Ada europe

25th Ada-Europe

INTERNATIONAL CONFERENCE ON RELIABLE SOFTWARE TECHNOLOGIES AEiC 2021

7-10 June 2021, Virtual Event

FINAL PROGRAM

http://www.ada-europe.org/conference2021

In cooperation with

acm In-Cooperation   SIGAda   acm SIGPLAN   acm SIGBED   ARA Ada Resource Association

PRESENTATION

The 25th Ada-Europe International Conference on Reliable Software Technologies (AEiC 2021), initially scheduled to take place in Santander, Spain, will be held online from the 7th to the 10th of June 2021, using the underline.io conference platform. The conference program includes parallel tutorials on Monday 7th, and a technical program and vendor exhibition from Tuesday to Thursday. The conference also includes breaks and virtual social events that will allow networking among the participants.

The conference is the latest in a series of annual international conferences started in the early 80's, under the auspices of Ada-Europe, the international organization that promotes knowledge and use of Ada and Reliable Software in general into academia, research and industry.

The conference offers an international forum for researchers, developers and users of reliable software technologies. Presentations cover applied and theoretical work conducted to support the development and maintenance of reliable software systems.

The conference program includes three days with keynote talks, papers submitted to the journal track that are heading towards final acceptance and open-access publication, together with industrial, invited and vendor presentations and a Work-in-Progress session. Those journal track papers that get finally accepted, will appear in an open-access special issue of the Journal of Systems Architecture.

The technical sessions have pre-recorded presentation materials that can be viewed before or after the conference. There will also be live presentations that are devoted to short presentations of the highlights, allowing ample time for questions and answers with the presenter.

The virtual conference platform will offer a space under the gather.town environment to allow informal and lively gathering of the participants. This space will have different areas where a participant can approach other colleagues to talk through videoconferencing. This facility will be used for the breaks, Work-in-Progress poster session, exhibition and social events.

> The Ada-Europe conference series provides a unique opportunity for dialogue and collaboration between academics and industrial practitioners interested in reliable software.

OVERVIEW OF THE WEEK

Monday 7th	Tuesday 8th	Wednesday 9th	Thursday 10th
Welcome Social Event	Ice-Breaking Social Event and Opening	Welcome Social Event	Welcome Social Event
5 Parallel Tutorials	Technical Session 1: *Scheduling and mixed-criticality systems*	Technical Session 3: *Autonomous systems*	Technical Session 5: *Validation and verification tools*
	Keynote 1	Work-in-Progress Session	Technical Session 6: *Emerging applications with reliability requirements*
	Technical Session 2: *Software modeling*	Keynote 2	Keynote 3
	Social Event: *Bring your own regional food*	Technical Session 4: *Ada issues and Ravenscar*	Technical Session 7: *Safety challenges*
Ice-Breaking Social Event		Social Event: *Regional festivals and celebrations*	Best Presentation Award, Closing Session and Party

The program runs between 12:30 and 18:30 CEST, to allow participation from different time zones. For full details and up-to-date information, see the conference web page: http://www.ada-europe.org/conference2021

KEYNOTE 1

Tuesday 8th, 14:45 CEST

Speaker: Ángel Conde (Data Analytics and Artificial Intelligence team leader at IKERLAN, Spain)

Title: Software reliability in the Big Data era with an industry-minded focus

Short Bio

Dr. Angel Conde is currently the Data Analytics and Artificial Intelligence team leader at IKERLAN. He has focused on architecting and developing Big Data Platforms for various research and industry projects since 2015. He obtained his Ph.D. in Computer Science (UPV/EHU) for his work on Big Data, Natural Language Processing and Machine Learning techniques in order to gather semantic knowledge from textbooks written in 2016 using Wikipedia, with research visits to the Cognitive Computation Group of the University of Illinois. Moreover, he holds a M.S. in Advanced Computer Systems (UPV/EHU). He is author of many scientific articles on international journals and usually speaks on Industrial Conferences such as Big Things or the Amazon Summit about different data-related topics. Finally, he has participated in different H2020 research projects such as SAFIRE, CREMA or V-FOS.

