

CALL FOR PAPERS

WWW.DATE-CONFERENCE.COM



DESIGN, AUTOMATION AND TEST IN EUROPE

THE EUROPEAN EVENT FOR ELECTRONIC
SYSTEM DESIGN & TEST

25 – 27 MARCH 2024
VALENCIA, SPAIN

PALACIO DE CONGRESOS VALENCIA



CONFERENCE ORGANISATION

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DATE 2024

The DATE conference is the main European event bringing together designers and design automation users, researchers and vendors as well as specialists in the hardware and software design, test and manufacturing of electronic circuits and systems. DATE puts a strong emphasis on both technology and systems, covering ICs/SoCs, reconfigurable hardware and embedded systems as well as embedded software.

The three-day event consists of a conference with regular papers, late breaking results papers and extended abstracts, complemented by timely keynotes, special days, focus sessions, embedded tutorials, half-day workshops and multi-partner project sessions. The event will also host the Young People Programme and unplugged sessions fostering the networking and the exchange of information on relevant issues, recent research outcomes and career opportunities.

DATE 2024 is the 27th edition of an event that has always been the place for researchers, young professionals and industrial partners to meet, present their research and discuss the current development and next trends, with high emphasis on social interaction.

DATE 2024 adopts the renewed format that was introduced in 2023. This means that DATE 2024 again uses an intensive three-day format, focussing on interaction as well as further strengthening the community. The vast majority of regular papers will be presented in technical sessions using short flash-presentations, where the emphasis is on poster-supported live interactions (in addition to the common

full-length presentation videos available before, during and after the conference). By this, we make sure that the community can actually do what conferences are for: meeting, discussing and exchanging.

THE CONFERENCE

The conference addresses all aspects of research into technologies for electronic and (embedded) systems engineering. It covers the design process, test and tools for design automation of electronic products ranging from integrated circuits to distributed large-scale systems. This includes both hardware and embedded software design issues. The conference scope also includes the elaboration of design requirements and new architectures for challenging application fields such as sustainable computing, Internet of Everything, augmented living, secure systems, healthcare and automotive systems. Engineers, scientists and researchers involved in innovative industrial designs are particularly encouraged to submit papers to foster feedback from design to research.

SPECIAL DAYS ON EMERGING TOPICS

The scientific research track is complemented by a set of sessions focussing on emerging topics bringing new challenges to the community, with presentations and interactions on interesting and timely issues.

Special Day “Responsible and Robust AI”

AI models have gained significant prominence across various domains in society, particularly in critical applications such as autonomous vehicles, banking, healthcare, and industry. In order to be practically applicable in embedded systems, designers are required to develop responsible and robust AI. This concept has a profound impact on integrating AI into our everyday products. Firstly, since AI will have control over various functionalities, the models must ensure the system’s robustness and security. These requirements are essential to ensure proper operation in the presence of faults or attacks. Secondly, the decisions made by AI can be subject to blame or credit. This aspect necessitates substantial efforts in explainability and fairness, which becomes even more complex when dealing with an embedded systems context, to guarantee the algorithm’s expected performance.

Within embedded AI, distributed and dynamic machine learning (ML) algorithms hold great significance for implementation on small devices, introducing additional constraints such as implementation precision and low power consumption. These constraints further contribute to the design of responsible and robust AI.

The objective of this Special Day is to showcase the latest advancements in the design and implementation of new models for responsible AI, considering hardware properties. While there will be a specific focus on „distributed ML“, the event may also address societal aspects related to responsible AI.

