

# Automotive CPS Workshops

The goal of this workshop series is to continue to define and refine the technology needs and gaps for deeply-embedded software-intensive electronic control systems that interact deeply with the physical world in ways that have stringent reliability, availability, and safety requirements

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### The Cyber-Physical Systems Virtual Organization <http://cps-vo.org/>

presented at  
Developing Dependable and Secure Automotive Cyber-Physical Systems from Components  
March 17-18, 2011  
Troy, MI  
by  
[Chris.vanBuskirk@vanderbilt.edu](mailto:Chris.vanBuskirk@vanderbilt.edu)  
Institute for Software Integrated Systems, Vanderbilt University



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Submitted by [pattipati](#) on Thu, 02/24/2011 - 10:52pm. Contributors:  
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Submitted by [Sibin Mohan](#) on Fri, 02/25/2011 - 10:34am. Contributors:  
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The demand for higher performance computing platforms has dramatically increased during the last decade due to the continuous feature enhancement process. For instance, in automotive systems new safety features like `night view assist? and `automatic emergency breaking? require the fusion of sensor data, video processing and real-time warnings when an obstacle is detected on the road; in the avionics domain new applications such as the helmet-mounted display systems require intensive video processing capabilities.



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## [Challenges In Representing CPS Safety](#)

Submitted by [pkoopman](#) on Thu, 02/24/2011 - 10:48pm. Contributor:  
[Philip Koopman](#)

This position paper describes the challenge of ensuring run-time safety in cyber-physical systems. The overarching problem is ensuring that computer-based systems will maintain safe operations even in the face of design-time and run-time faults. One way to address this problem is by creating an ability to perform run-time safety checks on CPS applications that can be used to record hazards, trigger emergency shutdowns (where doing so is safe), or perform other actions to minimize the consequences of an unsafe system behavior.



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## [Verifiable Active Safety for Automotive Cyber-Physical Systems with Humans in the Loop](#)

Submitted by [bajcsy1](#) on Thu, 02/24/2011 - 10:53pm. Contributors:  
[Ruzena Bajcsy](#)[Karl Hedrick](#)[Francesco Borrelli](#)

A recent trend in the automotive industry is the rapid inclusion of electronics, computers and controls that focus entirely on improved functionality and overall system robustness. This makes the automotive sector one of the richest targets for emerging innovations in Cyber-Physical Systems (CPS) [1]. While this trend has affected all of the vehicle areas, there is a particular interest in active safety that effectively complements passive safety. Passive safety is focused on the structural integrity of the vehicle.



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## [Fault-Tolerance of Embedded Systems with Automotive Applications](#)

Submitted by [Rajkumar](#) on Fri, 02/25/2011 - 10:32am. Contributors:  
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## [CPS Workshop on Developing Dependable and Secure Automotive Cyber-Physical Systems from Components](#)

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## Cyber-Physical Systems: NIST Role and Current Programs

Submitted by [Albert.Wavering](#) on Mon, 04/11/2011 - 2:59pm. Contributor:  
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