Abstract

In order to build reliable Big Data software, we should prepare ourselves to the distributed fallacy, "A distributed system will always fail". In this way, Big Data systems have been architected for survival of multiple system failures from the ground up. We will make a little introduction about different Big Data frameworks and their architectural decisions in order to be able to survive to multiple system failures in order to be reliable.

Next, we will focus on the Industrial Internet of Things (IIoT). IIoT nowadays is an exploding trend with significant implications for the global economy. It spans industries including manufacturing, mining, agriculture, oil and gas, and utilities. It also encompasses companies that depend on durable physical goods to conduct business, such as organizations that operate hospitals, warehouses and ports or that offer transportation, logistics and healthcare services. Not surprisingly, the IIoT's potential payoff is enormous. A specific example of this potential use is the Predictive maintenance of assets, saving over scheduled repairs, reducing overall maintenance costs and eliminating breakdowns up. For example, Thames Water, one of the largest providers of water in the UK, is using sensors and real-time data to help the utility company anticipate equipment failures and respond more quickly to critical situations, such as leaks or adverse weather events. However, analyzing such large quantities of usually out-of-order real-time data from different sensors and system is a real challenge with Big Data analytics frameworks.

The final part of the talk will be composed of a hands-on workshop where we will use Apache Zeppelin, Apache Kafka, Apache Avro, Apache Cassandra and Spark´s Structured Streaming API to see how we can solve challenges of related to IIoT projects such as handling late unordered data.

All the code used along with the developer environment be available at GitHub right after the keynote.

KEYNOTE 2

Wednesday 9ᵗʰ, 15:30 CEST

Speaker: Alfons Crespo (Institute of Automation and Industrial Informatics of the Universitat Politècnica de València, Spain)

Title: Why a hypervisor-based approach is the best alternative for mixed-criticality systems

Short Bio

Alfons Crespo is a member of the Institute of Automation and Industrial Informatics of the Universitat Politecncia de Valencia. The main research area is associated with real-time systems in the topics of scheduling, design, development, execution support and virtualization techniques. He has also collaborated with control theory groups to conjugate planning and control performance. The XtratuM hypervisor is one of the results obtained in the projects that has been transferred to fentISS (UPV spinoff). He has participated in a large number of research projects at European and national level. He has co-authored more than 200 papers in journals and conferences in the field of real-time systems. Teaching activities include courses on operating systems, embedded systems and real-time systems.

Abstract

The increasing computational capacity of cyber-physical systems (CPS) due to more powerful processors and, especially, multi-core systems has caused their implementation in control systems to have a greater impact than initially expected. One of the consequences is the inclusion of a large number of CPS in the development of cars, airplanes, trains, etc. The need to reduce consumption, weight, wiring, etc., in these systems has led to the integration of the multiple functions performed in a system in a few computing platforms. In this line of development, hypervisors play a relevant role in the design, development and certification of the system. Hypervisors allow to integrate in the same computing platform the different functionalities that are performed in dedicated CPS. The aim of this presentation is to show that the use of hypervisors for CPS development presents fundamental advantages in the design, development and certification with respect to more traditional CPS systems.

KEYNOTE 3

Thursday 10th, 15:30 CEST

Speaker: Tucker Taft (Director of Language Research at AdaCore, USA)

Title: A sampling of Ada 2022

Short Bio

S. Tucker Taft is VP and Director of Language Research at AdaCore. His specialties include programming language design, advanced static analysis tools, formal methods, real-time systems, parallel programming, and model-based development. Tucker was lead designer of the Ada 95 programming language, and is a member of the ISO Rapporteur Group that developed Ada 2005 and Ada 2012. Tucker has also been designing and implementing a parallel programming language called "ParaSail," and defining parallel programming extensions for Ada as part of the forthcoming Ada 2022 standard.