Sébastien Pillement (University of Nantes, FR)

Special Day “Sustainable Computing“

Energy consumption is a rapidly-increasing concern in the computing ecosystem: as the society relies heavily on computing as a tool for science and engineering, administration, education, and even entertainment, the stark increase in compute-resources

demand could make traditional ICT infrastructure unsustainable. Thus, energy efficiency must become a design dimension for computing systems and applications, at all scales. To this end, we must design and deploy sustainable (super)computing systems. Concerted efforts towards sustainable hardware and software systems are the only way to provide energy-efficient algorithms, and thus are mandatory. Despite the urgency of the problem – also in light of the Europe Green Deal – we lack the methods and tools to build systems that are sustainable by design. We must bring together system designers, tool designers, algorithm designers and domain experts, and policy makers to address the sustainability issues holistically.

Ana-Lucia Varbanescu (University of Twente, NL)

Andrea Bartolini (University of Bologna, IT)

DATE 2024 will also host a timely Special Initiative on:

Autonomous Systems Design

Fueled by the progress of Artificial Intelligence, autonomous systems are increasingly becoming integral parts of many Internet-of-Things (IoT) and Cyber-Physical Systems (CPS) applications, such as automated driving, robotics, avionics, industrial automation and smart systems in general. Autonomous systems are self-governed and self-adaptive systems that are designed to operate in an open and evolving environment, which is not completely defined at design time. This poses a unique challenge to the design and verification of dependable autonomous systems. The DATE Special Initiative on Autonomous Systems Design will include peer-reviewed papers, special sessions and interactive sessions addressing these challenges. More details and a specific call for contributions can be found online: www.date-conference.com/asd

Selma Saidi (Technische Universität Dortmund, DE)

Rolf Ernst (Technische Universität Braunschweig, DE)

UNPLUGGED SESSIONS

DATE Unplugged Sessions on The Twinning Paradigm - Come join us for stimulating brainstorm discussions in small groups about the future of digital engineering. Our focus will be on the digital twinning paradigm where virtual instances are created of a system as it is operated, maintained, and repaired (e.g., one evolving virtual instance of each individual car realized from a single design model). You will actively engage with peers in a stimulating exchange to investigate how we can take advantage of this paradigm in engineering systems and what new system engineering approaches and architectures (hardware/software) and design workflows are needed and become possible.

Pieter Mosterman (Raven Industries, US)

Hans Vangheluwe (University of Antwerp, BE)

unplugged-sessions@date-conference.com

TOPIC AREAS FOR SUBMISSION

Within the scope of the conference, the main areas of interest are organised in the following tracks. Submissions can be made to any of the track topics. For detailed descriptions of the topics, please refer to the DATE website: www.date-conference.com

Track D: Design Methods and Tools addresses design automation, design tools and hardware architectures for electronic and embedded systems. The emphasis is on methods, algorithms, and tools related to the use of computers in designing complete systems. The track focus includes significant improvements on existing design methods and tools as well as forward-looking approaches to model and design future system architectures, design flows, and environments.

Lukas Sekanina (Brno University of Technology, CZ)

This track is organised in the following topics:

- D1 System Specification and Modelling
- D2 System-Level Design Methodologies and High-Level- Synthesis
- D3 System Simulation and Validation
- DT4 Design and Test for Analog and Mixed-Signal Circuits and Systems, and MEMS
- DT5 Design and Test of Hardware Security Primitives
- DT6 Design and Test of Secure Systems

- D7 Formal Methods and Verification
 - D8 Network-on-Chip and on-chip communication
 - D9 Architectural and Microarchitectural Design
 - D10 Low-power, Energy-efficient and Thermal-aware Design
 - D11 Approximate Computing
 - D12 Reconfigurable Systems
 - D13 Logical Analysis and Design
 - D14 Physical Analysis and Design
 - D15 Emerging Design Technologies for Future Computing
 - D16 Emerging Design Technologies for Future Memories
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Track A: Application Design is devoted to the presentation and discussion of design experiences with a high degree of industrial relevance, real-world implementations, and applications of specific design and test methodologies. Contributions should illustrate innovative or record-breaking design and test methodologies, which will provide viable solutions in tomorrow’s silicon, embedded systems, and large-scale systems. In topic A8, there is the opportunity to submit 2-page papers that expose industrial research and practice. Alberto Bosio (University of Lyon, FR)

