



Delft University of Technology

From the Guest Editors

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From the Guest Editors

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National Science Foundation

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This issue of the CAS magazine presents papers that could not be accommodated in the 1st part of the Alfred Fettweis memorial special issue that appeared as the December 2018 issue. While the 1st part provided extensive views of Alfred Fettweis' personal life, scientific contributions, and several papers dealing with areas that were influenced by his scientific and technological contributions at large, many other topics could not be included due to multiple reasons which included primarily lack of space, and also the vast expanse of diverse topics that Fettweis had worked on during his long career – both before and after his formal retirement from the scientific/technical enterprise.

On a more informal note, it may be relevant to mention here that the IEEE Circuits and Systems Society, led by its two past presidents Josef Nosssek and Hari Reddy, had organized a memorial special session at the 2016 International Symposium on Circuits and Systems (ISCAS) held in Montreal, where the idea of a special issue was conceived. While several of the contributors to the part-1 and part-2 of the present special issue of the CAS magazine spoke at that session, all participants of the ISCAS 2016 special session had, at least in principle, agreed to contribute to a special issue of this type. Meanwhile, some of the articles promised at the ISCAS 2016 special session were not received in the end due to various reasons, including personal situation of the authors or timeliness of a submission appropriate for the special issue. A copy of the program, and a collage of pictures from the ISCAS 2016 special session and other events spanning Alfred Fettweis' life will be available in an upcoming issue of the IEEE CAS Newsletter.

This 2nd part essentially contains three technical papers relevant to Alfred Fettweis' contributions. All of them were originally slated for part-1, but due to restrictions on the number of pages allowed in an issue, they had to be moved to part-2. While the EiC of the CAS magazine was kind enough to allow a part-2 to accommodate lengthy papers, the choice to move these papers to part-2

was taken collectively by the EiC and the guest editors of this special issue.

The first such paper “Robust digital filter structures: a direct approach” by P. P. Vaidyanathan and Sanjit K. Mitra deals with alternate methods of deriving structurally passive digital filters directly in the digital domain that were inspired by the wave digital filters of Alfred Fettweis and had to be originally derived from continuous domain prototypes (orthogonal filters are other examples of this type). It is well known that Sanjit Mitra had been an old friend and professional colleague of Alfred Fettweis going back about 40 years, and P. P. Vaidyanathan had completed his PhD dissertation under Prof. Mitra on precisely the same topic at the University of California at Santa Barbara in the early 1980s.

The 2nd paper “Symmetry Incorporated Cost-Effective Architectures for Two-Dimensional Digital Filters” by Lan-Da Van, I-Hung Khoo, Pei-Yu Chen, and Haranatha (Hari) C. Reddy deals with VLSI implementable 2-D filter architectures incorporating different symmetries. Two-Dimensional Digital Filters had been one of Alfred Fettweis' research interests. Hari Reddy recalls that he first met Professor Fettweis in 1973 at Osmania University in Hyderabad, India, while he was working towards his Ph.D. Degree. Professor Fettweis then served as an external examiner of his Ph.D. dissertation. Since that time, Hari and Professor Fettweis interacted closely for four decades on research, CAS society administrative matters, and more importantly on personal welfare issues for which Hari has been very grateful.

The third paper of this issue on “Nonlinear circuit simulation by Alfred Fettweis' wave digital principles” is by Tim Schwerdtfeger and Anton Kummert. Anton Kummert was one of the prominent students of Alfred Fettweis who completed both his doctoral dissertation and Habilitation in Alfred's group in Bochum in the late 1980s. While the Wave Digital filters were originally proposed and used in industry for frequency filtering only, the paper attempts to establish use of the basic wave digital techniques in SPICE-like circuit simulation applications.

The abovementioned papers, including those published in part-1 of this memorial special issue, are only

a sampling of the wide variety of topics that Alfred Fettweis worked on. Many of the other topics of interest to him remain unaddressed in this two-part special issue. Such topics, among others, include switched capacitor filters, broad band matching problems, and

his foray into problems of foundational physics. We encourage readers to further explore both the topics covered in the two issues and those not presented. They all contain vectors to further research and potential new discoveries.

From the Editor *(continued from page 3)*

published in the magazine and I encourage all prospective authors to view the magazine as a venue for manuscripts not necessary limited to traditional CAS topics.

In this first issue of the year, we collected several invited papers dedicated to the memory of Prof. Alfred Fettweis that could not be accommodated in the last issue due to space limitations and late submission. For the rest of the year, we have planned some exciting feature articles and special issues and we hope that they provide further ideas of fruitful collaboration with other disciplines.

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President's Message *(continued from page 6)*

- Prof. Randall Geiger, Chair of Society Education Award Subcommittee.
- Dr. Gabriele Manganaro, Chair of Industrial Pioneer Award Subcommittee.
- Prof. Tor Sverre Lande, Chair of Mac Van Valkenburg Award Subcommittee.
- Prof. Wouter Serdijn, Chair of Meritorious Service Award Subcommittee.
- Prof. Yoshifumi Nishio, Chair of Chapter-of-the-Year Award Subcommittee, Chair of Student Travel Awards subcommittee, Chair of Pre-Doctoral Scholarship Subcommittee.
- Prof. Manuel Delgado Restituto, Chair of Biomedical Circuits and Systems Best Paper Award Subcommittee, Chair of Circuits and Systems for Video

Technology Best Paper Award Subcommittee, Chair of Darlington and Guillemín-Cauer Best Paper Awards Subcommittee, Chair of Outstanding Young Author Best Paper Award Subcommittee, Chair of Very Large Scale Integration Systems Best Paper Award Subcommittee.

- Prof. Elvis Mak, Chair of Distinguished Lecturer Selection Committee.

In 2019, we will maintain our momentum and continue to work hard to achieve our goals, i.e. to strengthen our technical leadership in the field of circuits and systems, and to create value for our members. I invite you to join us to make CASS a better home for all our members. I thank you once again for what you have done, and what great things I anticipate that you will do for the society in 2019.