

# CPS Architectures

The mission of this online community of CPS architectures is to share research results on using cyber-physical system architectures to support design, analysis and verification of complex cyber-physical systems using heterogeneous modeling formalisms.

## Node: Type

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## [2018 Workshop on Modeling and Simulation of Cyber-Physical Energy Systems: 10 April 2018, Porto, Portugal](#)

Submitted by [palensky](#) on Thu, 11/23/2017 - 10:02am

Dear Colleagues,

It is my pleasure to invite you to the upcoming **Workshop on Modeling and Simulation of Cyber-Physical Energy Systems!**

<http://www.palensky.org/mscpes/2018>

After Berkeley, Berlin, Seattle, Vienna, and Pittsburgh, we are this time in beautiful Porto, Portugal, again co-located with the annual Cyber-Physical Systems Week.

Full paper submission deadline is 4th February 2018. Accepted and presented papers will be submitted to IEEE Xplore digital library.



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## [HARSH 2016](#) [Mar 12, 2016 7:00 am - 6:00 pm CET](#)

Submitted by Anonymous on Tue, 11/10/2015 - 1:43pm

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## [IDEA 2016](#)

[Apr 11, 2016 7:00 am - 6:00 pm CEST](#)

Submitted by Anonymous on Tue, 11/10/2015 - 1:12pm

### **2nd International Workshop Integrating Dataflow, Embedded computing and Architecture (IDEA 2016)**

Vienna, Austria, April 11, 2016 | <http://caes.ewi.utwente.nl/idea2016>

*in conjunction with CPS week 2016 (<http://www.cpsweek.org/2016>)*



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## [ASPLOS 2016](#)

[Apr 02, 2016 7:00 am - Apr 06, 2016 6:00 pm EDT](#)

Submitted by Anonymous on Tue, 11/03/2015 - 12:18pm

### **Twenty First International Conference on Architectural Support for Programming Languages and Operating Systems**

ASPLOS is the premier forum for multidisciplinary systems research spanning computer architecture and hardware, programming languages and compilers, operating systems and networking, as well as applications and user interfaces. The research may target diverse goals such as performance, energy and thermal efficiency, resiliency, security, and sustainability.



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## [Architectural Abstractions for Hybrid Programs](#)

Submitted by [ivan](#) on Wed, 06/24/2015 - 12:32pm. Contributors:

[Ivan Ruchkin](#)[Bradley Schmerl](#)[David Garlan](#)

**Abstract:** Modern cyber-physical systems interact closely with continuous physical processes like kinematic movement. Software component frameworks do not provide an explicit way to represent or reason about these processes. Meanwhile, hybrid program models have been successful in proving critical properties of discrete-continuous systems. These programs deal with diverse aspects of a cyber-physical system such as controller decisions, component communication protocols, and mechanical dynamics, requiring several programs to address the variation.



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news

## "Architectural Abstractions for Hybrid Programs" wins the best paper award at CBSE/CompArch 2015

Submitted by [ivan](#) on Wed, 06/24/2015 - 1:30pm

A paper from Carnegie Mellon University titled "*Architectural Abstractions for Hybrid Programs*" wins a Distinguished Paper Award at the 18th International Symposium for Component-Based Software Engineering (CBSE), part of the CompArch federated conference series (Component-Based Software Engineering and Software Architecture). You can view the presentation slides [here](#).



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## Supporting Heterogeneity in Cyber-Physical Systems Architectures

Submitted by [ivan](#) on Wed, 06/24/2015 - 12:32pm. Contributors:

[Akshay Rajhans](#)[Ajinkya Bhavel](#)[van Ruchkin](#)[Bruce Krogh](#)[David Garlan](#)[André Platzer](#)[Bradley Schmerl](#)

**Abstract:** Cyber-physical systems (CPS) are heterogeneous, because they tightly couple computation, communication and control along with physical dynamics, which are traditionally considered separately. Without a comprehensive modeling formalism, model-based development of CPS involves using a multitude of models in a variety of formalisms that capture various aspects of the system design, such as software design, networking design, physical models, and protocol design.



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## Contract-Based Integration of Cyber-Physical Analyses

Submitted by [ivan](#) on Wed, 06/24/2015 - 12:36pm. Contributors:

[Ivan Ruchkin](#)[Dionisio de Niz](#)[Sagar Chaki](#)[David Garlan](#)

**Abstract:** Developing cyber-physical systems involves multiple engineering domains, e.g., timing, logical correctness, thermal resilience, and mechanical stress. In today's industrial practice, these domains rely on multiple analyses to obtain and verify critical system properties. Domain differences make the analyses abstract away interactions among themselves, potentially invalidating the results. Specifically, one challenge is to ensure that an analysis is never applied to a model that violates the assumptions of the analysis.



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## ACTIVE: A Tool for Integrating Analysis Contracts

Submitted by [ivan](#) on Wed, 06/24/2015 - 12:36pm. Contributors:

[Ivan Ruchkin](#)[Dionisio de Niz](#)[Sagar Chaki](#)[David Garlan](#)

**Abstract:** Development of modern Cyber-Physical Systems (CPS) relies on a number of analysis tools to verify critical properties. The Architecture Analysis and Design Language (AADL) standard provides a common architectural model to which multiple CPS

analyses can be applied. Unfortunately, interaction between these analyses can invalidate their results. In this paper we present *ACTIVE*, a tool developed within the OSATE/AADL infrastructure to solve this problem.



[Aerospace Avionics Real-Time Systems Symposium - RTSS 2014 Conference paper Academia USA Research Organization Papers](#)

event



## [CPSArch at Embedded Systems Week](#) [Oct 17, 2014 9:00 am - 5:00 pm +05](#)

Submitted by [Marilyn Wolf](#) on Wed, 07/23/2014 - 12:48pm

CPSArch 2014

First Workshop on Cyber-Physical System Architectures and Design Methodologies

October 17, 2014, New Delhi, India. Held as part of ESWEEK 2014.

<http://cpsarch.ecn.purdue.edu/>



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