



INTERNATIONAL SOCIETY FOR STRUCTURAL HEALTH MONITORING OF INTELLIGENT INFRASTRUCTURE

# January 2013 ISHMII Membership Notes

Vol. 3 Issue 1

## President's Letter

Dear Society Members and Colleagues,

The ISHMII.org [Knowledge and Education Center](#) contains thousands of pages of proceedings from 10 official or sponsored conferences and workshops held since 2003, all informative sources for CSHM research. Together with the [Journal of Civil Structural Health Monitoring](#) and our biennial electronic publication, [The Monitor](#), these are benefits of ISHMII membership that are accessible through our [Society Web site](#). I encourage you to use these proceedings as a source of research and to build coalitions with other ISHMII members.



I am struck by the significance of the research in all of the SHMII proceedings, and more recently in reading the proceedings from SHMII-5 (2011) and CSHM-4 (2012). The range of topics is immense and thorough, covering fully the growing variety of work that we perform and the vast potential for application. It is an introduction to new findings and exciting future areas.

When we organized our first workshop in 2004<sup>1</sup>, our aim was to establish an international forum to discuss issues related to sensors in CSHM. The *1st North American Euro-Pacific Workshop for Sensing Issues in Civil Structural Health Monitoring* (CSHM-1), November 2004, Oahu, Hawaii, was a committed effort to assess the status of the field with emphasis on sensor attributes and placement, reliability for long-term monitoring and standards and specifications. What is interesting from CSHM-1 was that the results of the committee discussions resulted in the development of a simple “sensing needs” table. Since then, that table, *Relationship between effects of events on structural safety and measurable attributes of structures*, has been used in SHM books and journal publications. The committee report from CSHM-1 can be downloaded from the ISHMII proceedings.

By the time that we held the 2<sup>nd</sup> *International Conference on Structural Health Monitoring of Intelligent Infrastructure* (SHMII-2), in November 2005 in Shenzhen, China, we knew how attractive and challenging SHM was as an area in which high technologies, including smart

sensors, wireless sensor networks, signal acquisition and processing, real-time data mining, transferring and management were integrated. As the editors of those proceedings J.P. Ou, H. Li and Z.D. Duan wrote of SHM, “it is a concrete embodiment of modern testing technology as monitored infrastructure forms a long-term, full-scale and real-time testing system... it is a trend representing the integration, innovation and multi-disciplinary crossovers in civil engineering.” We have come far since then. This is through the efforts of our Society members: researchers, scientists, engineers, entrepreneurs, students, and private and public agency managers of the massive civil structures that mark our industry and the progress of society. All have contributed to this rich compilation of educational and research material.



6TH INTERNATIONAL CONFERENCE  
ON STRUCTURAL HEALTH MONITORING  
OF INTELLIGENT INFRASTRUCTURE  
9-11 DEC 2013 | HONG KONG



IMPORTANT ANNOUNCEMENT: AUG 22 (EXTENDED) - EARLY-BIRD REGISTRATION DEADLINE

We are now approaching [SHMII-6 \(2013\)](#), in Hong Kong in December 2013, and are accepting abstracts for review. We invite you to submit abstracts by March 15, 2013 to [shmii6.2013@polyu.edu.hk](mailto:shmii6.2013@polyu.edu.hk).

The research papers presented over the years explore ideas about the state-of-the-art, state-of-the-practice and future trends in smart sensors, advanced sensor networks and integrated systems for SHM of intelligent infrastructures. Together, we are a vast intellectual and practical community dedicated to the advancement of CSHM. We are concerned about quantification of damage and development of tools for the government agencies for efficient safe guarding of the infrastructure system.

Many of us focus on massive civil structures that require extensive resources to manage and inspect – the bridges that are spanning greater distances every year and require smart materials, and tunnels and roadways that link communities. Others imagine and construct futuristic buildings, taller and more stable against the elements than ever before.

