronics have to be designed and integrated with the micromachined sensors to respond to such challenges.

This tutorial will first introduce some basics aspects of CMOS technology and then the design and development of biomedical microsystems will be illustrated in detail by presenting some examples of CMOS-based biomedical microsystems comprising micro-electro-mechanical devices (membranes or cantilevers) and associated readout and control electronics.