

Brisbane
20 March

Adelaide
23 March

Tech Days is free to attend but places are limited.
For more information and to register, head to
www.dedicatedsystems.com.au/techdays

TECH DAYS 2018

EXPO • SEMINARS • WORKSHOPS



**Dedicated
Systems**

**Building reliability, safety and security into
complex software and systems**

Dedicated Systems, in conjunction with its suppliers and technology partners, is pleased to announce our 3rd annual Tech Days events to be held in Brisbane and Adelaide. Tech Days has been designed as a way of providing up to date information to software and systems engineers, systems architects, hardware engineers, project managers and researchers involved in the design and build of complex systems, with performance, reliability, safety or security requirements.

FEATURED PRESENTERS



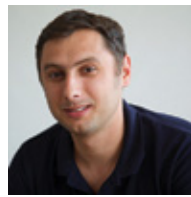
Dr. Paul Anderson is VP of Engineering at GrammaTech. In this role, Dr. Anderson is actively involved with industry regulatory requirements and software best practices for which static analysis techniques, via source or binary analysis, can be used to find and eliminate software defects that impact

quality and security. He received his B.Sc from King's College, University of London, and his Ph.D. from City University London. His research has been reported in numerous articles, journal publications, book chapters, and international conferences. Dr. Anderson is a senior member of the ACM, and has been with GrammaTech since 1991.



Dr. Howard Wang has been with RTI since 1996 and is responsible for expanding the adoption of DDS in the Asia Pacific region. He is an expert in embedded real-time systems specialising in network communications and systems integration. Howard has consulted with the NASA

Kennedy Space Center in helping to rewrite the launch and processing software for the Space Shuttle and next generation launch vehicles for the US space program. He holds a PhD and an MS in Aeronautics and Astronautics from Stanford University, as well as BSEs in Aerospace and Computer Engineering from the University of Michigan. Howard has authored several papers presented in international journals and conferences.



Eric Perlade is a Technical Account Manager at AdaCore. He is responsible for providing technical assistance, training and consulting services to AdaCore's customers. As a software engineer and aerospace enthusiast he started his career working for Airbus France developing critical software

for hard real-time systems. Eric holds a Masters Degree in critical software engineering from Université Paris 7 as well as a pilot licence.



Kiran Kumar is a Field Application Engineer at Wind River. He has over 21 years of experience with embedded software and systems spanning industries such as Aerospace and Defence and Industrial Automation. His current work includes assisting customers in architecting safety

systems in a number of avionics platforms. He has previously worked at GE Fanuc Automation where he was responsible for commissioning safety systems for power plants, refineries and to other process control applications. He's also worked in technical roles at GE Intelligent Platforms (Now Abaco), Mistral Solutions (Channel Partner for Curtiss Wright and Wind River) and he has extensive experience in systems engineering, troubleshooting, and the provision of consulting services. Kiran has both a Masters of Technology Degree in VLSI & Embedded Systems from Visvesvaraya Technological University and MBA from KSOU, India.

AGENDA

Tuesday 20th March 2018

Brisbane: Rydges - South Bank

Friday 23rd March 2018

Adelaide: Innovation House, Technology Park - Mawson Lakes

8.30am	Exhibition and Registration
8.45am	Welcome and Introduction / John Salerno, Dedicated Systems
9.00am	Under the Hood of Advanced Static Analysis / Dr. Paul Anderson, GrammaTech
9.50am	Safety and Security for Autonomous Drive / Dr. Howard Wang, RTI
10.30am	Morning Tea
10.50am	Guaranteeing Software Quality Through Formal Verification / Eric Perlade, AdaCore
11.40am	Multi-core and the Challenges of Certification / Kiran Kumar, Wind River
12.30pm	Lunch Sponsored by Wind River WIND™
1.15pm	Enabling the use of GPUs and SoCs in Safety Critical Avionics Systems / Dan Joncas, CoreAVI
2.00pm	Effective Requirements Management as a Foundation to ALM / Kevin Hansen, Polarion ALM / Siemens
2.45pm	Developing Autonomous Systems with MATLAB and Simulink / Alex Shin, MathWorks

PRESENTATION TOPICS

Under the Hood of Advanced Static Analysis

Dr. Paul Anderson, GrammaTech

Advanced static analysis tools are now widely accepted as essential tools to help software engineers develop high quality code. The number of possible program states is extraordinarily large even for very simple programs, so any tools must use sophisticated analysis techniques if they are to work on real-world programs. These techniques are designed in a way that allows a user to make a three-way trade-off between performance, precision, and recall. Static analysis users can increase the value they get from these tools if they have a good understanding of how to tune the tools to strike the right balance between these factors. This presentation will describe some of the principles of advanced static analysis including flow-, context-, and path-sensitivity, and outline some of the innovative algorithms that the tools use to achieve scalability to multiple millions of lines of code.

