

Nuremberg, Germany February 27 – March 1, 2018



CONFERENCE PROGRAM

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Becia Recsing CEDA



embedded world Conference 2018 – Embedded Goes Autonomous

It is embedded systems that make the whole Internet of Things and Industry 4.0, in short, digitization, possible in the first place. And technical development continues to move at a faster and faster pace. It is therefore all the more important for hardware and software developers to exchange their experiences with each other, to discuss potential solutions and to continue to develop their skills in the search for efficient solutions.

With a program of high-quality and solution-oriented presentations, the embedded world Conference 2018 aims to once more contribute to the success of an industry that has now become an essential part of the technological future and, as such, a basis for our continued economic success.

The embedded world Conference 2018 is made up of 7 subject areas, which are clearly structured in the program and presented in different colors. These are: Embedded OS, Security & Safety, Hardware Engineering, Software and Systems Engineering, IoT, Embedded Vision and Autonomous Systems. The solution-oriented presentations of each session build upon one another and examine questions from different perspectives. Discussion and an active exchange of ideas with the speakers as well as among conference participants is encouraged. The half-hour presentations of the sessions will be complemented by Classes, which provide comprehensive basic information on selected topics in the form of condensed training courses.

It has been decided not to describe all 226 presentations in detail here. You will find them fully explained on the following pages of this booklet. Instead, members of the Steering Board refer below to one of their favorites which will take place in that part of the program for which they are responsible.

Prof. Dr.-Ing. Matthias Sturm (Security & Safety)

I am especially looking forward to the "Cryptography Engineering for Embedded Devices" Class led by Dr. Ing. Strenzke on the first day of the embedded world Conference, which provides an understandable and clearly structured introduction to the very important subject of Cryptography.

Prof. Dr.-Ing. Axel Sikora (IoT, Connectivity, Embedded Vision)

The Internet of Things and its underlying connectivity are integral parts of many new applications for embedded systems which are creating many opportunities but also risks. This will be highlighted in a total of eight sessions ranging from new LPWA networks to payment processes for IoT applications.

The exciting subject of Embedded Vision is my insider tip because it is enabling the establishment of a whole new industry with new technologies and applications. Here we would like to thank the VDMA and the Embedded Vision Alliance for their excellent cooperation.

Dr.-Ing. Klaus Grimm (Software Engineering)

In more and more embedded projects the programming language C++ is replacing C. Better object-oriented structuring and encapsulation are just two of the benefits, but at the same time, the significantly higher complexity also entails risks. I am therefore especially looking forward



Prof. Dr. Matthias Sturm, Chairman of embedded world Conference steering board

to the new findings on embedded C++, which will be presented in the session "Software Engineering 1 – Languages and Standards.

Prof. Dr.-Ing. Peter Fromm (Systems Engineering)

The big challenges in the development of reliable complex systems are probably nowhere more evident than in the areas of aerospace technology and in the current trends towards autonomous driving in the automotive industry. How to master such complexity while at the same time remaining efficient and agile in development? Bruce Douglass discusses this with field reports and innovative methodical approaches in his exciting classes on Systems Engineering and Agile Methods as well as in the session "Software Engineering II - Software & System Development Process"

Dr.-Ing. Bernd Hense (Hardware Engineering)

In addition to classic, but nevertheless exciting, topics such as minimizing energy consumption and increasing computing power, for example by parallelization in multicore systems or FPGA instead of programming, the RISC-V Initiative is something that could possibly become the "Linux of hardware". Will it open doors for deployment on a wider scale? I look forward to the RISC-V workshop on the first day.

Dr.-Ing. Bernd Hense (Autonomous Systems)

In the future we will increasingly be confronted by technical systems that don't just act in a programmatic way, e.g. systems that are calculated in a completely predictable context, but rather ones that behave situationally. This means that machines will be able to make decisions in not previously simulated situations. How close are we to this? How will these systems be implemented? Experts will deliver interesting insights in the sessions "Autonomous Systems".

Joachim Kroll (Embedded OS)

The practical application of Virtualization has arrived in the embedded industry: With this technology, the enormous computing potential of modern multi-core processors can be released, and on the other hand, numerous safety-critical functions can now be integrated into one device. But how much performance does a Hypervisor cost? Cesare Garlati from the prpl Foundation and Marcus Levy, EEMBC, will provide answers to this question during their presentation "Benchmarking Embedded Hypervisors Performance - the Facts".

The steering board of the embedded world Conference 2018 wishes all conference participants a lively exchange of views about new ideas and solutions. Become part of the pulsating conference atmosphere, in order to be able to better and more easily master the immense challenges that lie ahead.

Prof. Dr. Matthias Sturm Chairman of embedded world Conference steering board

	INTERNET	OF THINGS	EMBEDDED VISION	AUTONOMOUS SYSTEMS	SECURITY	& SAFETY
DAY 1: morning	Session 08: Connectivity I LPWA & NB-IoT	Session 03: IoT I IoT OS & Platforms	Session 07 I: Embedded Vision I Architecture & Development I	Session 10 I: Autonomous Systems I Architectures & Applications	Session 01 I: Functional Safety I	Class 04: Cryptography Basics
DAY 1: afternoon	Session 09: Connectivity II Bluetooth & Energy- Harvesting	Session 04: IoT II IoT Solutions	Session 07 II: Embedded Vision II Architecture & Development II	Session 10 II: Autonomous Systems II Architectures & Applications	Session 01 II: Functional Safety II	Session 02: Hacking
DAY 2: morning	Session 20: Connectivity III 80215.4, 6Lo & Mesh I	Session 15: IoT III Payment		Session 22: Autonomous Systems III Sensors & Sensor Fusion	Session 11 I: Securing Embedded Devices I	Class 06: Securing V2X Communication in Connected Vehicles; powered by Escrypt
DAY 2: afternoon	Session 21: Connectivity IV 80215.4, 6Lo & Mesh II		Session 25: Vision III Cameras, Modules & Solutions	Session 23: Autonomous Systems IV Machine Learning	Session 11 II: Securing Embedded Devices II	
DAY 3: morning	Session 35 I: Connectivity V Wired Connectivity I		Session 29: Embedded GUI & Augmented Reality	Session 36: Autonomous Systems V Test & Qualification		Session 26 I: Cryptography I
DAY 3: afternoon	Session 35 II: Connectivity VI Wired Connectivity II					Session 26 II: Cryptography II