*Burj Al Arab Hotel, Dubai, UAE*



Some work to preserve the iconic structures that are classic features of our cities; our communities have had the privilege of monitoring and preserving many of the heritage structures in Europe, Asia, and the North America. Examples include the Parliament Building in Ottawa, Canada<sup>2</sup>, the Brooklyn Bridge (pictured to the left) in New York City, USA and many others.



*Canadian Parliament Buildings*

Let me give one example of how a Padova-based team used advanced technologies to extend the life of the 1st century AD Roman Arena in Verona, Italy. I invite you to read their research in depth from the proceedings of CSHM-4 (2012)<sup>3</sup>.



The Arena, used by about a half million people yearly for theatrical performances and rock concerts is both ancient and in an earthquake zone. It has survived floods, wars and sieges. Our colleagues installed displacement sensors to evaluate its structural response to static, dynamic and seismic loads in order to determine the reversibility of the natural displacements or deformations that might damage this monument as well as endangerment to the spectators. By using numerical models, they defined the relevant modal parameters and installed accelerometers where they knew to expect significant dynamic amplifications. The Italian research team used the results to fine tune the finite element model and to better understand the



structural response of the Arena. This work was significant to assess the operational conditions and for prediction of safety conditions, especially given the chance of a major earthquake.

Looking to the future, Katerina Krebber's SHMII-5 (2011) keynote address on SHM highlights the use of fiber optic sensors to create smart technical textiles that interact with their environment. They will, she notes, "sense and react to environmental conditions and external stimuli from mechanical, thermal, chemical or other sources" becoming multifunctional or even "intelligent" depending on the variety of sensors installed in the textiles.<sup>4</sup> We can easily foresee the applications of smart textiles for many measurement categories. According to Krebber with minimal modifications to some of the textile production machines, optical fibers can be processed in a manner similar to standard textile yarns.



*Integration of POF into nonwoven geotextiles*

These are two glimpses into SHMII-5 and CSHM-4 proceedings. The citations for the papers referred to here appear below.

ISHMII and its publications is a forum for the international community. I encourage you to make certain that [your membership is renewed](#) every year or that you [join ISHMII](#).

With warm wishes,

*Farhad Ansari*, President

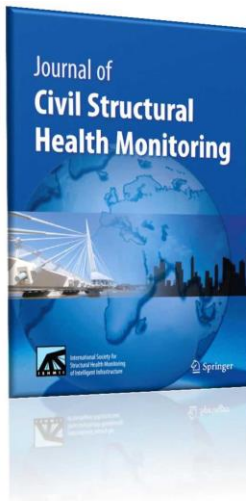
[FAnsari@uic.edu](mailto:FAnsari@uic.edu)

<sup>1</sup> (2005) *Sensing Issues in Civil Structural Health Monitoring*. Ansari F. Ed. Springer. 2005. 527 pages.

<sup>2</sup> (2010) 3rd International Workshop on Civil Structural Health Monitoring (**CSHM-3**), August 2010, Ottawa-Gatineau, Canada, *Aseismic Performance of Rehabilitated Heritage Stone Structures in Canada*, A. Elmenhaw, University of Calgary, M. Sorour, University of Calgary, D. Duchesne, Public Works and Government Services, Canada, J. Paquette, Public Works and Government Services, Canada, A. Mufti, University of Manitoba, L. Jaeger, Dalhousie University, N. Shrive, University of Calgary, Proceedings, Page 225.

<sup>3</sup> (2012) 4th International Workshop on Civil Structural Health Monitoring (CSHM-4), November 2012, Berlin, Germany, *Structural Health Monitoring of the Roman Arena of Verona*, Italy, F. Casarin, University of Padova, Italy; E. Bello, IRS, Padova, Italy; F. da Porto, F. Lorenzoni, C. Modena, University of Padova, Italy, Proceedings, Session 1.

<sup>4</sup> (2011) 5th International Conference on Structural health Monitoring of Intelligent Infrastructure (SHMII-5), December 2011, Cancun, Mexico, *Structural Health Monitoring by Smart Technical Textiles Based on Fiber Optic Sensors*, K. Krebber, Proceedings, Keynote Address.



Follow-up with your CSHM research.

