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All-Digital Time-Mode Approaches for Mixed Analog-Digital Signal Processing

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Message from the Guest Editor

The rapid advance of CMOS technology has been geared towards optimizing the performance of digital circuits. Analog circuits not only continue to lose the benefit of specialized and process-controlled components, they must also cope with a rapidly shrinking voltage headroom, deteriorating device mismatch, and worsening linearity while satisfying ever stringent performance specifications. Time-mode signal processing where information is represented by the time difference between the occurrence of two digital events rather than the nodal voltages or branch currents of electric networks offer a viable and technology friendly means to combat difficulties encountered in design of mixed analog-digital systems. The circuits are essentially digital systems capable of performing analog and mixed analog-digital signal processing without using power-greedy and speed-impaired digital signal processors. Time-mode circuits possess a number of intrinsic and attractive characteristics, such as compatibility with technology scaling, programmability, portability, immunity to disturbances and noise, and a short design cycle, to name a few that are not possessed by their analog counterparts.

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Message from the Editor-in-Chief

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