KEYNOTE-SPEAKERS



Mark Papermaster, AMD Conference Keynote: Evolving Embedded Systems in a Self-directed World February 27th, 2018, 13:30

Mark Papermaster is chief technology officer and senior vice president of Technology and Engineering at AMD, responsible for corporate technical direction, product development including system-on-chip (SOC) methodology, microprocessor design, I/O and memory, and advanced research. He also oversees Information Technology to deliver AMD's compute infrastructure and services.



Andrea Martin, IBM Keynote: Industry Solutions with the Internet of Things February 28th, 2018, 09:30

Andrea Martin is Chief Technology Officer (CTO) for IBM in Germany, Austria and Switzerland (DACH). Her goal is – together with a highly motivated and skilled technical community – to develop innovative solutions addressing her clients' business challenges. In addition she is responsible for shaping and adopting the IBM technical strategy for the DACH market and represent IBM's technical thought leadership externally.

OVERVIEW

	EMBEDDED OS		HARDWARE ENGINEERING		SOFTWAF	E & SYSTEMS ENG	INEERING
Class 02: Introduction to Embedded Linux / Theory and Practice Crash Course			Class 01: Risc-V Class		Session 05: Software Engineering I Languages & Standards	Class 03: From Idea to Production ECU Code in One Day, powered by ETAS	Class 05: The Bruce Douglass Class – Modeling
					Session 06: Software Engineering II Software & System Development Process		
Session 13: RTOS I Basics	Class 09: Linux for Routers: Setup and Hardening		Session 24: Hardware Periphery & Interfaces		Session 17: Software Engineering III Software Quality I	Class 08: The Greg Davis C/C++ Class	Class 07: The Bruce Douglass Class – Design Patterns and Architectures
Session 14: RTOS II Automotive	Session 19: Embedded Linux		Session 12: FPGA based Hardware Solutions	Session 16: Power Supply Design and Management	Session 18: Software Engineering IV Software Quality II		
Class 10: The Nicholas McGuire Class – GNU / Linux	Class 12: Embedded Android Workshop		Session 33: Hardware: The Right Choice		Session 31: Software Engineering V Software Design & Modeling	Session 27: MISRA C/C++	Class 11: The Bruce Douglass Class – Agile Development Methods
		Session 28: Virtualization & Separation	Session 30: Multicore Systems	Class 13: Ultra-Low-Power	Session 32: Software Engineering VI Software Testing	Session 34: Software Engineering VII Software Debugging	

STEERING BOARD



Prof. Dr. Peter Fromm University of Applied Sciences Darmstadt

Dr. Bernd Hense





Dr. Klaus Grimm

Frank Riemenschneider

DESIGN&ELEKTRONIK





Joachim Kroll Elektronik

Prof. Dr. Axel Sikora Co-Chair University of Applied Sciences Offenburg, Hahn-Schickard



Prof. Dr. Matthias Sturm **Conference Chair** Leipzig University of Applied Sciences

TUESDAY, FEBRUARY 27, 2018

	Session 01 I: Functional Safety I		Session 03: IoT I / IoT OS & Platforms
09:30-10:00	Top Misunderstandings About Functional Safety Christian Dirmeier, TÜV SÜD Rail		What is an IoT OS? Øivind Loe, Silicon Labs
10:00-10:30	Verification of Memory Interferences in Automotive Software: A Practical Approach Dr. Ludovic Pintard, VALEO		Software Architectures for IoT Prof. Robert Oshana, NXP Semiconductors
10:30-11:00	Functional Safety in Al-controlled Vehicles: If Not ISO 26262, Then What? Joe Dailey, Mentor, A Siemens Business		Implementation of a Web Development Platform for Embedded System Designers Carlos Pazos, National Instruments
11:00-11:30		Coffee Break	
11:30-12:00	Designing Embedded Systems for Autonomous Driving with Functional Safety and Reliability David Lopez, NXP Semiconductors		Make Your Industrial Device Smart Using a SaaS IoT Platform Stefan Vaillant, Cumulocity
12:00-12:30	Safety Architectures on Multicore Processors – Mastering the Time Domain Thomas Barth, Hochschule Darmstadt		How Do You Select Which IoT Protocol to Use? Christian Legare, Silicon Labs
12:30-13:30		Lunch Break	
13:30-14:30	KEYNOTE 13:30 Ev	Conference Keynote: olving Embedded Systems in a Self-directed We Mark Papermaster, AMD	orld
	Session 01 II: Functional Safety II	Session 02: Hacking	Session 04: IoT II / IoT Solutions
14:30-15:00	Open Source Software in Certified Medical Devices: Just How Safe is It? Kathy Tufto, Mentor, A Siemens Business	Security in Manufacturing: Closing the Backdoor in IoT Products Josh Norem, Silicon Labs	Predictive Maintenance Using a Fully Compound Material Integrated Measuring System Sven Grunwald, TU-Dresden
15:00-15:30	Developing Medical Device Software to be Compliant With IEC 62304 Consolidated Version Edition 1.1 Mark Pitchford, LDRA	Reverse Engineering the TP-Link HS-110 Wi-Fi Smart Plug Lubomir Stroetmann, Prof. Dr. Hartmut Pohl, softScheck	IoT Integration in Machines and Production Lines Made Easy Robert Schachner, RST Industrie Automation
15:30-16:00		Coffee Break	
16:00-16:30	Certifying Linux – Lessons Learned in 3 Years of SIL2LinuxMP Andreas Platschek, OpenTech EDV Research	Rowhammer – a Behind the Scene Report to Assess the Severity of This Attack Vector Norbert Wiedermann, Fraunhofer AISEC	Dotdot Unifies Legacy Device Networks Mark Tekippe, Silicon Labs
16:30-17:00	A Multi-Platform Modern C++ Framework for Safety-Critical Embedded Software Daniel Tuchscherer, Hochschule Heilbronn	You've Been Hacked! Now What? Haydn Povey, Secure Thingz	Localizing Analytics for Speed, Reliability and Reduced Power Consumption John Milios, Sendyne
17:00-17:30	Challenges in Virtualizing Safety-Critical Cyber- Physical Systems	Hack-Proofing Your C/C++ Code Greg Davis, Green Hills Software	Build an Industrial-Strength Device-to-Cloud IoT Application in 30 Minutes – No Smoke and

