IEEE CSS Technical Committee on Hybrid Systems

TC Meeting at the 61st IEEE Conference on Decision and Control

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Introduction

- The Technical Committee on Hybrid Systems is dedicated to provide informational forums, meetings for technical discussion, and information over the web to researchers in the IEEE CSS who are interested in the field of hybrid systems and its applications

- Members: 138 active members (68 members at ACC 2018)
  - Academia: 118 members
  - Industry: 20 members

Introduction

- TC Co-chairs:

TC Website Co-Chair	**TC Wikipage Co-Chair**	**TC Toolboxes Co-Chair**

Jana Tumova
KTH Royal Institute of Technology

Sadegh Soudjani
Newcastle University

Manuel Mazo Jr
Delft University of Technology

Introduction

- New TC Webpage

  http://ieeecss.org/tc/hybrid-systems

  Updated regularly with new members, tools, and reports

- TC Google group

  HybridSystemsTC@googlegroups.com

  Members are encouraged to email announcements

TC Activities: CSM article

- About every year and a half, our TC is required to write an article for the IEEE Control Systems Magazine (CSM) summarizing the activities done during the year;

  (We submitted one in September 2021)

- Sample activities:
  - Organization of invited sessions at conferences
  - Organization of workshops, tutorials, and conferences
  - Special issues in journals
  - Service to the field, such as Editor/AE of journals, active role in professional societies, etc.
  - Outreach activities

- I will reach out to you around the end of this year for inputs!

TC Activities: CEB Nominations

- Around 30 new appointees every year

- Each TC recommends one person for the next batch of CEB recommendations

- Nomination: Very simple 1-page bio-sketch (template provided by CSS)

- Deadline usually in January

- I will email TC members around the end of the year for (self-)nomination!

Selected Recent TC Activities

- A tutorial session on "Event-Triggered Control" during ECC 2022, Organizers: Maurice Heemels, Dragan Nesic, Alejandro Maass, and Romain Postoyan

- Workshop on "Computation-Aware Algorithmic Design for Cyber-Physical Systems", during CPS-IoT Week 2022, Organizers: Murat Arcak, Abhishek Halder, Heiner Litz, Linh Phan, Ricardo Sanfelice, and Majid Zamani

- Workshop on "Learning and Control for Safety-Critical Systems", during ACC 2022, Organizers: Negar Mehr, Melkior Ornik, and Yagiz Savas

- Invited session on "Modular Design and Verification of Control Systems" during CDC 2022, Organizers: Bart Besselink, Antoine Girard, and Karl H. Johansson

- Special Issue of Nonlinear Analysis: Hybrid Systems on "Security, Privacy and Safety of Cyber-Physical Systems", Guest editors: Kai Cai, Maria Prandini, Xiang Yin, and Majid Zamani

- EECI IGSC Course on "Formal methods in control design - from discrete synthesis to continuous controllers" in Stockholm, Organizers: Calin Belta and Antoine Girard

- Birkhauser Book Series on "Computation-aware Algorithmic Design for Cyber-Physical Systems", Editors: Maria Prandini and Ricardo Sanfelice

TC Outstanding Student Paper Prize

1. *Concept and rationale:*
   - Each award is given at the year N+1 to a student who is the main author of a paper presented at the CDC or CCTA of year N and is also a member of the TC
   - Each TC has its own award (or jointly with another TC) whose title includes the name of the TC (or both TC), e.g., named "Hybrid Systems TC Outstanding Student Paper Prize"
   - These awards fulfills two objectives:
     - Recognize young talent associated with a technical area
     - Promote student membership and participation in the TCs
   - The award is presented at the TC meeting at the CDC

2. *Who qualifies*:
   - The main student awardee must be a TC member

TC Outstanding Student Paper Prize

3. *Nomination*: the goal is to have a minimalist nomination process
   - All papers mainly authored by students that belong to the TC are eligible for the award.
   - When a student belongs to multiple TCs, the VPTA decides which TC should consider the paper, in consultation with the TC chairs.
   - Any TC member can nominate a paper through an email to the TC chair. The email needs to contain a statement that the primary author of the paper was a student at the time of paper submission.
   - Self-nominations are allowed, but the nomination email must be carbon-copied to all the authors.
5. *Selection Process*:
   - The selection committee consists of 4-5 person selected by TC chair in consultation with CSS awards chair and/or the VPTA.
   - The selection process is mostly managed by TC chair.