Abstract

The forthcoming Ada 2022 revision of the Ada standard includes a number of significant new features, which together make the language more expressive and productive in a multicore context, while enhancing its safety and support for more complete abstractions with formal contracts. This talk will introduce these key new features with a series of examples:

- parallel loops and blocks, coupled with static detection of data races and potential blocking
- iterator syntax for incorporating filters and user-defined iterator procedures
- libraries for atomic operations, including fetch-and-add and compare-and-swap
- aggregates, literals, images, and map-reduce for user-defined types
- libraries for arbitrary precision integer and rational arithmetic
- more expressive contracts using delta aggregates and declare expressions
- the Jorvik profile as the next step up from the Ravenscar profile

TUTORIAL 1

Programming mobile robots with ROS2 and the RCLAda Ada Client Library

Alejandro R. Mosteo, Centro Universitario de la Defensa, Zaragoza, Spain

Monday 7th, 13:00 CEST

The Robot Operating System (ROS/ROS2) is a de facto standard in many fields of robotics research, with increasing presence in the industry. RCLAda is a binding to the ROS2 framework that enables programming for ROS2 in pure Ada with seamless integration into the ROS2 workflow.

During this tutorial, participants will learn how to install ROS2 and RCLAda, the necessary basic information about the ROS2 build system and RCLAda integration, and will program basic examples and simulated mobile robots of the kind used in the DARPA Subterranean Challenge.

Level

Introductory (in regard to robotics), intermediate (in regard to Ada).

Reasons for attending

The Robot Operating System (ROS) is a de facto standard in many fields of robotics research, with increasing presence in the industry. RCLAda is a client library for ROS2 that enables developing robots with the benefit of Ada strengths. In this tutorial, participants will learn how to install ROS2 and RCLAda, the necessary information about the ROS2 build system and RCLAda integration, and will test and program basic examples and simulated mobile robots of the kind used in the last DARPA Subterranean Challenge.

Presenter

Alejandro R. Mosteo is a professor at Centro Universitario de la Defensa, Zaragoza, Spain, since 2011. He received the Ph.D. in 2010 from the Universidad de Zaragoza, Spain. He has been a postgraduate researcher at Laboratoire d'Analyse et d'Architecture des Systèmes (LAAS), Toulouse, France. He is a member of the Robotics, Perception, and Real-Time group at Universidad de Zaragoza. He became a member of the steering committee of the Technical Committee on Multi-Robot Systems of the IEEE Robotics and Automation Society in 2015. His Ada advocacy career dates back to 2006 with his affiliation to the Ada-Spain society for the promotion of the Ada language. Recently, he has joined the editorial board of the quarterly Ada User Journal as News Editor in 2019. In 2020 he has been appointed coordinator of the Ada working group within the Spanish standardization body (UNE). His research pursuits include multi-robot cooperation, decentralized algorithms, and autonomous air vehicles.

TUTORIAL 2

Introduction to the development of safety-critical software

Jean-Pierre Rosen, Adalog, France

Monday 7th, 13:00 CEST

This tutorial presents the fundamental notions that make the development of safety-critical software different from the development of more casual software. It presents the context, the applicable standards, and the techniques used for achieving high reliability. It explains why Ada and Spark are especially suited for writing safety-critical software. Although required for demanding applications, the general principles that are detailed can be applied to, and help improve, all kinds of software development.

Level

Intermediate. Expected audience experience: Casual knowledge of Ada.

Reasons for attending
- Understand the stakes of the development of safety-critical software
- Learn the various rules governing the development of safe software, and understand their motivation.
- Consider the tools that are available to improve quality and safety of software
- Apply some principles to more casual software for higher reliability

Presenter

JP Rosen is a professional teacher, teaching Ada (since 1979, it was preliminary Ada!), methods, and software engineering. He runs Adalog, a company specialized in providing training, consultancy, and services in all areas connected to the Ada language and software engineering. He is chairman of Ada-France.

TUTORIAL 3

Parallel programming with Ada and OpenMP

Sara Royuela (Barcelona Supercomputing Center, Spain), S. Tucker Taft (AdaCore, USA) and Luis Miguel Pinho (Polytechnic Institute of Porto, Portugal)

Monday 7th, 13:00 CEST

OpenMP is one of the most widely used frameworks for the development of parallel programs. OpenMP provides a set of annotations which allows for a compiler (or pre-processing tool) to generate parallel code from sequential code (C, C++ or Fortran), as well as a runtime that manages the concurrency and parallel execution (usually on top of a multithreaded OS).

The forthcoming revision of Ada specifies a lightweight parallel model, through a set of constructs that provide a guide to the compiler, to generate the required code for the parallel execution. This lightweight model maps well to one of the OpenMP approaches, which allows parallel Ada programs to execute on top of OpenMP runtimes, as well as roll-your-own light-weight thread schedulers.