TUESDAY, FEBRUARY 27, 2018

Session 05: Software Engineering I Languages & Standards	Session 07 I: Embedded Vision I Architecture & Development I	Session 08: Connectivity I LPWA & NB-IoT	Session 10 I: Autonomous Systems I Architectures & Applications
C – The Language of Embedded Colin Walls, Mentor, A Siemens Business	Session Keynote Jeff Bier, Embedded Vision Alliance	Selecting Cellular LPWAN Technology for the IoT Brent Nelson, Digi International	Implementing Artificial Neural Networks, Unleashing New Possibilities of Edge Intelligence Hussein Osman, Lattice Semiconductor
Agile Software Development and ISO26262 Irwin Fletcher, OpenSynergy	Embedded Vision Solutions – State of the Art, Options and Applications Jan-Erik Schmitt, Vision Components	Sigfox – Connecting the World Alexander Lehmann, Sigfox Germany	olOne: Artificial Intelligence on Chip Dr. Marco Calabrese, Holsys
AUTOSAR – Development of a New C++ Standard Prof. Dr. Frank van den Beuken, PRQA	Shifting Advanced Image Processing from Embedded Boards to Future Camera Modules – a Paradigm-Change for Embedded Designers? Paul Maria Zalewski, Allied Vision Technologies	Why LTE Cat M1 and LTE Cat NB1 Make Perfect Sense for Digitization and Smart Predictive Infrastructure Ludger Boeggering, u-blox	Effective Embedded AI with NeuroMem Technology: From IP to Applications Dr. Stephane Gervais, General Vision
	Coffee	Break	
Automotive Software Solutions for Complex Safety-Certifiable Designs of the Future Daniel Bernal, ARM	Image Compression with a System-on-a- Chip Joerg Mohr, Solectrix	Enabling Firmware Updates Over LPWANs Jan Jongboom, ARM	Embedded Goes Autonomous – RTOS Considerations Robert Pickles, SYSGO
Achieving ISO 26262 Compliance to Ensure Safety AND Security Mark Richardson, LDRA	CPUs or FPGAs for Image Processing: What's the Best Tool for the Job? Brandon Treece, National Instruments	Real-Time Position Tracking and Finish Detection with LoRa Dr. Juan-Mario Gruber, Züricher Hochschule für Angewandte Wissenschaften (ZHAW)	A New Scalable Architecture to Accelerate Deep Convolutional Neural Networks for Low Power IoT Applications Dr. Giuseppe Desoli, STMicroelectronics

Lunch Break

Conference Keynote:

Evolving Embedded Systems in a Self-directed World

Mark Papermaster, AMD

Session 06: Software Engineering II Software & System Development Process	Session 07 II: Embedded Vision II Architecture & Development II	Session 09: Connectivity II Bluetooth & Energy-Harvesting	Session 10 II: Autonomous Systems II Architectures & Applications
A Lean Process for Ariane 6 Flight Software Development Philippe Gast, arianegroup	Vision Applications Continuum from High-Performance and Desktop Toward Embedded Computing Made Easy by an Efficient OpenCL Runtime Environment Bogdan Ditu, NXP Semiconductors	IoT Ready Self-Powered Sensor Platform Using Ultra Low Power Wireless Wakeup Technology Dr. Tolgay Ungan, endiio	Certification Aspects of a Connected Vehicle Ritu Sethi, Intel
The Infinite Software Development Lifecycle of Connected Systems Mark Richardson, LDRA	Accelerating Neural Networks for Embedded Vision via FPGAs Glenn Steiner, Xilinx	Battery Free Wireless Sensor Technology Greg Rice, ON Semiconductor	Innovations in Perception and Control for Autonomous Vehicle Operation David Hofert, Perrone Robotics; Dan Isaacs, Xilinx
	Coffee	e Break	
Automating the Maintenance of Bi- Directional Requirements Traceability Mark Pitchford, LDRA	Embedded Vision – Efficient Development of Applications Using Professional Vision Software Christoph Wagner, MVTec Software	Understanding Advanced Bluetooth Angle Estimation Techniques for Real- Time Locationing Sauli Lehtimaki, Silicon Labs	Radar Sensors for Autonomous Driving: From Motion Measurement to 3-D Imaging Snehaprabha Narnakaje, Karthik Ramasubramanian, Texas Instruments
Change Based Requirements Management Bernd Röser, agosense	Software Development Strategies for Reusing Code in New Embedded Vision Applications Frank Karstens, Basler	Bluetooth Mesh Networking – an Introduction for Developers Martin Woolley, Bluetooth SIG	A Study Of Synthetic Aperture Radar for Automotive Embedded Systems Florian Fembacher, Infineon Technologies
Certification Testing Process with Full Traceability Michael Wittner, Razorcat Development	Accelerating the Development of Intelligent, Vision-Enabled Devices at the Edge Dirk Seidel. Lattice Semiconductor	Bluetooth Low Energy Solar Beacon as IoT Enabler Cecilia Hoeffler, RWTH Aachen University	Visual Modeling of Self-Adaptive Systems Dr. Juha-Pekka Tolvanen, MetaCase

Want more? See page 12/13 for additional classes!