TC Outstanding Student Paper Prize 2022

1. In total, we received 6 nominations

2. Committee members:
    1. Samuel Coogan
    2. Raphael Junger
    3. Romain Postoyan
    4. Majid Zamani

3. Two stage selection process:
    I.   Each committee member reads all 6 papers, and independently rates the following three aspects of each paper with scores from 1 to 5 (low to high). These 3 aspects are essentially from the "Basis for Judging" for the CDC best student paper award i) Originality; ii) Clarity; and iii) Potential impact on practical applications or theoretical foundations of HS
    II. We calculate the average scores for all papers (equal weight of the above 3 aspects, and equal weight of the five committee members). Finally, four members vote to select the winner (majority rule).

TC Outstanding Student Paper Prize 2021

Elis Stefansson and Karl H. Johansson

"*Computing Complexity-aware Plans Using Kolmogorov Complexity*"

The list of awardees and details on the nomination can be found here:

http://ieeecss.org/tc/hybrid-systems/tc-award

Nomination deadline for the TC Student Award 2023: **February 28, 2023**

Please nominate your students' papers being presented here!

TC Activities: Tools for hybrid systems

http://ieeecss.org/tc/hybrid-systems/tools

CSS Day: Background

- A designated day followed by week-long activities around the world to

    - Celebrate CSS impact

    - Improve CSS communications

    - Enhance CSS visibility

    - Engage the broader engineering community

    - Expand CSS diversity

- Modeled after PES-Day https://site.ieee.org/pes-day/ and IEEE-Day https://ieeeday.org

- 1st CSS-Day was on October 19, 2022 (http://ieeecss.org/css-day-2022)

TCs can lead different activities in the future!

Announcement

I am organizing a special section entitled "Formal Verification and Synthesis of Cyber-Physical Systems" in [IEEE Open Journal of Control Systems](#);

Please submit your related work!

Deadline: March 15, 2023

There are agreements in place with the UC system as well as University of Illinois to waive the publishing fees!

Announcement

The 8th IFAC Conference on Analysis and Design of Hybrid Systems will take place in Boulder!

General chair: Majid Zamani

Program chair:

Prof. Pavithra Prabhakar

Prof. Luca Zaccarian

Date: July 8-10, 2024

Tentative deadline: January 15, 2024

Some NAHS papers have the option of presenting at ADHS 2024.

Announcement

CDC 2022 tutorial session entitled "Recent Advances in Data-driven Control: Concepts, Theory, and Applications"

Date and Time: Tuesday 13:30-15:30

Location: TuBT12

Organizers: Alexandre S. Bazanella and Frank Allgöwer

Announcement

CDC 2022 tutorial session entitled "Cybersecurity and Supervisory Control: Synthesis of Attacks and of Defense Strategies using Discrete Event Systems Techniques"

Date and Time: Wednesday 13:30-15:30

Location: WeBT12

Organizers: Stephane Lafortune, Christoforos N. Hadjicostis, Feng Lin, and Rong Su

Announcement

International Graduate School on Control:

- Multi-Agent Control under Spatiotemporal Logic Constraints
  - By Lars Lindemann and Dimos V. Dimarogonas
  - Date: 22/05/2023-26/05/2023
  - Place: Delft, The Netherlands

- Hybrid Control Systems
  - By Ricardo G. Sanfelice
  - Date: 27/03/2023-31/03/2023
  - Place: LUCCA, Italy

Announcement

IEEE Control Systems Letters Special Issue on "Data-driven analysis and control"

Guest Editors:

- Kanat Camlibel, Groningen University, The Netherlands

- Martin Guay, Queen's University, Canada

- Sophie Tarbouriech, LAAS-CNRS, Toulouse, France

- Harry Trentelman, Groningen University, The Netherlands

- Deadline: December 10, 2022

Announcement

26th ACM International Conference on Hybrid Systems: Computation and Control

PC chairs: Ricardo Sanfelice and Dejan Nickovic

Date: 9-12 May, 2023

Place: San Antonio, TX, USA

Final Remarks and Summary

- Other items?

- Opportunities for involvement in proposed TC activities and to start new ones

- Let's use funding available through CSS (3K/year)

- Next meeting at the American Control Conference 2023 in San Diego

Thank you for your support and participation!