This tutorial will show how to develop Ada parallel programs, using both OpenMP as well as a light-weight thread scheduler.

Level

Intermediate/Advanced

Reasons for attending

The omnipresence of parallel platforms in all areas of computing, from cloud to embedded, requires that software developers take into consideration the potential of parallelism, as well as its pitfalls. In this context, attendees will be provided with a general understanding of parallel programming with both OpenMP and the forthcoming Ada parallel model, with a good insight on the direction Ada has been moving in this important domain.

Presenters

Dr. Sara Royuela is a post-doctoral researcher at Barcelona Supercomputing Center (BSC). She got her PhD in Computers Architecture from the Polytechnic University of Catalonia (UPC) with cum laude distinction in 2018. Sara is specialized in High Performance Computing, and she has great background on Real Time systems. She has a vast experience on compilers and analysis tools for enhancing performance and programmability of parallel programming models. Sara is a passionate and enthusiastic person that loves her work and enjoys sharing it with others.

S. Tucker Taft is VP and Director of Language Research at AdaCore. His specialties include programming language design, advanced static analysis tools, formal methods, real-time systems, parallel programming, and model-based development. Tucker was lead designer of the Ada 95 programming language, and is a member of the ISO Rapporteur Group that developed Ada 2005 and Ada 2012. Tucker has also been designing and implementing a parallel programming language called "ParaSail," and defining parallel programming extensions for Ada as part of the forthcoming Ada 2022 standard.

Luis Miguel Pinho is a Professor at the School of Engineering of the Polytechnic Institute of Porto, leading research activities in, among others, real-time and embedded parallel programming models. Miguel participated in more than 25 R&D projects and published more than 100 papers in international conferences and journals in the area of real-time embedded systems. He was coordinator of the FP7 R&D European Project Parallel SOftware framework for time-CRitical mAny-core sysTEmS, which focused in the development of real-time technology for parallel platforms, with both OpenMP and Ada. Miguel is a member of ISO/IEC JTC1/SC22/WG9, a board member of Ada-Europe and Technical Editor of ACM Ada Letters.

TUTORIAL 4

Timing verification from UML & MARTE design models: techniques & tools

Laurent Rioux (Thales Research and Technology, France), Julio Medina (Universidad de Cantabria, Spain) and Shuai Li (CEA LIST, France)

Monday 7th, 13:00 CEST

The objective of this tutorial is to explain how to apply timing verification from design models at an early stage to verify their timing requirements, avoiding the late discovery of costly timing errors. The tutorial will introduce the tools and techniques used to produce design models that, though being useful for code generation, shall be also able to be trustily subject to a suitable form of timing verification. Depending on the severity of the need for verification the design models will be restricted and furtherly transformed so as to serve as input to either (hard) schedulability analysis, or (soft) simulation techniques. The seminar will address first a panoramic view of the field, then it will describe the concepts, languages, tools, and techniques involved, mainly related to the UML and MARTE standards, and finally show their application by means of a well-known industrial case study from the avionics domain. In addition, pedagogical exercises will be proposed to the attendees to fix concepts and train the usage of the tools.

Level: Intermediate

Reasons for attending

If timing verification is needed in your design flow, this tutorial is for you. Using a practical use case it presents UML/MARTE based tools and techniques, which produce early stage design models useful to architect your application, generate code, and transform it to be trustfully subject to a suitable form of timing verification.

Presenters

Laurent Rioux has a doctorate in computer science on real-time and embedded systems at the University of Orsay (Paris XI). He is a senior expert in model-based software and system engineering for critical systems at Thales Research and Technology (TRT), Critical Embedded Systems Lab. He worked in this research domain more than 15 years. He is also known for his work on the definition and the standardization of a UML profile for real-time embedded systems: MARTE. Today, he is leading a research thematic in aim to handle Non-Functional Properties (NFP) in the Model-Driven Engineering approach to design and certify complex and real-time and embedded systems. In particular, his research activities include identifying new ways to design critical systems with the use of formal techniques to verify performance, energy and security properties of these systems.

