**Report on Discussions**

***Joint Workshop ETH &
Multi-hazard Engineering Collaboratory for Hybrid Simulation:***

*New Frontiers and Innovative Methods*

Workshop held March 13-15, 2019
at the ETH Zurich, Switzerland

**Summary**

Our increasingly interconnected communities rely on resilient strategies to maintain steady operation. However, resilient infrastructure requires that we strive to obtain a deeper understanding of the salient behaviors and uncertainties present when structures are exposed to hazardous loading conditions. The growing prevalence of virtual testing as a replacement for physical experimentation also drives the need for mathematical models of such systems. When structural systems are too large of complex to test in the laboratory, the cyber-physical testing method known as hybrid simulation (HS), a.k.a. dynamic virtualization, provides an important tool for their examination. HS has great potential to increase our expectations regarding standard engineering practices, but engineers and researchers should be able to run HS without needing the advanced skills of developers. Furthermore, synergetic efforts are needed to develop a new generation of HS platforms with which multi-hazard scenarios can be investigated as we aim to provide rigorous solutions to future infrastructure challenges.

The objectives of this joint ETH-MECHS workshop were to establish a vision for future research and to identify best practices for the field of HS. The workshop was organized as a series of presentations mixed with discussions about the scientific challenges and opportunities that will motivate transformative advances in this versatile class of methods. Attendees learned about both the basics and leading-edge developments of the method, aiming to build capacity at more laboratories around the world. Another significant goal was to bring together a diverse group of international researchers to spark new collaborative opportunities.

The 2nd MECHS Workshop “New Frontiers and Innovative Methods” was held on March 13-15, 2019 in Zurich, Switzerland in partnership with researchers at ETH. A group of 35 researchers participated, including multi-hazard engineering researchers, graduate students, international partners and interdisciplinary collaborators. This report provides a summary of those discussions.

See the MECHS page for more activities and resources: <http://mechs.designsafe-ci.org>

|  |  |
| --- | --- |
|  | The Research Coordination Network in Hybrid Simulation for Multi-hazard Engineering is supported by a grant from the National Science Foundation (CMMI#1661621). |

**Introduction**

The 1st MECHS Workshop titled “Breaking Barriers and Building Capacity” was held on December 12-13, 2017 at the University of California, San Diego.

**I will write this.**

**Discussion Group A— New Frontiers**

**Co-Chairs:** Name (*Affiliation*)

 Name (*Affiliation*)

**Recorder:** Name (*Affiliation*)

**Participants/Affiliations:**

|  |
| --- |
| Name (*Affiliation*) |
| Name (*Affiliation*) |
| Name (*Affiliation*) |
| Name (*Affiliation*) |
| Name (*Affiliation*) |
| Name (*Affiliation*) |
| Name (*Affiliation*) |

The objectives of this working group were to <fill in with an appropriate statement>

# **Main Points of Discussion**

<Short intro statement about actual discussion topics covered in the group>

***Subtitle Topic***

Summarize this topic in a few paragraphs

***Subtitle Topic***

Summarize this topic in a few paragraphs

***Subtitle Topic***

Summarize this topic in a few paragraphs

# **Action Items and Future Research Needs**

* <item>
* <item>
* <item>
* <item>
* <item>