This track is organised in the following topics:

- A1 Power-efficient and Sustainable Computing
- A2 Smart Cities, Internet of Everything, Industry 4.0
- A3 Automotive Systems and Smart Energy Systems
- A4 Augmented Living and Personalised Healthcare
- A5 Secure Systems, Circuits, and Architectures
- A6 Self-adaptive and Context-aware Systems
- A7 Applications of Emerging Technologies
- A8 Industrial Experiences Brief Papers

Track T: Test and Dependability Dependability covers all test, design-for-test, reliability, and design-for-robustness issues, at system-, chip-, circuit-, and device-level for both analogue and digital electronics. Topics of interest also include diagnosis, failure mode analysis, debug and post-silicon validation challenges, and test or fault injection methods addressing system security.

Matteo Sonza Reorda (Politecnico di Torino, IT)

This track is organised in the following topics:

- T1 Modelling and Mitigation of Defects, Faults, Variability, and Reliability
- T2 Test Generation, Test Architectures, Design for Test, and Diagnosis
- T3 Dependability and System-Level Test
- DT4 Design and Test for Analog and Mixed-Signal Circuits and Systems, and MEMS
- DT5 Design and Test of Hardware Security Primitives
- DT6 Design and Test of Secure Systems

Track E: Embedded Systems Design is devoted to the modelling, analysis, design, verification and deployment of embedded software or embedded/cyber-physical systems. Areas of interest include methods, tools, methodologies and development environments for real-time systems, cyber-physical systems, networked systems, and dependable systems. Emphasis is, also, on model-based design and

verification, embedded software platforms, software compilation and integration for these systems.

Liliana Cucu (Inria, FR)

This track is organised in the following topics:

- E1 Embedded Software Architecture, Compilers and Tool Chains
- E2 Real-time, Dependable and Privacy-Enhanced Systems
- E3 Machine Learning Solutions for Embedded and Cyber-Physical Systems
- E4 Design Methodologies for Machine Learning Architectures
- E5 Design Modelling and Verification for Embedded and Cyber-Physical Systems

LATE BREAKING RESULTS

Following the successful first edition in 2023, DATE 2024 provides the community with an opportunity to present new and exciting contributions for submission as Late Breaking Results (LBR) papers. LBR papers should cover new research relevant to the DATE topics. Two types of papers can be submitted:

- 1) breakthrough approaches or novel orthogonal research directions
- 2) breakthrough results, where sufficient work has been accomplished to indicate the viability of the work

Prospective authors are invited to submit Late Breaking Results papers (2 pages and two-column format) describing original and innovative work. Authors should use the template provided on the DATE website, including author name and affiliation. For creating a successful LBR forum, the LBR submission will be peer reviewed by a wide-scope TPC committee. Accepted LBR submissions will be presented in dedicated technical sessions focussing on live interactions around the submitted work to get feedback and exchange with the DATE community.

Please note that the Late Breaking Results deadline is not an extension of the general paper submission deadline. It should also be noted that accepted Late Breaking Results papers will be published in the DATE proceedings as submitted and are expected to be camera-ready.

Aida Todri-Sanial (Eindhoven University of Technology, NL)
Pascal Vivet, (CEA, FR)
lbr@date-conference.com

COMMITTEES

A full list of the executive and programme committee members is available on the DATE website: www.date-conference.com

SPONSORS

The event is sponsored by the European Design and Automation Association, the Electronic System Design Alliance, the IEEE Council on Electronic Design Automation and the ACM Special Interest Group on Design Automation.

In cooperation with IEEE Computer Society Test Technology Technical Community (TTTC), IEEE Solid-State Circuits Society (SSCS) and IEEE Computer Society (IEEE CS).