Julio Medina is an Associate Professor in the University of Cantabria. He received the Ph.D. in Telecom Engineering (Electronics) in 2005. He has a Master in Real-Time Systems and made a post-doc in the LISE lab of CEA LIST, defining and writing several sections of the MARTE standard. He studied the modelling for schedulability analysis of distributed RT systems with SPT, predecessor of MARTE, and continued this effort in the MARTE Revision Task Force of the OMG as well as in other related standards like SySML and the semantics for fUML-based composite structures and state machines.

Shuai Li is a researcher at the CEA LIST institute in France. He obtained a Ph.D. in computer science on the topic of schedulability analysis of TDMA software radio protocols, while working at THALES. Shuai is a committer on open-source projects such as Eclipse Papyrus UML and Linux Foundation ACUMOS AI. He builds model-driven software engineering tools that include scheduling analysis with MARTE, formal models of computation and communication, service-oriented architecture modelers, and code generators. He currently leads a team of a dozen collaborators to build a SOA platform for extremely resource constrained environments. In his free time, Shuai teaches system and software engineering with UML, SysML, and MARTE, at the French National Institute of Nuclear Sciences and Techniques (INSTN), part of the Paris-Saclay University.

TUTORIAL 5

Programming shared memory computers

Jan Verschelde, University of Illinois at Chicago, USA

Monday 7th, 13:00 CEST

Many multicore processors are capable to speedup computations with a significant magnitude, reducing for example to one hour some computation that would otherwise take an entire day to complete. The Ada programming language provides a high level and effective tool to speedup computations on multicore processors. The design of parallel programs starts with the granularity level of the parallelism with careful attention to memory management. We decide on the size of each job, check the mapping of jobs to threads, and on the location of the input and output data for each job. In the evaluation of parallel programs we tune the work load to reach the desired level of efficiency and throughput.

Level

Intermediate: between novice programmers and expert software developers.
- Participants should know how to run and modify Ada programs.
- Most examples will be mathematical. Some exposure or appreciation of subjects such as calculus and linear algebra will be helpful.
- Basic skills to work with the Terminal on a Linux computer.

Reasons for attending

As all computers are parallel shared memory computers, all good software can therefore also run in parallel. Ada is well suited to write good parallel software.

Presenter

Jan Verschelde obtained a PhD in Computer Science in 1996 at the Katholieke Universiteit Leuven (KUL). After postdoctoral fellowships at the KUL, Michigan State University, and the Mathematical Sciences Research Institute, he became a professor in the department of Mathematics, Statistics and Computer Science at the University of Illinois at Chicago (UIC) in 2000. The focus of his research is on algorithms and software to solve systems of polynomial equations, a problem in computational algebraic geometry. He is the main developer of the software PHCpack. At UIC, he teaches graduate courses on Scientific Software and Introduction to Supercomputing.

CONFERENCE STRUCTURE

In addition to the five tutorials, this year's conference has three core days including:

- *Keynotes*: Three guest speakers will deliver their talks in the central hours of the conference.
- *Technical sessions*: They include papers submitted to the journal track that are heading towards final acceptance and open-access publication, together with industrial, invited and vendor presentations.
- *A Work-in-Progress session*: It contains contributions of evolving and early-stage ideas, or new research directions. They are presented in a special session consisting of a round of very short presentations of the highlights of each contribution, followed by a poster session in the same virtual space where the breaks are held.

The technical sessions are designed with the flipped-conference concept, where the audience can access the pre-recorded presentation materials in advance. The live sessions are devoted to short presentations of the highlights of each contribution, allowing ample time for questions and answers with the presenter. The recorded materials will also be available for some time after their sessions.

COLOR LEGEND
Journal-track presentation
Industrial presentation
Invited presentation
Vendor presentation
Keynote
Work-in-Progress presentation
Breaks and social events

EXHIBITION

From Tuesday to Thursday the conference platform will provide access to virtual booths where participants will be able to find information on the conference exhibitors and chat with them or request meetings. The virtual break lounge where the breaks and social events will take place will also have a space for meeting with the exhibitors.

The exhibitors present at the conference are:

- AdaCore: https://www.adacore.com/
- PTC: http://www.ptc.com/developer-tools
- Ada-Europe: http://www.ada-europe.org/

SOCIAL PROGRAM

When we go to a conference, one of the most important objectives is to talk to people and establish links. We talk about work, mainly during the breaks between the sessions. We also talk informally to know people and establish friendship links.

