North American User Conference 2008

In-Vehicle Electronic Content on the Rise

Wajiha Chahine, Software Testing Supervisor at Ford Motor Company, and Mina Khoee-Fard, Engineering Group Manager at General Motors, answer questions from the audience. Mina Khoee-Fard gave the keynote speech at the HIL session.

Automakers are constantly challenged to roll out new, innovative features that will make vehicles more appealing, safe, reliable and efficient. But with every new add-on, OEMs have to address the issue of growing technical complexity.

While the management of electrics/electronics (E/E) complexity represents a real challenge to the automotive industry, the growth of electronics in vehicles isn't expected to slow down any time soon. This was the common message shared at the dSPACE North American User Conference held in Michigan September 23-25, 2008. More than 170 attendees from automotive OEMs, Tier Ones, tool suppliers, and the aerospace/defense, off-highway/commercial and academic communities participated in the conference.

Panel Discussion

During an executive management panel discussion themed on major management challenges related to embedded software development, representatives concurred that the

Dr. Herbert Hanselmann, CEO, dSPACE; Jim Brogoitti, Manager, Core Systems and Software Engineering Electronics and Safety, Delphi; Alan Amici, Director of Vehicle Development, Chrysler LLC; Christopher Davey, Senior Technical Leader - Software & Control Systems Engineering, Ford Motor Co.; Kent Helfrich, Director of Software Engineering, General Motors Powertrain (left to right).

> "The conference brought high value to my colleagues and me in terms of the breadth of experience presented by a variety of users, in the detail introduced in the workshops, and in the observations of the panelists."
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> *Ken Leininger, In-Vehicle Tools PDT Leader, Controls Engineering Tools Group, GM*

need for safer, more fuel-efficient and environmentally friendly vehicles is leading the automotive industry to incorporate more electronic content into the vehicle.
Kent Helfrich, Director of Software Engineering, General Motors Powertrain, said powertrain software for the GM global product portfolio is projected to ramp up significantly. Helfrich presented a timeline chart for the period of 1999 to 2014. From 1999 until around 2003, he noted a decline in the complexity of the embedded software product line within General Motors Powertrain as the company converged its powertrain portfolio. Since 2003, he said the complexity of GM's powertrain embedded software product line has been on the rise and will not flatten out until the middle of the next decade. "This is a great time to be a powertrain controls engineer in GM," Helfrich said. "All our advanced propulsion technologies will be enabled by embedded control systems. We are writing history as we bring these technologies to market."

Audience Feedback

Audience members concurred that similar trends are occurring at their companies. As part of an electronic survey that was conducted during the opening day of the User Conference, attendees were asked to provide their opinions on when electronics in automobiles will stop growing. 83% responded that it will be 10 or more years before the use of in-vehicle electronics comes close to peaking. What are the reasons for this continued growth?

Critical for Safety, Reliability and Functionality Requirements

One of the main influential factors is the across-the-board realization that embedded electronics and mechatronics are critical to meeting growing safety, reliability and functionality requirements, not to mention the numerous "must-have" comfort and convenience features that are demanded by today's car buyers. Moreover, the development of advanced propulsion and control technologies – such as hybrid-electric, fuel cell and autonomous vehicles – are introducing more ECUs to the vehicle.
Another major factor is the roll-out of standards such as AUTOSAR (AUTomotive Open System ARchitecture) and FlexRay. While these specifications are more widely known in Europe than in the United States, they deliver strong incentives for OEMs, suppliers and tool developers seeking to manage growing electrics/electronics (E/E) complexity.
During the opening keynote speech delivered by Dr. Herbert Hanselmann, the dSPACE CEO and founder gave insight on the dSPACE tool chain and new products that are emerging to address industry needs for embedded controls development. He said dSPACE is addressing the E/E complexity issue with the roll-out of its new architecture design tool – SystemDesk. SystemDesk helps software developers to plan, implement and integrate complex system architectures and distributed electronic control systems that are AUTOSAR-compliant.

Presentations from Automotive, Aerospace and Academic Industries

User application experiences are the traditional focal point of dSPACE User Conferences. The North American conference featured 19 presentations – 14 delivered by dSPACE tool users from the automotive, aerospace and academic industries and 5 given by dSPACE technical

Dr. Herbert Hanselmann, CEO, dSPACE; Kevin Kott, President of dSPACE Inc. (left to right).

Wajiha Chahine, Software Testing Supervisor, Ford Motor Co.; Mina Khoee-Fard, Engineering Group Manager, Global Systems Engineering, Advanced Development and Validation, GM; Rohinikumar Adivi, Engineering Project Team Lead, Caterpillar Inc.; and, Peter Hartman, Senior Manager, Powertrain Controls, Chrysler LLC. (left to right).

experts. Topics ranged from model-based design and production code generation to verification and validation strategies. Presenting companies included: Argonne National Laboratory, Bombardier Transportation, BOSCH Motorsports, Caterpillar Inc., ChallengeX/EcoCAR: The NeXt Challenge; Chrysler LLC, Delphi, FEV Inc., Ford Motor Co., GM, and MPC Products.

> "Many times, during economic cut backs, the verification phase is the first part of a project that funding gets cut. This conference showed both its importance and what everyone else is attempting to do in this area. Hence, great conference, and keep it up."
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> *Ronald Fassnacht, Supervisor Powertrain HIL Team, Chrysler LLC*

HIL Technology Day

The second day of the User Conference was dedicated to a series of presentations on hardware-in-the-loop (HIL) technology. Mina Khoee-Fard, Engineering Group Manager, Global Systems Engineering, Advanced Development and Validation, GM, kicked off the HIL session with a keynote speech on GM's global HIL initiative and the role of HIL in the electrical and electronics software verification process for integration testing. She highlighted the strategic approach behind global HIL application in the E/E area and the harmonized processes and methods for enabling usage of HIL systems in 10 major vehicle engineering centers in GM. The keynote speech also touched upon the challenges of global E/E architecture, its implications on HIL application strategy, and the approach taken for addressing these challenges.

Product Workshops

On the final day of the conference, dSPACE technical experts hosted a series of 1-1/2 hour workshops. The sessions gave conference attendees an opportunity to hear more in-depth discussions related to dSPACE solutions for model-based design, AUTOSAR, CalDesk, autocoding with TargetLink, Automotive Simulation Models (ASM) and HIL test systems.

On behalf of dSPACE, we sincerely appreciate the high level of participation and contribution provided by our panelists, guest presenters and exhibitors. We hope conference attendees gained valuable information and insight on the pace of the constant change occurring within the embedded controls industry. ■

For more information on upcoming dSPACE events, visit our Web site at www.dspace.com