February 2021 – Extraordinary Issue

CEDA Currents

IEEE Council on Electronic Design Automation

ASAP 2021: Call for Contributions

The 32nd IEEE International Conference on Application Specific Systems, Architectures and Processors (ASAP) will go virtual in 2021. The history of the ASAP conference traces back to the International Workshop on Systolic Arrays, organized in 1986 in Oxford, UK. It later developed into the International Conference on Application-Specific Array Processors. With its current title, it was organized for the first time in Chicago, USA, in 1996 and geographically has alternated between Europe and North America.

The conference covers the theory and practice of application-specific systems, architectures, and processors. Manuscripts in the following categories are welcome: *Green AI for Ubiquitous Computing*, *Diversity and Inclusion in VLSI*, and *Heterogeneous Integration*. The conference will also build upon strengths in areas that have traditionally been the focus of the conference. The submission deadline for abstracts and full paper is on March 29 and April 5, 2021, respectively, and should be submitted Easychair. Submission instructions can be found here.

ESWEEK 2021: Call for Contributions

Embedded Systems Week (ESWEEK) is the premier event covering all aspects of hardware and software design for smart, intelligent and connected computing systems. By bringing together three leading conferences (CASES, CODES+ISSS, EMSOFT), one symposium (NOCS), and several workshops and tutorials, ESWEEK allows attendees to benefit from a wide range of topics covering the state of the art in embedded systems research and development. Registered attendees can attend sessions in any of the ESWEEK conferences (CASES, CODES+ISSS, EMSOFT), the NOC symposium, tutorials, and workshops. Given the continued uncertainty, the next ESWEEK is currently planned as a virtual event. We will, however, closely monitor the situation and if it improves significantly consider a hybrid in-person/virtual event in an appropriate location that will be announced well in advance. In all cases, virtual attendance and remote presentations of accepted papers will be possible. The submission deadline for abstracts and full paper is on April 2 and April 9, 2021, respectively. More information can be found here.

CEDA Announces Hardware Security and Trust Technical Committee

In July 2020, CEDA Executive Committee approved the proposal of establishing the Hardware Security and Trust Technical Committee (HSTTC). The goal of HSTTC is to help researchers better understand the challenges and risks in the hardware security and trust domain and to help both academia and industry to develop countermeasures and solutions to hardware security and trust problems. It will provide a platform and vehicle for people to learn hardware security and trust, to share their latest findings, and to facilitate collaborations. Various activities will be arranged and can be found on the HSTTC website.

One major task of HSTTC is to organize the IEEE CEDA sponsored Asian Hardware Oriented Security and Trust Symposium. This year's AsianHOST was held virtually from Kolkata, India on Dec. 16-17, 2020. CEDA President, Dr. Yao-Wen Chang and Vice President for Activities, Dr. Tsung-Yi Ho, joined the opening session to congratulate HSTTC and AsianHOST, which attracted a record-breaking 136 attendees.

HSTTC has teamed with the Warren B. Nelms Institute for the Connected World at University of Florida to create a website on "CAD for Assurance" for faculty, students, postdocs, and practitioners in the hardware security community to disseminate their work. The goal of this project is to assemble information on all CAD for trust/assurance activities related to electronic hardware and systems in one place and timely share these with the broader community of researchers and practitioners, with an easy-to-search and easy-to-access interface. There will also be a series of virtual CAD-for-Assurance tool training webinars and demos by the tool developers starting in February 2021. Stay tuned!

The founding co-chairs of HSTTC are Dr. Gang Qu (University of Maryland) and Dr. Yier Jin (University of Florida). HSTTC is open for contributors, volunteers, and sponsors. Please email Dr. Gang Qu if you are interested.

Chapter Activity: Highlights of EDAS 2020

The first IEEE CASS/CEDA Seasonal School on Electronic Design Automation - EDAS 2020 occurred as a virtual event from 7-11 December 2020.

It was organized by researchers from Federal University of Santa Catarina (UFSC) and Federal University of Rio Grande do Sul (UFRGS), members of the CEDA Brazil Chapter and CASS Rio Grande do Sul Chapter.

EDAS 2020 program offered 21 talks, a hands-on tutorial, three poster sessions, and three panels, comprising a total of 40 hours of activities. The talks covered the VLSI design flow in 30 hours, from logic synthesis to placement and

routing, with special attention to optimization techniques and challenges for advanced CMOS technology nodes. Disruptive technologies such as quantum circuits and NML circuits, and Machine Learning applications to EDA tools were also addressed. Most of the talks were given by young researchers formed in Brazilian Universities who are currently working for EDA companies such as Cadence, Synopsys, Silvaco, and Mentor. The hands-on tutorial covered the design flow using the OpenRoad tools. The panels focused on topics that could motivate the participants, mostly undergraduate and graduate students, to target their future careers to the EDA area. Eleven posters were presented in the three poster sessions. A total of 215 people, mainly undergraduate and graduate students from Brazil and other Latin American countries, attended EDAS 2020.