Another nice part of a conference is to visit a city and maybe learn a little bit about its people, food, history and tourist attractions.

Can we do these things in a virtual conference? Yes. We have prepared social events and planned an interactive space for breaks so that we can.

Access the social events through the Lounge button in the main menu, giving access to a space under the gather.town environment. ☕
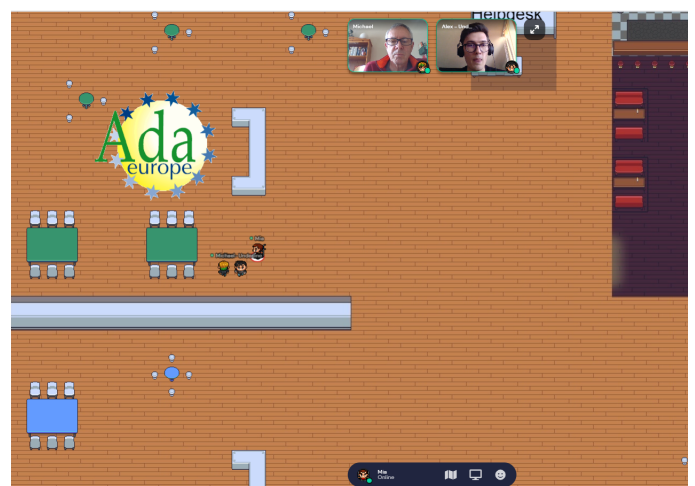
Welcome, Ice-Breaking events, Breaks and Poster Session

You may go to the lounge in the virtual platform and access an open space for interacting with people, visiting the exhibitors and chatting with the authors in the Poster Session.

Tuesday 8th, 17:15: Bring your own regional food

The theme of this social event is regional food. The purpose of the theme is to serve as a motive for people to start talking. From there, the conversation can informally extend to any subject, except work 😳

We ask you to come to the event with a minimal preparation. Maybe just a picture of some regional food that you like, or a recipe, even some actual cake or cooked dish, could be nice.

The meeting space will be divided into tables and, since the conference was originally planned to be in Spain, different tables will represent different cities in this country, where participants from that place will offer explanations about their regional food. Of course, we invite everybody to approach any table and bring their own regional food, with the aim of having cosmopolitan tables where we can share international experiences.

Wednesday 9th, 17:15: Regional festivals and celebrations

The theme of this social event is regional festivals and celebrations. As the day before, the purpose of the theme is to serve as a motive for people to start talking. From there, the conversation can informally extend to any subject, except work 😳

We ask you to come to the event with a minimal preparation. Maybe just a few pictures of a traditional festival or celebration in your area.

The meeting space will be divided into tables and, since the conference was originally planned to be in Spain, the tables will be tagged with the names of different cities or regions in this country, where participants from that place will offer explanations about their traditional festivals or celebrations. Of course, we invite everybody to approach any table and bring information about their own festivals, with the aim of having cosmopolitan tables where we can share international experiences.

Thursday 10th, 17:15: Closing Party

This is our farewell event and we will celebrate what we hope has been a successful conference and say goodbye to our colleagues. As in any party, we will drink and talk. In this case, you will have to bring your preferred drink. However, talking can be as stimulating as in an in-person event. At the end, we will wish you a good year until the celebration of the next conference, planned in Ghent, Belgium.

FURTHER INFORMATION

Participation for the full event, including tutorials, is free for Ada-Europe members and only 60€ for all others. Registration is required for all. The conference web page gives full and up-to-date details on the program, the registration process and the virtual platform: http://www.ada-europe.org/conference2021