Submit your research papers to the *Journal of Civil Structural Health Monitoring*, a peer-review Journal, through the [JCSHM Editorial Manager](#)

*Volume 2, Number 3-4, December 2012 is available to ISHMII members who have logged in to their account at [ISHMII.org](http://ISHMII.org).*



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I S H M I I

2013 Membership Renewals Now Being Accepted

## WORKSHOPS AND CONFERENCES

2013



**MoDeRn International  
Conference and Workshop,  
Luxembourg  
March 19-21, 2013**

[International Conference and  
Workshop - Monitoring in Geological  
Disposal of Radioactive Waste.](#)



**7NSC 2013  
Oakland, California  
May 20-22, 2013**

[7th National Seismic Conference on  
Bridges & Highways](#)

Additional information is also available from  
Jerome O'Connor, P.E., Conference  
Coordinator at [conf7NSC@buffalo.edu](mailto:conf7NSC@buffalo.edu).

***ISHMII is Proud to be an  
Outreach Partner of 7NSC.***

**CALLS FOR PAPERS**



**SHMII-6 Hong Kong  
December 9-11 2013**

**ISHMII invites you to attend the 6th  
International Conference on Structural  
Health Monitoring of Intelligent  
Infrastructure**

**[FIRST CALL FOR PAPERS](#)**

SHMII-6 2013 is organized by the Department of  
Civil and Structural Engineering, The Hong Kong  
Polytechnic University.

**Details are available at**

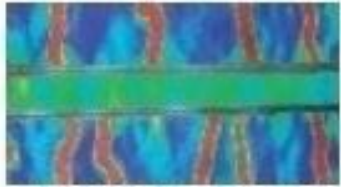
[www.cee.polyu.edu.hk/shmii-  
6/home.html](http://www.cee.polyu.edu.hk/shmii-6/home.html)

**CREDITS AND APPRECIATION**

ISHMII extends its thanks to those who make photos and  
graphics available.

Photograph of Burj al Arab Hotel is found at [www.e-architect.co.uk/images/jpgs/dubai/burj\\_al\\_arab\\_atkins271008\\_2.jpg](http://www.e-architect.co.uk/images/jpgs/dubai/burj_al_arab_atkins271008_2.jpg).

Photograph of the Roman Amphitheater,  
Verona\_Arena.jpg, is found at [www.parrocchiafarra.it](http://www.parrocchiafarra.it).



**SMAR 2013**

**SMAR 2013  
Istanbul, Turkey  
September 9-11, 2013**

2nd Conference on Smart Monitoring,  
Assessment and Rehabilitation of Civil  
Structures.

**FiberSensing**

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Civil Engineering, Energy and  
Aerospace Industries.**

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Photograph of Canadian Parliament buildings by Kenton Smith if located at [www.picturesocial.com/photo/canada-parliament-buildings?](http://www.picturesocial.com/photo/canada-parliament-buildings?).

Photograph of Brooklyn Bridge, Brooklyn\_bridge\_ny.jpg, is found at [mojotravel.wordpress.com](http://mojotravel.wordpress.com).

Photographs of the integration of POF into nonwoven geotextiles provided by Katerina Krebber.

## **CONTACT ISHMII**

[www.ISHMII.org](http://www.ISHMII.org)

### ISHMII President

**Farhad Ansari, Ph.D.  
University of Illinois at Chicago  
Civil & Materials Engineering  
(MC 246)  
842 W. Taylor Street  
Chicago, Illinois 60607-7023  
USA  
[FAnsari@uic.edu](mailto:FAnsari@uic.edu)**

### ISHMII Administrative Centre

**University of Manitoba  
Agricultural & Civil Engineering Bldg.  
A250 - 96 Dafoe Road  
Winnipeg, Manitoba R3T 2N2  
Canada**



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*Membership Notes* and *The Monitor* are delivered to members and colleagues. Your colleagues can receive both for free.

Refer them to or forward contact information to [NancyC@ishmii.org](mailto:NancyC@ishmii.org).  
Your comments on *Membership Notes* are welcome.