WEDNESDAY, FEBRUARY 28, 2018

09:30-10:00	KEYNOTE 09:30	Key Industry Solutions wit Andrea I	rnote: In the Internet of Things Martin, IBM	
10:00-10:30		Coffe	ee Break	
	Session 11 I: Securing Embedded Devices I	Session 24: Hardware Periphery & Interfaces		Session 13: RTOS I Basics
10:30-11:00	IoT-Security and Product Piracy: Smart Key Management Versus Secure Hardware Dr. Christian Zenger, Ruhr University Bochum	FOC-SoC – Field-Oriented Control Servo on Chip Dr. Lars Larsson, TRINAMIC Motion Control		Getting Started with Real-Time Operating Systems Jacob Beningo, Beningo Embedded Group
11:00-11:30	Protect Your System by Isolating Your Keys from Software: The Importance of Hardware-based Security Xavier Bignalet, Microchip Technology	High Speed Interfaces in Cost Optimized FPGAs Ted Marena, Microsemi		
11:30-12:00	The IoT Requires Upgradable Security Dr. Lars Lydersen, Silicon Labs	Lucky Seven: Taking Advantage of COM Express Type 7 Ansgar Hein, iesy		ARM Cortex-M and RTOSs Are Meant for Each Other Jean Labrosse, Silicon Labs
12:00-12:30	Bringing TrustZone from Mobile to IoT Requires a New Approach Robert Coombs, ARM	PCB Design Problems and Solutions for Embedded Supercomputing Dr. Andreas Doering, IBM Zurich Research Laboratory		Automating Power Management in MCU Operating Systems Nick Lethaby, Texas Instruments
12:30-13:30		Lunc	h Break	
	Session 11 II: Securing Embedded Devices II	Session 12: FPGA based Hardware Solutions	Session 16: Power Supply Design and Management	Session 14: RTOS II Automotive
13:30-14:00	Safety and Security from the Inside – a SoC's Perspective Prof. Dr. Antonio Salazar, Synopsys	From Matlab To FPGA in Manageable Steps, a True Story in Double Precision Mike Looijmans, Topic Products	Powering the Processor – Basics of Power Converters George Slama, Wurth Electronics Midcom	The State of Embedded Open Source Software in 2018 Rod Cope, Rogue Wave Software
14:00-14:30	Incorporating Security in the Safety Case Chris Taylor, BlackBerry QNX	Partitioning of Computationally Intensive Tasks Between FPGA and CPUs Tobias Welti, ZHAW Institute of Embedded Systems		The Open Road to Autonomous Driving Dan Cauchy, The Linux Foundation
14:30-15:00	Embedding Security in the Autonomous Vehicle William Boldt, BlackBerry Technology Solutions	Analyzing the Generation and Optimization of an FPGA Accelerator with High-Level Synthesis Stefan Wiehler, Missing Link Electronics		Developing Safety Autonomous Driving Solutions Based on the Adaptive AUTOSAR Standard Leo Hendrawan, Andrei Kholoduyi; Wind River System
15:00-15:30	Automotive Domain Consolidation – Security Challenges Persist Andrew Patterson, Mentor, A Siemens Business	Test Automation for Reengineered Modules Using Test Description Language and FPGA Dr. Tobias Krawutschke, TH Köln		Could Virtualization be the Key to Reducing Complexity Within the Automotive E/E Architecture? Nicholas Ayres, DeMontfort University
15:30-16:00		Coffe	ee Break	
16:00-16:30	Secure Boot Essentials: Prevent Edge Node Attacks by Securing Your Firmware Donnie Garcia, NXP Semiconductors	Accelerating Neural Networks for Autonomous Systems via FPGAs Glenn Steiner, Xilinx	Achieving Ultra Low Power in Embedded Systems Herman Roebbers, Altran	Virtualization for Microcontroller Hardware Dr. Ralph Sasse, OpenSynergy
16:30-17:00	Efficient Solution for Secure Firmware Install and Upgrade of Embedded Applications Christophe Mani, STMicroelectronics	Hardware Deceleration: The Challenges of Speeding Up Software Kris Chaplin, Intel	Understanding SoC Power Management and Performance Determinism Ben Boehman, AMD	Virtual Platform Environment for the Bring Up and Test of a Secure Many-Core RTOS Larry Lapides, Imperas Software
17:00-17:30	Security Filters for IoT Domain Isolation Dr. Dominique Bolignano, Prove & Run		Understanding Where the Power Goes in an Energy Efficient Systems Rod Watt, ARM	Comparing Automotive Secure Gateway Design Approaches Dr. Carmelo Loiacono, Green Hills Software

WEDNESDAY, FEBRUARY 28, 2018

Keynote:

Industry Solutions with the Internet of Things

Andrea Martin, IBM

		Coffee Break		
	Session 17: Software Engineering III - Software Quality I	Session 15: IoT III Payment	Session 20: Connectivity III / 80215.4, 6Lo & Mesh I	Session 22: Autonomous Systems III Sensors & Sensor Fusion
	Internet of Threats? – A Code Quality Management Strategy Prof. Dr. Frank van den Beuken, PRQA	State of the Art of Blockchain Payments in the Machine Economy Xavier Lavayssière, ECAN	Connecting Sub-1 GHz Low-Power IoT Nodes to the Internet Using 802.15.4 Nick Lethaby, Texas Instruments	Embedded Algorithms for Motion Detection and Processing Dr. Marco Castellano, STMicroelectronics
	Combining Static and Dynamic Analysis Dr. Paul Anderson, GrammaTech	Smart Contracts for Industry 4.0 Using Blockchain Christoph Reich, Furtwangen University	How to Massively Scale Wireless Computing, Command and Control Across Your Network Scott Allen, FreeWave Technologies	Trends in Automotive Radar: NCAP and Autonomous Dr. Thomas Wilson, NXP Semiconductors
	Finding Safety Defects and Security Vulnerabilities by Static Analysis Dr. Daniel Kästner, AbsInt Angewandte Informatik	How Connected Cars are Driving Connected Payments Jim Carroll, Mobica	emb::6 – An Open-Source IoT stack for Multiple Communication Protocols Nidhal Mars, Hochschule Offenburg	Parallel Architectures for Object-Based Sensor Fusion on Automotive Embedded Systems Florian Fembacher, Infineon Technologies
	C++17: Analysis and Risk Mitigation of Security Vulnerabilities Walter Capitani, Rogue Wave Software	ATM Protection Using Embedded Machine Learning Solutions Prof. Antonio Rizzo, Dr. Francesco Montefoschi; University of Siena	Unraveling Mesh Networking Options – Benchmarking Zigbee, Thread and Bluetooth Mesh Protocol Stacks Tom Pannell, Silicon Labs	Centralized Raw-Data Sensor Fusion: A new Approach for a Safer Autonomous Vehicle Future Amin Kashi, Mentor, A Siemens Business
		Lunch Break		
Session 19: Embedded Linux	Session 18: Software Engineering IV - Software Quality II	Session 25: Vision III / Cameras, Modules & Solutions	Session 21: Connectivity IV / 80215.4, 6Lo & Mesh II	Session 23: Autonomous Systems IV Machine Learning
A Pragmatic Guide to Boot-Time Optimization Chris Simmonds, 2net	How Can You Sustain High Performance with Functional Safety Features? Jon Taylor, ARM	Camera Standards for Embedded Vision Systems Dr. Fritz Dierks, Basler	Management Technologies for Multi-Radio Co-Existence Brian Bedrosian, Cypress Semiconductor	Surviving the Flood of Data – Making Sense of IoT, Machine Learning, and Anomaly Detection Robert Bates, Mentor, A Siemens Business
	Balancing Functional Safety with Performance Intensive Systems Marcus Nissemark, Green Hills Software	High-Resolution Multi-Camera Tool to Develop an Autonomous Vision System Solution Michaël Uyttersprot, Avnet	How to Realize an IoT Project Effectively Simon Chudoba, IQRF Alliance	Machine Learning for Autonomous System Operation of Visual Inspection Manufacturing Equipment Javier Diaz, Plethora IIoT
Linux Power Management: Are You Doing it Right? Chris Simmonds, 2net	Obtaining Worst-Case Execution Time Bounds on Modern Microprocessors Dr. Daniel Kästner, AbsInt Angewandte Informatik	Embedded Vision Systems Used as Sensors in IoT Applications Marcus-Michael Müller, Basler	Supporting Multiple Protocols (BLE/802.15.4) Concurrently in a Single Chip Antonio Concio, NXP Semiconductors	DeepAPI – Bringing Deep Learning at the Edge Device With a Use Case in Food Recognition Dr. Vassilis Tsagaris, Irida Labs
	Missing Relationship Between Soft- ware FTAs and System FTA on Multi- Core Platforms – Identification and Resolving Hossam Abolfotuh, elad	Closing the Loop in Additive Manufacturing – An Embedded Solution for Real-Time Melt Pool Monitoring Dr. Christos Theoharatos, Irida Labs	Modular Wireless Sensor Communi- cation as Basis for a Non-Disruptive Evaluation Kit for Industrie 4.0 Dr. Christoph Rathfelder, Hahn-Schickard	Python-Based Framework for Analytics/Neural Networks in Industrial IoT Dr. Giulio Corradi, Dan Isaacs, Xilinx
		Coffee Break		
Yocto Project Linux as a Platform for Embedded Systems Design Alex Gonzalez, Digi International	Stopping Buffer Overflows Mark Hermeling, GrammaTech	Addressing the Challenges of Creating Infra-Red Vision Systems for the IIOT and IOT Adam Taylor, Adiuvo Engineering & Training	Automatic Tracking of Li-Fi Links for Wireless Industrial Ethernet René Kirrbach, Fraunhofer IPMS	Deep Learning Requirements for Autonomous Vehicles Gordon Cooper, Synopsys
Boot Time: Benefits & Drawbacks of Linux Sleep and Hibernate Thom Denholm, Datalight	X-Ray Your Software Supply Chain. Automate Your Security Gates Prof. Dr. Ralf Huuck, Synopsys	Embedded Velocity Measurement Using a Sensor Based on a Fly Eye Prof. Hans Dermot Doran, Zürich University of Applied Sciences	Design of On-Chip RFID Transponder Antennas Dr. Andreas Heinig, Fraunhofer IPMS	Old Law and New Technology – How Can Legislation Keep Pace? Susanne Meiners, NewTech
Taming Tigers: Building Open Source Ecosystems Dr. Philip DesAutels, The Linux Foundation	My Processor is Inside of a FPGA – What Do I Do Now? Glenn Steiner, Xilinx	Hard- and Software for Embedded Machine Vision Martin Kersting, Stemmer Imaging	Demystifying Why Your Embedded ADC Does Not Perform To The Datasheet And What You Can Do To Improve Performance Dr. Christy She, Texas Instruments	

Want more? See page 12/13 for additional classes!