CONFERENCE SCHEDULE

	Monday 7th June
12:30 - 13:00	**Welcome Social Event** in gather.town
	5 Parallel Tutorials
13:00 - 15:00	*Programming mobile robots with ROS2 and the RCLAda Ada Client Library* Alejandro R. Mosteo
	Introduction to the development of safety-critical software Jean-Pierre Rosen
	Parallel programming with Ada and OpenMP Sara Royuela, S. Tucker Taft and Luis Miguel Pinho
	Timing verification from UML & MARTE design models: techniques & tools Laurent Rioux, Julio Medina and Shuai Li
	Programming shared memory computers Jan Verschelde
15:00 - 15:30	**Simultaneous break** in gather.town
	5 Parallel Tutorials (continued)
15:30 - 17:30	*Programming mobile robots with ROS2 and the RCLAda Ada Client Library* Alejandro R. Mosteo
	Introduction to the development of safety-critical software Jean-Pierre Rosen
	Parallel programming with Ada and OpenMP Sara Royuela, S. Tucker Taft and Luis Miguel Pinho
	Timing verification from UML & MARTE design models: techniques & tools Laurent Rioux, Julio Medina and Shuai Li
	Programming shared memory computers Jan Verschelde
17:30 - 18:30	**Ice-Breaking Social Event** in gather.town

	Tuesday 8th June
12:30 - 13:15	**Ice-Breaking Social Event** in gather.town
13:15 - 13:30	**Welcome and Opening Session**
	Technical Session 1: *Scheduling and mixed-criticality systems* ***Chair:*** *Miguel Pinho*
13:30 - 13:45	*Contributions to the implementation of global schedulers for mixed-criticality systems* Laurent Pautet, Thomas Robert and Samuel Tardieu
13:45 - 14:00	*Feasibility interval and sustainable scheduling simulation with CRPD on uniprocessor platform* Hai Nam Tran, Frank Singhoff, Stéphane Rubini and Jalil Boukhobza
14:00 - 14:15	*Removing bias from the judgment day: A Ravenscar-based toolbox for quantitative comparison of EDF-to-RM uniprocessor scheduling* D. Perale and T. Vardanega
14:15 - 14:30	*Formally specifying the behaviour of a mixed criticality scheduler* Alan Burns
14:30 - 14:45	**Short break** in gather.town
	Keynote 1 ***Chair:*** *Michael González Harbour*
14:45 - 15:45	*Software reliability in the Big Data era with an industry-minded focus* Ángel Conde
15:45 - 16:15	**Break** in gather.town
	Technical Session 2: *Software modeling* ***Chair:*** *Frank Singhoff*
16:15 - 16:30	*RoBMEX: ROS-based modeling framework for end-users and experts* Matheus Ladeira, Yassine Ouhammou and Emmanuel Grolleau
16:30 - 16:45	*Using Ada for model verification* Tonu Naks, M. Anthony Aiello and S. Tucker Taft
16:45 - 17:00	*User Requirements Notation: Beneficial requirements modelling with goals and processes* Daniel Amyot
17:00 - 17:15	*Vendor presentation* Pierre Dissaux, Ellidiss
17:15 - 18:00	**Social Event** in gather.town *Bring your own regional food*

Wednesday 9th June	
12:30 - 13:00	**Welcome Social Event** in gather.town
	Technical Session 3: *Autonomous systems* ***Chair:** Daniela Cancila*
13:00 - 13:15	*Towards functional safety compliance of matrix-matrix multiplication for machine learning-based autonomous systems.* Javier Fernández Muñoz, Jon Perez, Irune Agirre, Imanol Allende, Jaume Abella and Francisco Cazorla
13:15 - 13:30	*Towards dynamic safety assurance for Industry 4.0* Muhammad Atif Javed, Faiz Ul Muram, Hans Hansson, Sasikumar Punnekkat and Henrik Thane
13:30 - 13:45	*Safe and secure platooning of automated guided vehicles in Industry 4.0* Muhammad Atif Javed, Faiz Ul Muram, Sasikumar Punnekkat and Hans Hansson
13:45 - 14:00	*The great responsibility of next-generation system software: Enabling determinism on high-performance embedded platforms* Marco Solieri
	Work-in-Progress Session ***Chair:** Jorge Real*
14:00 - 14:05	*How windows size and number can influence the schedulability of hierarchically-scheduled time-partitioned distributed real-time systems* Andoni Amurrio, Mario Aldea, J. Javier Gutiérrez and Ekain Azketa
14:05 - 14:10	*Auto-generated coherent data store for concurrent modular embedded systems* James Kimmet
14:10 - 14:15	*Adoption of ACPS in nuclear reactor analysis* Christian Castagna, Daniela Cancila and Antonio Cammi
14:15 - 14:20	*Fuzion – Safety through simplicity* Fridtjof Siebert
14:20 - 14:25	*First steps towards an IEEE 802.1AS clock for EDF scheduling in distributed real-time systems* Hector Perez, Diego García and J. Javier Gutiérrez
14:25 - 14:30	*M2OS for Arduino Uno: Ada tasks and Arduino libraries working together* Mario Aldea Rivas and Héctor Pérez Tijero
14:30 - 14:35	*Queuing ports for mesh based many-core processors* David García Villaescusa, Mario Aldea Rivas and Michael González Harbour
14:35 - 14:40	*Ember: An embedded robotics library in SPARK* Kristoffer Nyborg Gregertsen
14:40 - 15:30	**Break and Work-in-Progress Poster Session** in gather.town