SUBMISSION INSTRUCTIONS

All manuscripts for any technical topic of the D, A, T and E tracks must be submitted for review electronically, following the instructions on the conference website: www.date-conference.com/submission-instructions The accepted file format is PDF. Any other format and manuscripts received in hard-copy form will not be processed. All submissions require novel and complete research work supported by experimental results.

Submissions must not exceed 6 pages in length, including references. Submissions in topic A8 (Industrial Experiences Brief Papers) cannot exceed 2 pages in length and must be industrial-centric on both the content and the majority of authors' affiliations.

WARNING: It is not possible to modify the list and the order of authors once the paper is submitted and the deadline is expired. If the paper is accepted, this information will be the one used for the final publication.

All submitted papers should be formatted as close as possible to the final format: A4 pages or Letter sheets, double column, single spaced, Times or equivalent font of minimum 10pt, avoid the use of type-3 fonts. Do not use baseline stretch to compress text. Paper templates are available on the DATE website for your convenience. DATE follows a double-blind review process. To support it, submissions must not include authors' names. In addition, prior work by the same authors should be referenced in full and it should be discussed in such a way that it does not disclose that the work is from the same authors. Any submission that is not in line with the above rules will be discarded. Accepted papers not complying to the above-mentioned formatting instructions will not be included in the conference proceedings. All papers will be evaluated with regard to their suitability for the conference, originality and technical soundness. The programme committee reserves the right to reorient a submission to an extended abstract.

Submissions simultaneously under review or accepted by another conference, symposium, or journal will be rejected. Submissions for which pre-prints are available (e.g., on arXiv) are allowed, BUT these pre-prints may only be published after the DATE Technical Programme Committee meeting (7 November 2023). The authors are expected to follow all reasonable efforts to ensure that the submission is compliant with the double-blind review process.

CAMERA-READY AND PRESENTATION

Authors of accepted papers will prepare the camera-ready version of the paper, adhering to the IEEE proceedings format and will be checked through PDFeXpress. A recorded video presentation of the paper is also required, according to guidelines that will be made available. It should be noted that accepted Late Breaking Results papers will be published as submitted and are expected to be camera-ready, i.e., no separate camera-ready submission will be possible.

REGISTRATION RULE FOR ALL ACCEPTED PAPERS

Please note that each paper shall be accompanied by at least one full conference registration at the paper author rate (i.e., two paper author registrations are needed for two accepted papers, e.g., from the main author or a co-author of the paper). **DATE is a physically held conference, and not a hybrid conference.** Therefore, it is mandatory that at least one author of each accepted paper attends the session where the paper is discussed and presents the work, otherwise the paper will be deleted from the proceedings afterwards (despite full payment at the paper author rate).

FOCUS SESSIONS

Focus Sessions can take the form of (1) Panels, discussing visionary and controversial issues or (2) Hot-Topic Sessions, focusing on the introduction and discussion of new R&D problems, addressing trends in the technical domains that are of interest to the conference participants.

Focus Session proposals must consist of an extended summary of up to 1,500 words in a PDF file, describing the topic, the authors/speakers and the format, and must be submitted via the DATE website by 2 October 2023. The submitter of a Focus Session proposal will be notified of acceptance or rejection of his/her proposal by 14 November 2023. In case of acceptance, contributors of accepted Focus Sessions will be asked to submit final texts or statements of panellists, as appropriate, for publication in the proceedings as final, camera-ready manuscripts by 17 January 2024. Panel sessions are entitled to one (1) page per panellist in the proceedings; Hot-Topic Sessions are allocated a maximum of six (6) pages paper per speaker or one single paper for the entire session which should not exceed ten (10) pages.

As a rule of thumb, no more than four speakers per session should be planned for Hot-Topic Sessions. For the accepted Focus Sessions, it is the responsibility of the Focus Session organiser to ensure that the 17 January 2024 deadline is met and all the camera-ready manuscripts from their respective Focus Sessions are technically sound and meet the editorial standards of the DATE proceedings. The Focus Session Co-Chairs may decline the publication of the final manuscripts in the DATE proceedings if the above responsibility is not fulfilled. Accepted or invited speakers to the Focus Sessions will be required to register for the conference.

