The Eighteenth Annual

High Confidence Software and Systems (HCSS) Conference

Call for Presentations and Posters

INTRODUCTION

The eighteenth annual High Confidence Software and Systems (HCSS) Conference will be held May 7-9, 2018 at the Historic Inns of Annapolis in Annapolis, Maryland. You are invited to submit a proposal to present a talk at this year's conference. As in previous years, you are also invited to participate in a poster session. See details below for more information.

BACKGROUND

Our security, safety, privacy, and well-being are all increasingly dependent upon the correctness, reliability, resilience, and integrity of software-intensive systems of all kinds, including cyber-physical systems (CPS). These systems must be capable of interacting correctly, safely, and securely with humans, with diverse other systems, and with the physical world, even while they operate in changing, difficult-to-predict, and possibly malicious environments. New foundations in science, technology, and methodology continue to be needed. Moreover, these methods and tools have to be transitioned into mainstream use to build and assure these systems--and to move towards more effective models for acceptance and certification.

CONFERENCE SCOPE, GOALS, AND VISION

The High Confidence Software and Systems (HCSS) Conference draws together researchers, practitioners, and management leaders from government, universities, and industry. The conference provides a forum for dialogue centered upon the development of scientific foundations for the assured engineering of software-intensive complex computing systems and the transition of science into practice. The technical emphasis of the HCSS conference is on mathematically-based tools and techniques, scientific foundations supporting evidence creation, systems assurance, and security. The HCSS vision is one of engaging and growing a community--including researchers and skilled practitioners--that is focused around the creation of dependable systems that are capable, efficient, and responsive; that can work in dangerous or inaccessible environments; that
can support large-scale, distributed coordination; that augment human capabilities; that can advance the mission of national security; and that enhance quality of life, safety, and security.

CONFERENCE THEMES

We invite submissions on any topic related to high-confidence software and systems that align with the conference scope and goals listed above. In addition, the 2018 HCSS Conference will highlight the following themes:

* **Complex Heterogeneous Systems**: High-assurance systems are commonly assembled, adapted, and composed from other systems. The increasing complexity of the composed system challenges our ability to verify such systems. Automotive, military and commercial aviation systems are excellent examples where many independent vendors produce subsystems that are assembled into systems that must in some way be certified. To achieve this we need methods for building assurance from compositions by bringing together evidence from multiple, heterogeneous sources. Topics of interest include composing evidence, composing formal methods, the relationship between evidence and certification, case studies of system certification, provenance of evidence, and techniques for targeting formal methods in the design process.

* **Trusting Autonomy**: Significant advances are being made in learning and adaption that will revolutionize autonomous system development. Many of the underlying technologies, including machine learning, deep neural networks, probabilistic languages, planning and optimization, are not amenable to verification using traditional methods. This limits how much functionality can realistically be fielded, and will limit use of these technologies in many critical applications, such as in manned and unmanned vehicles. Topics of interest include autonomous behavior specification methods, hybrid logics, new architectural and monitoring approaches, automated analysis of autonomous systems, needed changes in certification/verification regimens, and experience reports of incorporating autonomy into safety and security critical systems.

* **Blockchain Assurance**: The emergence of blockchain technologies in critical domains raises questions about its security and effectiveness. Using the distributed integrity of a blockchain ledger presents unique opportunities, but introduces new assurance challenges that must be addressed before protocols and implementations can live up to their potential. Topics of interest include high-assurance use cases for blockchain, assurance of blockchain infrastructure properties, assuring blockchain end nodes properties, and certification/verification of blockchain applications.

CONFERENCE PRESENTATIONS
The conference program features invited speakers, panel discussions, poster presentations, and a technical track of contributed talks.

**Technical Track Presentations**

The technical track features two kinds of talks:

* **Experience reports.** These talks inform participants about how emerging HCSS and CPS techniques play out in real-world applications, focusing especially on lessons learned and insights gained. While experience reports do not have to be highly technical, they should emphasize substantive reflection on all aspects of experience, building on data and direct experience. Experience reports can focus on topics such as transitioning science into practice, architecture and requirements, use of advanced languages and tools, evaluation and assessment, team practice and tooling, supply-chain issues, and so on.

* **Technical talks.** These talks highlight state-of-the-art techniques and methods for high-confidence software systems with an emphasis on how those techniques and methods can be used in practice. Presenters of these talks should strive to make their material accessible to the broader HCSS community even as they discuss deep technical results in areas as diverse as concurrency analysis, hybrid reasoning approaches, theorem proving, separation logic, analysis, synthesis, analytics, various modeling techniques etc.

If you are interested in offering a talk--or nominating someone else to be invited to do so--please upload an abstract of **one page or less** for your proposed talk or a **one paragraph description** of your nominee's proposed talk by **December 15, 2017** to https://cps-vo.org/hcss18/presentation/cfp.

Abstracts and nomination paragraphs should clearly indicate why the talk would be relevant to HCSS and which, if any, of this year's themes the talk would address. Notifications of accepted talks will be made by **Friday, January 19, 2018**.

**POSTER PRESENTATIONS**

If you are interested in participating in the poster session, please upload an abstract of your proposed poster theme with title by **Friday, February 23, 2018** to https://cps-vo.org/hcss18/poster/cfp. Abstracts should clearly indicate why the poster is relevant to HCSS and which, if any, of this year's themes the poster would address. Notifications of accepted posters will be made by **Friday, March 23, 2018**.

The conference organizers will print posters free of charge if design content is electronically submitted by **Friday, April 20, 2018**. After April 20, poster session participants will be responsible for the printing and delivery of their own posters. Content designs of accepted posters can be submitted electronically in PDF format. The conference organizers will provide easels, foam boards, and tacs for all poster displays. Poster session participants should contact the conference organizers.
organizers in advance if additional materials or props are desired.

ADDITIONAL INFORMATION

Further instructions for electronically submitting camera-ready abstracts, final slide presentations of accepted talks and poster designs will be provided in the notification message that will be sent on Friday, January 19, 2018. Abstracts of accepted talks and posters will be printed in the 2018 HCSS Conference proceedings.

IMPORTANT DATES

Presentations:
Proposed Talk Submissions: Friday, December 15, 2017 extended to Friday, January 5, 2018
Notification of Talk Decisions: Friday, January 19, 2018
Camera-Ready Talk Abstracts Due: Friday, February 23, 2018
Presentation files due: Sunday, May 6, 2018

Posters:
Proposed Poster Submissions: Friday, February 23, 2018
Notification of Poster Decisions: Friday, March 23, 2018
Poster Files Due: Friday, April 20, 2018

HCSS Conference: May 7-9, 2018

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