Safety and Security for Autonomous Drive

Dr. Howard Wang, RTI

With the growth of autonomous driving, the automotive industry now requires technical capabilities, such as high-performance computing, in-vehicle communications, cloud-based applications and advanced data processing, while still meeting the highest safety and security requirements. RTI Connex[®] DDS software accelerates the design and development of such autonomous systems by providing an efficient path from prototyping to production and safety certification. RTI has more than a dozen autonomous vehicle customers, including cars, trucks, and even autonomous air taxis, who are beyond the research stage and entering final proof-of-concept or full production-track status. This talk will present an overview of the software architecture underlying autonomous vehicle systems, discuss the safety and security requirements such as ISO 26262 and DO-178C, and show how RTI's software products address the needs of this exciting new industry.

Guaranteeing Software Quality Through Formal Verification

Eric Perlade, AdaCore

With an increasing number of systems driven by embedded software performing critical functions, there is a requirement for strong techniques and tools to reach the expected level of quality. Exhaustiveness is the Achilles heel of software testing, and, as a result, formal verification is gaining traction in the industry. Once the domain of researchers and experimental projects, formal methods are now within easy reach. This presentation will cover the industrial-ready solution based on the Ada language to write safe and secure embedded software. Ada 2012, with programming by contract paradigm, opens doors to formal verification. Examples will be used to show how from the lowest level of writing drivers to the highest level of safe tasking, a programming language can make the difference. Integrating dynamic testing and formal proof will also be discussed leading to the incremental adoption of formal methods.

Multi-core and the Challenges of Certification

Kiran Kumar, Wind River

With wide availability and continual reduction in size, weight and power (SWAP), multi-core processors have become extremely attractive for use in avionics systems. Implementing a solution using a multi-core platform adds complexity and certification obstacles that are not present in uni-core processor implementations. Achieving safety certification of a multi-core system requires close collaboration between the avionics developers, semiconductor vendors and regulatory agencies, as evolving certification policies and guidance include both hardware and software aspects of certification. This session will cover the work done by Wind River to implement a COTS ARINC 653 solution for multi-core and provide guidance to the service providers on the issues that must be addressed in order to understand the potential benefits and certification limitations of multi-core solutions.

TECH DAYS EXPO

The exhibit is free to attend and runs from 8.30am through to 3.30pm. You are welcome to pop in for a quick visit or stay longer and sit in on the presentations. Subject matter experts from leading technology companies will be available throughout the day to discuss your applications and answer any queries you may have.



PRESENTATION TOPICS



Enabling the Use of GPUs and SoCs in Safety Critical Avionics Systems

Dan Joncas, CoreAVI

There is a growing and significant demand for the deployment of safety critical compute and graphics technologies in aerospace and defence applications. Next generation mission computers, flight displays, synthetic vision and UAV platforms require advanced graphics and compute capabilities that can be most effectively achieved by utilising modern graphics processors.

CoreAVI is the world's leading supplier of safety critical graphics and compute drivers, hardware IP and certification data packages that enables the use of advanced graphics and system-on-chip processors in the military and avionics markets. Their solutions have been certified to the highest levels of safety certification and are flying in military and commercial avionics display systems worldwide.

This presentation outlines CoreAVI's product portfolio, including their COTS-D (DO-254 hardware IP), and safety critical video, graphics, and compute drivers that enables the latest GPUs/SoCs to be used in avionics systems. New open standards and GPUs/SoCs to support future display and compute system capabilities will be explored.



Effective Requirements Management as a Foundation to ALM

Kevin Hansen, Polarion ALM / Siemens

It is common for organisations to manage their requirements in some disconnected way. Excel spreadsheets, Word documents, standalone / isolated requirement tools to name a few. This disconnection from the rest of the product lifecycle limits the ability to influence design towards compliance. As a result, when requirements or design change it is difficult to assess the impact, connection, or risk which often means you end up in the wrong place and are no longer compliant. This session will demonstrate how Polarion ALM enables a modern, web based, fully traceable software development lifecycle based on a solid foundation – Requirements Management.



Developing Autonomous Systems with MATLAB and Simulink

Alex Shin, MathWorks

Autonomous technology will touch nearly every part of our lives, changing the products we build and the way we do business. MATLAB and Simulink provide algorithms and hardware connectivity for developing autonomous systems. In this presentation, we will highlight capabilities for developing autonomous systems such as deep learning and object detection, path planning and object avoidance, and connectivity to HW platforms.

TECH DAYS WORKSHOPS

We are currently planning a number of free, half day, workshops. Location, further details and schedule to be confirmed. Please register your interest through www.dedicatedsystems.com.au/techdays and we'll keep you updated.

Workshops:

- Ada for C and C++ Developers - [Eric Perlade, AdaCore](#)
- Introduction to DDS Programming - [Dr Howard Wang, RTI](#)
- Introduction to DDS Security - [Dr Howard Wang, RTI](#)
- Extending and Customising Static Analysis - [Dr Paul Anderson, GrammaTech](#)
- Troubleshooting Embedded Systems - [Kiran Kumar, Wind River](#)

CONTACT OUR EXPERTS

If you are unable to make it to Tech Days but would like a visit or a call from one of our suppliers, please contact us at team@dedicatedsystems.com.au or **(08) 8299 9333** to arrange.