Catherine Le Lan (Synopsys, Inc., FR)
Olivier Sentieys (IRISA/Inria, FR)
focus-sessions@date-conference.com

Further Focus Sessions will concentrate fully on the industrial perspective and are intended as a platform for DATE conference sponsors to present their work. For more information, please contact:
K.I.T. Group GbmH Dresden, date@kitdresden.de

EMBEDDED TUTORIALS

DATE 2024 tutorial sessions are designed to provide audiences with an introduction to important topics in the DATE technical areas as well as hands-on tutorials on design automation tools. Early career professionals as well as graduate students will benefit from the introductory knowledge about important topics and tools. Mid-career professionals can attend tutorials to extend their horizons. Embedded tutorials will be integrated into the 3-day schedule of DATE. We welcome proposals for tutorial presentations in the DATE technical areas. Proposals should be submitted before 2 October 2023, via the DATE submission website. For more information, please contact:

Francisco Cazorla
(Barcelona Supercomputing Center, ES)
tutorials@date-conference.com

WORKSHOPS

DATE invites proposals for half-day workshops on emerging research and application topics in design, application, test, and embedded systems. Topics that are not directly covered in the DATE technical programme but represent new research directions with potential impact on future DATE technical areas are strongly encouraged and thus particularly welcome. As with the 2023 novel format, DATE Workshops will be integrated into the 3-day schedule of DATE and thus will be open for attendance to all DATE registered attendees. For information and detailed descriptions on how to propose a workshop, please refer to the DATE website. Proposals should be submitted electronically by 2 October 2023, via the DATE website. For more information, please contact:

Theo Theocharides (University of Cyprus, CY)
workshops@date-conference.com

MULTI-PARTNER PROJECTS

The DATE 2024 programme will include sessions dedicated to multi-partner innovative and/or highly-technological research projects addressing the DATE 2024 topics. This includes projects funded by EU schemes (Horizon Europe, EIC, H2020, ECSEL, PENTA, MSCA, COST, CleanSky, ...), nationally- and regionally-funded projects, projects funded by the European Space Agency and collaborative research projects funded by industry. The session is an excellent opportunity to present projects' contributions to the DATE community and increase the impact of dissemination and outreach activities.

Project coordinators are invited to submit their contribution presenting the concepts, work in progress, or lessons learned from the project, either in the form of a full paper or a one-page abstract. Submissions will be (not blind) peer-reviewed and must be submitted before 3 December 2023 via the DATE website. Accepted contributions will be published in the DATE 2024 proceedings.

For more information, please contact:
Maksim Jenihhin (Tallinn University of Technology, EE)
Franco Fummi (Università di Verona, IT)
mpp@date-conference.com

Projects can also showcase their vision, activities and outcomes benefitting from DATE's high visibility and networking assets, by exploiting further project dissemination options; for more information please contact:
Kathleen Schäfer, date@kitdresden.de

YOUNG PEOPLE PROGRAMME

The Young People Programme is an initiative targeting Masters/PhD students and early-stage researchers with the goal of increasing their visibility, establishing contacts and encouraging discussion about future perspectives and upcoming research initiatives. The programme includes various events.

All these activities, PhD Forum, Careers Fair – Industry, Design Contest and Student Teams Fair as well as Careers Fair – Academia and University Fair, will be held in-person, to allow a strong participation and interaction, in a format offering networking and connection opportunities.

PHD FORUM

The PhD Forum is a poster session hosted by EDAA, ACM SIGDA and IEEE CEDA for PhD students who have completed their PhD thesis within the last 12 months or who are close to completing their thesis work.

It represents an excellent opportunity for them to get exposure of and feedback on their research and for the industry to get a glance of the state of the art in system design and design automation. The abstracts and posters will be made available on the DATE website and participants have the chance to win one of two best poster awards.