The EDAS 2020 organizers greatly thank the support of CASS and CEDA, the sponsor societies, SBMicro (Brazilian Microelectronics Society), SBC (Brazilian Computer Society), and the corporate sponsors Cadence, Synopsys, and Chipus Microelectronics.

Chapter Activity: EDA Summer Camp at National Taiwan University

To foster and cultivate young talents in Electronic Design Automation (EDA), CEDA sponsored National Taiwan University (NTU) to host a two-day summer camp for giving students opportunities to learn about EDA on August 20-21, 2020. This EDA summer camp promotes EDA to undergraduate students who may not be familiar with this field to encourage more talented students to join the graduate study in the EDA area. On the first day of the program, after the opening speech given by the CEDA Taipei Section Chair, Prof. Jie-Hong Roland Jiang of NTU, many alumni of the EDA program of the Graduate Institute of Electronics Engineering (GIEE) of NTU were invited to share their experiences in a luncheon. The participating students lively interacted with the seniors in person. Also, Prof. Tsung-Yi Ho from National Tsing Hua University hosted a Q&A session for students' exercise. Prof. Iris Hui-Ru Jiang of NTU delivered a lecture on EDA design flows and EDA-related labs introduced their research. On the second day, Prof. Chung-Yang Ric Huang of NTU held a mini-EDA contest of design debugging with EDA tools to stimulate teamwork. Also, the specialists from Cadence, MediaTek, Synopsys, and TSMC shared their perspectives. The 57 attendees gave fairly good feedback about the EDA camp and expressed the helpfulness to their decision about future graduate study.

Chapter Activity: EDA Workshop in Taiwan

CEDA Taipei Section sponsored the 16th EDA Workshop held in Hsinchu, Taiwan, on December 12-13, 2020. The workshop provides a platform for exchanging and discussing electronic design automation through invited lectures, seminars, and top international academic paper reports. It plays a crucial role in activating the EDA community in Taiwan and promoting its global visibility.

On the first day of the program, Mr. Jess Jing-Hsiang Yang, Engineering Director of Cadence, shared his view on "EDA in Post-Moore's Law Era." Dr. Juncheng Liu, CEO of Kneron, talked about "Hardware Design for Machine Learning." The program also includes an interactive poster session for presentations of top conference papers published in 2020 and a side meeting of IEEE CEDA and ACM SIGDA Taipei Section. On the second day, Dr. Kevin Wei, Business Development Manager of Synopsys, presented "EDA for New Era of Smart Chip Design." Dr. Da-Shan Shiu, Director of MediaTek Research Lab, introduced "What's New and Hot in MediaTek Research." The workshop ended with an award ceremony of the 2020 CAD Contest for domestic teams. There were 167 participants in this workshop.

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IN MEMORIAM

Remembering those we lost in 2020

Wolfgang Rosenstiel

1954 –2020

Sometime during 1980, I met Wolfgang Rosenstiel. He was a student of Computer Science at the University of Karlsruhe (KIT). During the next 40 years, we worked together at times, we met at numerous conferences and workshops, we visited each other regularly, and above all, we became good friends. He was a person with an extraordinary capacity for work with a contagiously positive and optimistic outlook, an excellent researcher and teacher, involved in many aspects of our profession.

During the 80's, Electronic Design Automation (EDA) established itself as a growing business, and as transistor counts for chips surpassed one million, logic synthesis became the way to design digital circuits. Research on and infrastructure to design chips were frantically being developed, also in Europe. Wolfgang was in the middle of it all. His Ph.D. was on the synthesis of data-flow circuits, part of high-level synthesis, then considered the next wave after logic synthesis.

At the FZI, a computer science research organization in Karlsruhe, he participated in the German project aimed at establishing an infrastructure to design chips in academia (EIS, "Entwurf Integrierter Schaltungen") and in the "Eurochip" project with similar goals on a European scale. Wolfgang was also a driving force behind CADDY (Carlsruhe Digital Design sYstem) and DSL (Digital Specification Language), both products of the early research on high-level synthesis in Karlsruhe. Later, he advocated for the establishment of SystemC as a system-level language for virtual prototyping. As Wolfgang broadened his interests, he proposed a highly reliable coarse-grained reconfigurable computer architecture. He also proposed a system-on-chip platform that can autonomously adapt to changing operating conditions.

Wolfgang went on to become one of the most prominent researchers in electronic design automation in Europe. He published extensively and had a brilliant academic career. He became a full professor at the department of computer engineering of the University of Tübingen in 1990. He stayed as a director of the FZI, having to commute occasionally between Tübingen and Karlsruhe. He was appointed Dean of the Faculty of Science in 2010. His research interests naturally broadened, including computer architecture, embedded systems, parallel systems, multimedia, and neural nets.