THURSDAY, MARCH 1, 2018

	Session 26 I: Cryptography I	Session 29: Embedded GUI & Augmented Reality	Session 27: MISRA C/C++
09:30-10:00	A Bottom-Up Approach for IoT Security Andrey Nikishin, Kaspersky Lab	Building Modern Industrial HMIs with Open Standards and Open-Source Software Frank Meerkötter, basysKom	Practical Use of MISRA C and C++ Greg Davis, Green Hills Software
10:00-10:30	Securing Tomorrow's IoT Devices: The New Potential for Integrating Sophisticated Security Functions Into the Microcontroller Jack Ogawa, Cypress Semiconductor	User Experience as an Industry 4.0 Innovation Driver David C. Thömmes, Shapefield	
10:30-11:00	Delivering High-Mix, High-Volume Secure Manufacturing in the Distribution Channel Anthony Ambrose, Data I/O	Real-Time Holographic Solutions for True 3D Display Dr. Darran Milne, VividQ	
11:00-11:30		Coffee Break	
11:30-12:00	Providing Cryptography for Your System Simon Butcher, ARM	Integrating Capacitive Touch Technology Into Electronic Access Control Products Walter Schnoor, Texas Instruments	Write Safe AND Secure Application Code with MISRA C:2012 Mark Richardson, LDRA
12:00-12:30	How Next-Generation Security ICs Deliver a Stronger Level of Protection Scott Jones, Maxim Integrated	Accelerating 3D Graphics Performance with EGL Image on Zynq UltraScale+ MPSoC Alok Gupta, Xilinx	Writing Reliable Code with MISRA C Colin Walls, Mentor, A Siemens Business
12:30-13:30		Lunch Break	
	Session 26 II: Cryptography II	Session 28: Virtualization & Separation	Session 32: Software Engineering VI Software Testing
13:30-14:00	Timon, Rex and Tux: How TPMs and On-Chip Security Modules Improve Trust and Security in GNU/Linux Michael Röder, Avnet EMG	Embedded Hypervisors: Hype or Reality? Cesare Garlati, prpl Foundation; Jack Greenbaum, Green Hills Software	How to Efficiently Combine Test Methods for an Automated ISO 26262 Compliant Software Unit/Integration Test Markus Gros, BTC Embedded Systems
14:00-14:30	TPM 2.0 for Enhanced Security in Software Updates of Industrial Systems Dr. Florian Schreiner, Infineon Technologies	Digging Into Embedded Virtualized Systems – Overcoming the Barriers to Debugging Hardware and Software Khaled Jmal, Lauterbach	Continuous Integration and Test from Module Level to Virtual System Level Johannes Foufas, VOLVO Car
14:30-15:00	Secure Update of Artificial Intelligence Applications Used in an Autonomous Driving Alberto Troia, Dr. Antonino Mondello; Micron Technology	Benchmarking Embedded Hypervisors Performance – the Facts Cesare Garlati, prpl Foundation Markus Levy, EEMBC	Self-testing in Embedded Systems Colin Walls, Mentor, A Siemens Business
15:00-15:30		Coffee Break	
15:30-16:00	Physically Unclonable Functions to the Rescue: A New Way to Establish Trust in Silicon Cesare Garlati, prpl Foundation Geert-Jan Schrijen, Intrinsic ID	Autonomous Driving Needs Safety & Security Dr. Ciwan Gouma, SYSGO	Efficient Software Variants Testing Michael Wittner, Razorcat Development
16:00-16:30	How to Incorporate Low-resource Cryptography Into a Highly Constrained Real-world Product Derek Atkins, SecureRF Corporation	Creating Software Separation for Mixed Criticality Systems Andrew Caples, Mentor, A Siemens Business	The Impact of Test Case Quality Frank Büchner, Hitex

THURSDAY, MARCH 1, 2018

Session 31: Software Engineering V Software Design & Modeling	Session 33: Hardware: The Right Choice	Session 35 I: Connectivity V / Wired Connectivity I	Session 36: Autonomous Systems V Test & Qualification
Transitioning Real-Time Software Design from C to C++ Jacob Beningo, Beningo Embedded Group	RISC-V – the Software and Hardware Aspects of an Open Source ISA Prof. Robert Oshana, NXP Semiconductors	Time Sensitive Networks for Industry 4.0 Thomas Leyrer, Texas Instruments	High Integrity Software is Fundamental to Autonomous Embedded Systems Jeffrey Fortin, Vector Software
Dynamic Memory Allocation & Fragmentation in C & C++ Colin Walls, Mentor, A Siemens Business	When is a Custom SoC the Right Choice for IoT Products? Michele Riga, ARM	TSN – Future Industrial Ethernet Standard or AVB 2.0? Torsten Rothe, Avnet EMG	Safety & Security Testing of Cooperative Automotive Systems Dominique Seydel, Fraunhofer ESK
Optimized – Cost Effective Implementation of Widely-Used Safety Mechanisms in Heterogeneous Software Architectures Esam Mamdouh, eJad	The Business Case for Affordable Custom Silicon Edel Griffith, S3 Semiconductors	Demystifying Time Aware Traffic Shaping Technologies for TSN: A Case Study for Linux Driver Enabling Boon Leong Ong, Intel	Sensor Simulation – Validation of Safety-related Sensors with Real Time Capability Kristian Trenkel, iSyst Intelligente Systeme
	ee Break		
Design Security Into Your Code. Don't Just Hope to Remove Insecurity Mark Pitchford, LDRA	Demand Based and Software Guided Selection of Microcontrollers Thomas Stolze, Hochschule Harz	TSN and OPC UA for Industrial Automation – Challenges in Getting Fieldbus-like Performance and Scalability within Convergent Networks Torben Henke, Stuttgart University	Effective Power Interruption Testing – How Best to Fail Thom Denholm, Datalight
Partitioning of Algorithms for Distributed Computation Andreas Rechberger, Graz University of Technology		Beyond the Capabilities of Wireshark: Ef- fective and Efficient Generation of Mostly- Valid Messages for Bad Case Testing of Communication Protocol Implementations Andreas Walz, Offenburg University of Applied Sciences	Using Google Test for Safety Sensitive Software Development Miroslaw Zielinski, Parasoft
	Lunc	:h Break	
Session 34: Software Engingeering VII Software Debugging	Session 30: Multicore Systems	Session 35 II: Connectivity VI / Wired Connectivity II	
Tips and Tricks for Debugging Greg Davis, Green Hills Software	OpenAMP: Making Full Use of Heterogeneous Multicore ARM Devices Andrew Caples, Mentor, A Siemens Business	System and Device Design Recommendations for CAN FD Networks Holger Zeltwanger, CAN in Automation (CiA)	at 05.12.2017)
	Tackling the Emerging Software and System Challenges in the New Multicore Automotive Era Maximilian Odendahl, Silexica	CANopen FD – Embedded Network as Base for IoT Applications Reiner Zitzmann, CAN in Automation (CiA)	is subject to change (as
Jump Starting Code Development to Minimize Software Bugs Jacob Beningo, Beningo Embedded Group	Multicore Approach on AUTOSAR Systems, Performance Impact Analysis Dr. Niki Regina, Teoresi Group	Embedded Security with Controller Area Network (CAN) Thilo Schumann, CAN in Automation (CiA)	nogram
	Coff	ee Break	
On-Chip Debug and Test Infrastructures of Embedded Systems from the Users Perspective Jens Braunes, PLS Programmierbare Logik & Systeme	Running Machine Learning Optimally on Heterogeneous, Low-Power Platforms Tim Hartley, ARM	Automotive Ethernet Thomas Hogenmüller, Robert Bosch	
Debugging Live Cortex-M Based Embedded Systems Jean Labrosse, Silicon Labs	Triple Core ARM Based Architecture for Radiation Environments Ross Bannatyne, VORAGO Technologies Balaji Venu, ARM	The Challenges and Opportunities of In-Vehicle Connectivity Daniel Adler, Valens	

