Dear Colleague,

We proudly present the Advance Programme of **DATE 2021**. DATE combines the world's favourite electronic systems design and test conference with an international exhibition for electronic design, automation and test, from system-level hardware and software implementation right down to integrated circuit design.

Due to the worldwide COVID-19 pandemic, the DATE conference will take place online from 1-5 February 2021.

The total of 766 valid paper submissions received is shared roughly equally between the three main world regions: 36% from authors in Europe-Middle East-Africa, 30% from the Americas, 34% from Asia. Submissions involved more than 2600 authors from 33 different countries, a distribution that clearly demonstrates DATE's international character, global reach and impact.

For the 24th year in a row, DATE has prepared an exciting technical programme. With the help of the 338 members of the Technical Programme Committee, who carried out 3045 reviews (mostly four reviews per submission), 183 papers (24%) were finally selected for regular presentation and 93 additional submissions (cumulatively 36%, including all papers) for interactive presentation.

On the first day of the DATE week, **six in-depth technical tutorials** on the main topics of DATE will be given by leading experts in their respective fields. The topics cover Industrial Control Systems Security, How Emerging Memory Technology will reshape Future Computing, Software-Defined Hardware: Digital Design in the 21st Century with Chisel, Security in the Post-Quantum Era: Threats and Countermeasures, Automation goes both ways: ML for security and Security for ML, and CAD for SoC Security.

The first day of the conference will close with the **PhD Forum**, where 10 selected students who have completed their PhD thesis or are about to, can showcase their work to the academic and industrial community.

After the Opening Ceremony on Tuesday, a **plenary keynote lecture** will be given by John Martinis, from Silicon Quantum Computing and the University of California Santa Barbara, on Quantum supremacy using a programmable superconducting processor. A second **plenary keynote lecture** will be given later on the same day by Anna Grassellino, deputy CTO at Fermilab, on Superconducting Quantum Materials and Systems. On Thursday, the **Executive Track** offers hot-topic presentations on silicon photonics, optical computing, big data and healthcare given by executive speakers from companies leading the industry. Furthermore, a talk by Mauro Conti from University of Padua, will give insights into privacy as the new dimension of computing architectures and will present the current state of research in the field.

The main conference programme from Tuesday to Thursday includes 61 technical sessions organized in parallel tracks from the four areas

D – Design Methods & Tools

A – Application Design

T – Test and Dependability

E – Embedded Systems Design

and from several special sessions on Hot Topics, such as Predictable Automotive High-Performance Platforms, 3D Integration, Lightweight Cryptography, Emerging Technologies and Architectures, Vertical IP Protection of Next-Generation Devices, Computing for Autonomy, EDA meets Quantum Computing, Algorithm Hardware Co-Design for Artificial Intelligence, Machine Learning and Logic Synthesis, Scalable Quantum Compilation, Side-Channel and Fault Attacks in Shared FPGAs, Emerging In-Memory Computing Paradigms, Hardware-Based Malware Detectors, as well as results and lessons learned from Multi-Partner Innovative Research projects. Additionally, there are numerous Interactive Presentations which are organised into eleven IP sessions.

Two Special Days in the programme will focus on areas bringing new challenges to the system design community: **Sustainable High-Performance Computing** and **Cyber-Physical Systems for I4.0 and Smart Industrial Processes**. Each of the Special Days will have a full programme of keynotes, panels, tutorials and technical presentations.

The Special Day on **Sustainable High-Performance Computing** will cover new trends in energy- and performance-oriented heterogeneous and manycore architectures, hardware acceleration, emerging memory technologies, adaptive runtime systems and programming models, exascale-ready application design, datacenter-level design and energy optimisation techniques, energy delivery and management, as well as cooling techniques. The sessions will explore innovative technologies and architectures for tomorrow's compute platforms, emerging trends in the HPC industry landscape, sustainable solutions to improve energy-efficiency in HPC as well as an embedded tutorial on IT sustainability. A particular highlight of the day will be the **keynote** given by Bill Dally, who will present NVIDIA's vision on how to achieve Sustainable High-Performance Computing via Domain-Specific Accelerators.