Since the early 1990s, Wolfgang did very forward-looking research on optimized machine learning techniques in various technical and medical applications, such as intelligent prosthesis control and brain-computer interfaces. Wolfgang caused international attention with his interdisciplinary research on invasive and non-invasive Brain-Computer Interfaces (BCI), obtaining the highly renowned ERC Advanced Grant in 2009. Recently he had been researching the optimization of human-machine interaction, paving the way for today's fastest BCI and opening up application fields such as the rehabilitation of stroke patients and the mental workload recognition.

He served the profession assiduously; examples include the general chair of EuroDAC and DATE (Design and Test in Europe), editor in chief of the Springer Journal "Design Automation for Embedded Systems" and chairman of the German Edacentrum.

I continued seeing Wolfgang regularly during the 90s and 00s. He would attend the Design Automation Conference (DAC) every year and spend several weeks at the University of California, Irvine. I think he toyed with the idea of moving to California, but his German roots and his extensive professional activities in Europe ultimately prevented that. As the Dean of the faculty of science, his professional commitments made traveling more difficult. I saw him the last time in October 2018 in Germany; he was as busy as ever.

May he rest in peace. We will miss him.
Raúl Camposano and Oliver Bringmann

Chung Laung (David) Liu

1934 –2020

Chung Laung (David) Liu, former president of National Tsing-Hua University (NTHU), passed away on November 7, 2020 in Taipei, Taiwan, at age 86.

Liu was born in Guagnzhou, China in 1934 and then moved to Macau with his mother and brothers to seek refuge from the Sino-Japanese War. In 1952, Liu came to Taiwan to pursue his university education at Tainan College of Engineering (the forerunner of National Cheng Kung University, NCKU). He received his B.S. degree in 1956 and then served as a 2nd lieutenant in the army for two years.

Liu started his graduate study at Massachusetts Institute of Technology (MIT) in 1958 and received his M.S. and Sc.D. in computer science both in 1960. During 1960-1972, Liu was on the MIT faculty, first as an assistant professor and later as an associate professor. In 1972, Liu joined the University of Illinois at Urbana-Champaign (UIUC) as a professor, where he was Associate Provost of UIUC 1995-1998.

Liu returned to Taiwan and became President of National Tsing Hua University (NTHU) 1998-2002. During his tenure, Liu significantly improved and expanded the campus, and raised the academic standing of the university. Liu's leadership was widely recognized by the academia and the whole society at large, and he was held in high esteem and loved by students, staff, and faculty members.

In 2000, Liu was elected as a member of Academia Sinica, the highest honor of Taiwan's academic society. He was also a fellow of the ACM and the IEEE.

In his 50-year academic career, Liu made many pioneering and milestone contributions to modern computer science and engineering in real-time systems, electronic design automation, combinatorial optimization, discrete mathematics, etc. His textbook books entitled *Elements of Discrete Mathematics* (New York: McGraw-Hill, 1985) and *Introduction to Combinatorial Mathematics* (New York: McGraw-Hill, 1968) are widely used by numerous universities globally. His paper entitled "Scheduling algorithms for multiprogramming in a hard-real-time environment", published in *JACM* in 1973, has been cited more than 12000 times. Liu received numerous prestigious awards, including the Phil Kaufman Award (a.k.a. the Nobel Prize in EDA), the IEEE Millennium Medal, the IEEE Circuits and Systems Society Golden Jubilee Medal, the ACM SIGDA Pioneering Achievement Award, the EDAA Achievement Award, the ACM ISPD Life-time Achievement Award, etc.

Liu was also an exceptional educator and the Ph.D. advisor of many renowned scholars, including Andrew Chi-Chih Yao (Turing Award Winner), Martin Wong (Dean of the College of Engineering, Chinese University of Hong Kong), and Jingsheng Jason Cong (Member of U.S. National Academy of Engineering). He received the IEEE Education Medal, the Taylor L. Booth Education Award from the IEEE Computer Society, and the Karl V. Karlstrom Education Award from the ACM.

Besides research and education, Liu also greatly influenced the development of the microelectronic industry in Taiwan. He became the Chairman of TrendFoce Corp in 2000 and served on the boards of many major Taiwan-based technology companies, such as Accton, Geothings, Faraday, FET, Macronix, MediaTek, MTI, Powerchip, UBI Pharma, and UMC.

In 2005, Liu started hosting "I Love to Talk and You Love to Laugh," a weekly radio show produced by IC Broadcasting based in Hsinchu, Taiwan. In the past decade, Liu authored 17 books in Chinese on various subjects, including life coaching, popular sciences, etc. His humor, wisdom, and optimistic spirit inspired several generations of young scholars and students.

Liu is survived by his wife Jane W.-S. Liu, and his daughter Kathleen Liu.

An online memorial website is open at https://clliu19341025.wpcomstaging.com/. Friends are welcome to express their condolences and tributes by sharing their heartfelt thoughts on the website. Donations can be made in memory of Liu to UIUC, NTHU, and NCKU.