Want more? See page 12/13 for additional classes!

TUESDAY, FEBRUARY 27, 2018

	Class 01: RISC-V Class	Class 03: From Idea to Production ECU Code in One Day	Class 05: The Bruce Douglass Class – Modeling
09:30-12:30	How the RISC-V Open Source ISA is Reshaping Chip Design and Economics Rick O'Connor, RISC-V Foundation; et al. As design cycles are getting faster and margins are tightening amid widespread consolidation, the semiconductor industry is entering a new phase of innovation and growth. RISC-V Foundation Executive Director Rick O'Connor and speakers from the RISC-V community will discuss how free, open source hardware and software are creating a paradigm shift in the industry, reinvigorating semiconductor design and reshaping traditional business models. Attendees will learn about how the RISC-V instruction set architecture (ISA) is empowering established enterprises and startups alike to innovate rapidly without the drawbacks of closed, costly ISAs.	Arndt-Michael Meyer, ETAS; et al. This one day workshop will give you the unique possibility to follow an ECU development process from the start to the end. During this journey you will see how a lot of hurdles and inefficiencies are being overcome to meet the current and future demands of development departments.	Everything you Always Wanted to Know About Flowcharts and Activity Diagrams The UML and SysML provide very good tools for specifying behavior application systems. Behavior may be specified for individual classes, subsystems, components and use cases with state machines and activity diagrams. Behavior may also be specified for elements acting in collaboration using interactions using sequence and collaboration diagrams. This workshop focuses on Activity diagrams. Advanced Behavioral Modeling Statecharts provide the ability to specify both hierarchical and concurrent behavior. Activity diagrams, while intimately related to statecharts, are used effectively to model algorithmic behavior and have been significantly extended in the SysML to include behavior that is both continuous in time and value.
			Bruce Douglass, IBM
WEDNE	SDAY, FEBRUARY 28, 2018		
		Class 07: The Bruce Douglass Class – Design Patterns and Architectures	
09:30-10:30		Design Patterns for Embedded Systems in C	
			Class 08: The Greg Davis C/C++ Class
10:30-11:30			Writing Secure and Reliable C/C++ Code
11:30-12:30			Guidelines for Writing Efficient C/C++ Code
13:30-14:30		Design Patterns for Embedded Systems in C Design patterns are generalized solutions to recurring problems and more importantly they are a way of capturing	Understanding the Shared Memory Model in C and C++ Greg Davis, Green Hills Software
14:30-15:30		and reusing design solutions that have been shown to be effective in different circumstances.	
15:30-16:30		16:00 - 17:30 The Tao of SysML Bruce Douglass, IBM	
16:30-17:30			
THURS	DAY, MARCH 1, 2018		
		Class 11: The Bruce Douglass Class – Agile Development Methods	

		Aglie Development methods	
09:30-10:00		Agile for Safety Critical Systems: Design Practices	
10:00-10:30		Agile for Safety Critical Systems: Quality Assurance Practices	
10:30-11:00	Agile for Safety Critical Systems: Design Practices Agile for Safety Critical Systems: Quality Assurance Practices Agile for Safety Critical Systems: Evidence-Oriented Practices Agile Systems Engineering Bruce Douglass, IBM ra-Low-Power Hands-on-Workshop mann Roebbers, Altran		
11:30-12:30	Class 13: Ultra-Low-Power	Agile Systems Engineering Bruce Douglass, IBM	
13:30-16:30	Ultra-Low-Power Hands-on-Workshop Hermann Roebbers, Altran		

Class 04: Cryptography - Basics

Cryptography Engineering for Embedded Devices

Dr. Falko Strenzke, cryptosource

With the emerging applications of IoT and Industry 4.0, a growing number of manufacturers of embedded devices is confronted with the problem of secure communication, firmware update and device authentication. Based on these main use cases, this workshop gives an overview of the cryptographic concepts and technologies which can be used to address these challenges.

Class 02: Introduction to Embedded Linux Theory and Practice Crash Course

Robert Berger, Reliable Embedded Systems

This one day training class uses hands-on exercises combined with instruction to illustrate some basic concepts of Embedded GNU/Linux. Hands on sessions are performed with a toolchain/rootfs built by the freely available Yocto Project, on an embedded board. This enables you to take the course material home and work with it.

Classes:

In the sessions of the conference program you hear developers and decision-makers present a variety of ideas for solutions and their experience in Embedded Systems development in concise half-hour talks. Plus a summary view of selected technologies and current trends.