Proposals can be submitted via the DATE website until 3 December 2023. For further information, please contact:

Christian Pilato (Politecnico di Milano, IT)
Dirk Stroobandt (University of Ghent, BE)
ypp-phd@date-conference.com

CAREERS FAIR – INDUSTRY & STUDENT TEAMS FAIR & DESIGN CONTEST

Careers Fair - Industry: is a platform where students (PhD and Master) and early career researchers connect with EDA and micro-electronics industries. A dedicated session allows to hear from sponsors about their companies, ongoing activities, and work culture. The Careers Fair - Industry session includes a keynote on career opportunities in a certain field of microelectronics and a panel session where Young Professionals talk about start of their careers in the industry and start-ups. Before the conference, jobseekers can attend a seminar on how to present themselves effectively to HR representatives, as well as to apply to open positions through the same HiPEAC.net online portal. That can lead to interviews arranged during DATE Conference.

Student Teams Fair: allows student teams participating in international competitions present their activities, success stories and challenges to DATE attendees and to representatives from EDA and microelectronic companies. It can lead to opportunity to receive funding and support for their future projects.

Design Contest: invites student groups to participate in a design contest, where they compete by creating a design in SkyWater130 technology. Preliminary workshops will be offered for preparing the groups for the final contest during DATE.

Anton Klotz (Cadence Design Systems, DE)
Marina Saryan (Synopsys, AM)
Sara Vinco (Politecnico di Torino, IT)
ypp-industry@date-conference.com

CAREERS FAIR – ACADEMIA & UNIVERSITY FAIR

The University Fair and Careers Fair – Academia are forums for the academic sector to interact with DATE participants. We facilitate this interaction by providing two channels:

University Fair: is an extension to the previous University Booth program and channel to foster the transfer of mature academic work to a large audience. Interested research academics are invited to submit a 1-page abstract description of their precommercial research results and prototypes. Accepted submissions will have the opportunity to present their work and demonstrate their prototype live during demonstration sessions.

Careers Fair - Academia: is a channel to prepare for the future of academic career for younger academic enthusiasts and advertise new and upcoming research initiatives with academic open positions to a large audience for established academics. Interested established academics are invited to submit a 1-page abstract description of their new research plans and the respective open position(s). Accepted submissions will have the opportunity to present their research openings. They are also invited to post a flyer of their opening(s) on the “Jobs Wall” and HiPEAC portal.

Submission deadlines are 3 December 2023 (University Fair) and 25 February 2024 (Careers Fair - Academia).

For more information, please contact:
Nele Mentens (KU Leuven, BE / Leiden University, NL)
Nima Tahernijad (Heidelberg University, DE)
ypp-academia@date-conference.com

SUBMISSION KEY DATES

D, A, T and E Papers:

10 September 2023 (abstracts)
17 September 2023 (full papers)
14 November 2023 (notification of acceptance)
17 January 2024 (camera-ready papers)
7 February 2024 (paper presentation videos)

Late Breaking Results Papers:

3 December 2023 (abstracts)
10 January 2024 (notification of acceptance)
7 February 2024 (paper presentation videos)

Special Initiative

“Autonomous Systems Design”:

4 November 2023 (abstracts)
11 November 2023 (full papers)
17 December 2023 (notification of acceptance)
17 January 2024 (camera-ready papers)
7 February 2024 (paper presentation videos)

Focus Session Proposals:

2 October 2023

Embedded Tutorials Proposals:

2 October 2023

Workshop Proposals:

2 October 2023

Multi-Partner Projects:

3 December 2023 (papers)
7 February 2024 (paper presentation videos)

Young People Programme (PhD Forum, Careers Fair - Industry & Student Teams Fair & Design Contest, Careers Fair - Academia & University Fair):

3 December 2023 / 25 February 2024

Kindly note that all deadline days apply to anywhere on earth (AoE). Deadlines are strict and no extensions will be given.