	Wednesday 9th June
	Keynote 2 *Chair: Tullio Vardanega*
15:30 - 16:30	*Why a hypervisor-based approach is the best alternative for mixed-criticality systems* Alfons Crespo
	Technical Session 4: *Ada issues and Ravenscar* *Chair: Laurent Pautet*
16:30 - 16:45	*A correct-by-construction AADL runtime, proof of a safety-critical middleware using SPARK/Ada* Jerome Hugues
16:45 - 17:00	*AdaMM: A precompiler for memory model aware programming on higher language level* Johann Blieberger
17:00 - 17:15	*More Ada in non-Ada systems* Ahlan Marriott
17:15 - 17:30	*PTC Ada and Real-Time Java Solutions* Shawn Fanning and Marie Daub
17:30 - 18:15	**Social Event** in gather.town *Regional festivals and celebrations*

	Thursday 10th June
12:30 - 13:00	**Welcome Social Event** in gather.town
	Technical Session 5: *Validation and verification tools* *Chair: Patricia Balbastre*
13:00 - 13:15	*Static analysis for Ada, C/C++ and Python: different languages, different needs.* Maurizio Martignano
13:15 - 13:30	*ASIS vs. Libadalang: a comparative assessment* Jean-Pierre Rosen
13:30 - 13:45	*Ghost entities and optimization* David Lesens
13:45 - 14:00	*Vendor presentation* Massimo Bombino, Vector

	Thursday 10th June
	Technical Session 6: *Emerging applications with reliability requirements* ***Chair:*** *Juan Antonio de la Puente*
14:00 - 14:15	*A case study for risk assessment in AR-equipped socio-technical systems* Soheila Sheikh Bahaei, Barbara Gallina and Marko Vidovi¢
14:15 - 14:30	*A low-latency and fault-tolerant framework for distributed and deep neural networks over the cloud-to-things continuum* Daniel R. Torres, Cristian Martín, Bartolomé Rubio and Manuel Díaz
14:30 - 14:45	*Reliability-oriented design of on-board satellite boot software against single event effects* Óscar R. Polo, Jonatan Sánchez, Antonio da Silva, Pablo Parra, Agustín Martínez Hellín , Alberto Carrasco and Sebastián Sánchez
14:45 - 15:00	*Building and maintaining critical software investments* Jamie Ayre, AdaCore
15:00 - 15:30	**Break** in gather.town
	Keynote 3 ***Chair:*** *António Casimiro*
15:30 - 16:30	*A sampling of Ada 2022* Tucker Taft
	Technical Session 7 *Safety challenges* ***Chair:*** *Kristoffer Nyborg Gregertsen*
16:30 - 16:45	*Certifiable safety critical multi-core for avionics* Gary Gilliland
16:45 - 17:00	*Brook SC: High-level certification-friendly programming for GPU-powered safety critical systems* Leonidas Kosmidis
17:00 - 17:15	*Machine learning and high criticality applications* Giacomo Gentile
17:15 - 17:30	*Towards Linux based safety systems - A statistical approach for software execution path coverage* Imanol Allende, Nicholas Mc Guire, Jon Perez, Lisandro G. Monsalve and Roman Obermaisser
17:30 - 17:45	**Short Break** in gather.town
17:45 - 18:00	**Best Presentation Award and Closing Session** in gather.town
18:00 - 18:30	**Closing Party** in gather.town

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