Quite different the classes – in workshops lasting half a day or throughout the day reputed experts speak on special topics. This format is aimed primarily at participants who want to familiarize basically, thoroughly and efficiently in a subject matter. Straightforward dialog with the experts helps to clarify specific questions. And is an excellent opportunity of quickly expanding your current expertise. The classes are didactic to guarantee maximum learning goals.

With these classes the embedded world Conference covers in detail a broad range of substantial aspects of Embedded System development. To offer developers competent technical groundwork both compact and concentrated.

Class 06: Securing V2X Communication

Securing V2X Communication in Connected Vehicles

Dr. Thomas Wollinger, ESCRYPT; et al.

This workshop presents an overview of V2X communication security and privacy principles and details of the current state of the art for V2X security including information on various aspects of the security design, international differences, and current best practices. The attendees will be able to take away practical knowledge about V2X security as well as learn about security techniques that can be applied outside the vehicle and automotive domain. Class 09: Linux for Routers: Setup and Hardening

OpenWRT 101: How to Build a Linux Embedded System in Just 30 Minutes

Luka Perkov, Sartura; Cesare Garlati, prpl Foundation Live Hacking: Hardware-enforced Virtualization of a

Linux Home Gateway

Cesare Garlati, prpl Foundation; Dr. Michael Hohmuth, Kernkonzept

Class 10: The Nicholas McGuire Class

Class 12: Embedded Android Workshop

systems using Android.

What Could Your GNU/Linux Safety Certification Route Look Like? – Some Answers from Three Years of SIL2LinuxMP

Prof. Nicholas McGuire, Andreas Platschek; OSADL

We will present the big-picture of how we are approaching certification, main findings – some quite surprising to us – and some of the still open issues. The goal of the seminar is to present the overall work-flow in a compressed form as guidance to approaching certification of a GNU/Linux based system. Karim Yaghmour, Opersys This one-day tutorial is aimed at embedded developers wanting to build touch-based embedded Be sure to register now!





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CLASS	CLASSES embedded world Conference 2018		Tuesday, Feb 27, 2018		Wednesday, Feb 28, 2018		Thursday, March 1, 2018	
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Class 01	RISC-V Class							
Class 02	Introduction to Embedded Linux – Hands on Workshop							
Class 03	From Idea to Production ECU Code in One Day							
Class 04	Cryptography – Basics							
Class 05	The Bruce Douglass Class – Modeling							
Class 06	Securing V2X Communication in Connected Vehicles							
Class 07	The Bruce Douglass Class – Design Patterns and Architectures							
Class 08	The Greg Davis C/C++ Class							
Class 09	Linux for Routers: Setup and Hardening - Class							
Class 10	The Nicholas McGuire Class – GNU / Linux							
Class 11	The Bruce Douglass Class – Agile Development Methods							
Class 12	Embedded Android Workshop							
Class 13	Ultra-Low-Power – Hands on Workshop							

Class Fees	Early Rate until January 17, 2018	Late Rate from January 18, 2018
Half Day Class	EUR 370,	EUR 410,-
Full Day Class	EUR 540,	EUR 610,-
Conference Fees	Early Rate until January 17, 2018	Late Rate from January 18, 2018
1 Conference Block	EUR 305,-	EUR 345,-
2 Conference Blocks	EUR 415,-	EUR 470,-
3 Conference Blocks	EUR 525,—	EUR 600,-
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5 Conference Blocks	EUR 695,—	EUR 790,-
Full Conference (Classes excluded)	EUR 750,-	EUR 850,

Terms and Conditions:

- 1. The attendance fee includes participation on the booked conference days, proceedings, refreshments and free admission to the embedded world 2018 Exhibition. If morning and afternoon blocks/classes are booked, lunch is also included for that day.
- 2. You will receive a confirmation of your conference registration along with your invoice.
- 3. Cancellations received in writing before or on February 06, 2018 will be subject to a service charge of EUR 50 for oneday registrations and EUR 100 for several-days registrations. For all cancellations received after February 06, 2018 the full conference fee remains payable. Substitutions within the same company are welcome at any time.
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- 6. Exhibitors or Co-Speakers will receive a discount of 50 % limited to one person.
- 7. For registrations of five persons and more from one company, please contact our conference department for special rates.
- 8. On-site-registration: Please register in advance. For on-site-registration a surcharge of EUR 50 per attendee will apply.

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Please make sure that you are sending both pages!



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SESSIONS		Tuesday,		Wednesday,		Inursday, March 1, 2019	
embedded world Conference 2018		Rlock 1 Block 2		Rlock 3 Block 4		Block 5 Block 6	
	am	pm	am	pm	am	pm	
Functional Safety							
Hacking							
IoT I / IoT OS & Platforms							
IoT II / IoT Solutions							
Software Engineering I Languages & Standards							
Software Engineering II Software & System Development Process							
Embedded Vision – Architecture & Development							
Connectivity I / LPWA & NB-IoT							
Connectivity II / Bluetooth & Energy-Harvesting							
Autonomous Systems / Architectures & Applications							
Securing Embedded Devices							
FPGA based Hardware Solutions							
RTOS I Basics							
RTOS II Automotive							
IoT III Payment							
Power Supply Design and Management							
Software Engineering III Software Quality I							
Software Engineering IV Software Quality II							
Embedded Linux							
Connectivity III / 80215.4, 6Lo & Mesh I							
Connectivity IV / 80215.4, 6Lo & Mesh II							
Autonomous Systems III Sensors & Sensor Fusion							
Autonomous Systems IV Machine Learning							
Hardware Periphery & Interfaces							
Vision III / Cameras, Modules & Solutions							
Cryptography							
MISRA C/C++							
Virtualization & Separation							
Embedded GUI & Augmented Reality							
Multicore Systems							
Software Engineering V Software Design & Modeling							
Software Engineering VI Software Testing							
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