The Special Day on **Cyber-Physical Systems for I4.0 and Smart Industrial Processes** will focus on the deep intertwining of physical and software components to build sensor-based, communication-enabled autonomous cyber-physical systems (CPS). Such CPS represent the key enabling technology for the implementation of the Industry 4.0 (I4.0) paradigm in production systems for automotive and industrial applications, networks of consumer smart home and robotics applications, systems of systems applications for transportation and autonomous driving. This DATE Special Day will focus specifically on the use of CPS as enablers for the adoption of tools such as Digital Twins, Artificial Intelligence, Machine Learning and Data Analytics to improve the effectiveness of modern industrial processes. Specific requirements for CPS-related sensors, as well as the trends in multi-domain simulation, expanding the scope of EDA into Technical Software Markets will also be addressed. As a highlight of the special day, Philippe Magarshack from STMicroelectronics will talk about Cyber-Physical Systems for Industry 4.0: An Industrial Perspective during his luncheon keynote.

A timely Special Initiative on **Autonomous Systems Design** is held on Thursday and Friday, consisting of reviewed and invited papers as well as working sessions on self-governed and self-adaptive systems that are designed to operate in an open and evolving environment that has not been completely defined at design time. Thursday sessions will include an opening panel on Autonomous Systems Design as well as technical sessions on Reliable Autonomous Systems, Safety Assurance of Autonomous Vehicles, Design Experiences in Autonomous Systems, and Predictable Perception for Autonomous Systems. A highlight of Thursday will be the luncheon keynote on Autonomous Systems in Commercial Aviation, given by Pascal Traverse from Airbus. Friday activities for this Special Initiative will be pursued in a dedicated Friday Workshop with interactive discussions considering demonstrations, tools and invited sessions.

To inform attendees on commercial and design-related topics, there will be a full programme in the **Exhibition Theatre**, which will combine presentations by exhibiting companies on industrial design methods and tools, best-practice reports by industry leaders on their latest design projects as well as tutorials for book authors and for manufacturing SMEs seeking access to innovation funding. A special industrial keynote will be given by Siemens EDA: Digital Twins – The Future is Now.

The conference is complemented by an **exhibition, running for three days (Tuesday – Thursday),** including virtual exhibition booths from companies, live demonstration sessions and panels. The exhibition provides a unique networking opportunity and is the perfect venue for industries to meet University Professors to foster University Programmes and especially for PhD Students to meet future employers.

On Monday and Thursday, the **Young People Programme**, an initiative targeting PhD students with the goal of supporting their career development, will be held. PhD students will have the opportunity to present themselves to potential employers from the EDA and microelectronics industries and arrange interviews during the conference. The initiative also includes activities to improve networking,

seminars on how to present themselves effectively to HR representatives, and panels to stimulate discussion on how to publish effectively. A **BarCamp** and a **CareerFair** will complete this specific program for young attendees.

Academic prototypes and practical activities will be shown at the **University Booth**, where Universities and public research institutes will present software and hardware solutions in different topics like Electronic Design Automation, Hardware Design and Test, and Embedded Artificial Intelligence. DATE 2021 virtual edition features the University Booth through interactive sessions, in which exhibitors will present their prototype to online attendees in 30-minutes slots spread over the three conference days (Tuesday – Thursday). Attendees can also follow the exhibitors' presentations of the prototypes offline and asynchronously interact with authors through questions and answers.

On Friday, **five full-day workshops** cover several hot topics from areas like Autonomous Reliability and Test, System-Level Design Methods for Deep Learning on Heterogeneous Architectures, Reliability Security and Quality, and a hands-on workshop focusing on the generation and implementation of an industry-grade ASSP core.

For further information, please visit: www.date-conference.com

We wish you an exciting and memorable DATE 2021 and a successful exhibition visit.

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