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Talk announcement

Digital Delta-Sigma Modulators

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Wednesday May 7th, 11:15 AM,
Aula Teleensenyament, B3 Building,
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Campus Nord UPC, Barcelona

Abstract

Although Digital Delta-Sigma Modulators (DDSMs) are more widely employed commercially than analog DSMs, they are less studied. In particular, issues such as spur generation are not well understood. In the past decade, much progress has been made in this field. This presentation gives a brief introduction to DDSMs for non-specialists, providing insights into the unusual behavior which is often observed in applications. By understanding the root cause of the behavior, novel solutions have been developed to eliminate many of the problems -such as spurs and idle tones- which have historically plagued applications containing DDSMs. Furthermore, by understanding the role of the DDSM in a complete signal processing chain, we show how the concepts of error-masking and bus-splitting can be used in novel architectures to reduce the hardware complexity or to increase throughput.

Speaker's biography Michael Peter Kennedy is Professor of Microelectronic Engineering at University College Cork (UCC). He received the BE (Electronics) degree from UCD in 1984, the MS and PhD from the University of California at Berkeley in 1987 and 1991, respectively, and the DEng from the National University of Ireland in 2010. He joined UCC as Chair of the Department of Microelectronic Engineering in 2000. He served as Dean of the Faculty of Engineering from 2003 through 2005 and as Vice-President for Research from 2005 to 2011. He has over 340 research publications (including four patents) in the fields of oscillator design, hysteresis, neural networks, nonlinear dynamics, chaos communication, mixed-signal test, and frequency synthesis. He has worked as a consultant for SMEs and multinationals in the microelectronics industry and is founding Director of the Microelectronics Industry Design Association (MIDAS Ireland) and the Microelectronic Circuits Centre of Ireland (MCCI). He was made a Fellow of the Institute of Electrical and Electronic Engineers (IEEE) in 1998 for contributions to the theory of neural networks and nonlinear dynamics and for leadership in nonlinear circuits research and education. He has received many prestigious awards including Best Paper (International Journal of Circuit Theory and Applications), the 88th IEE Kelvin Lecture, IEEE Millenium and Golden Jubilee Medals, the inaugural Royal Irish Academy Parsons Award in Engineering Sciences, and the IEEE Solid-State Circuits Society Chapter of the Year Award 2010. In 2004, he was elected to membership of the Royal Irish Academy and was made a Fellow of the Institution of Engineers of Ireland by Presidential Invitation. From 2005 to 2007, he was President of the European Circuits Society and Vice-President of the IEEE Circuits and Systems (CAS) Society (with responsibility for Europe, Africa and the Middle East). During 2012 and 2013, he was a Distinguished Lecturer of the IEEE CAS Society. He has been Secretary for International Relations of the Royal Irish Academy since 2012. He is currently chair of the PE7 Starter Grants Panel at the European Research Council.