



# Experimentally Speaking...

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## MESSAGE FROM THE PRESIDENT



Wendy Crone, SEM President, 2018-2019

In my summer message published in *Experimentally Speaking*, I talked about some of the ideals that I believe embody what makes our society so special. Namely, how we value friendly and inclusive interactions, promote collaboration, and support the development of our early career members, while holding high standards and advancing the field of mechanics. Much of this happens through the mentoring that occurs at meetings and between our members outside of meetings.

You might only associate mentoring with the traditional mentor-mentee dyad, but research shows that having a “constellation” of mentors will increase your overall career success. Whether in interaction with students, junior colleagues or peers, all of us engage in mentoring others at various durations and depths on a range of topics even if we don’t formally call it mentoring. We help each other, give advice, and promote a colleague’s work.

We can all benefit from mentoring, not only at early career stages, but also as we navigate career transitions and life changes that impact our work. In my own case, I can recall the influence of past mentors on my career trajectory, the balance I sought with personal and professional responsibilities, the productivity and visibility of my research, and the techniques I brought to the classroom in teaching, just to name a few.

Others may not know when we would benefit from advice, so it is also important to recognize when to reach out and seek it. You will also want to consider the breadth of people in your network who might be

able to provide you with the mentoring you need. I expect that you have already found your SEM network to be an excellent resource. It is certainly one that I have benefited from and appreciated over my career (thank you to all my mentors). Please try to reciprocate by providing mentoring to others when they need the advice and experience you are able to share! These individuals will become the future leaders in our discipline and our professional society.

With respect to SEM news, I am pleased to introduce Nuno Lopes in his new role as Managing Director of the Society. Many of you already know Nuno from his prior years of work with SEM and it has been a pleasure to work with him in this new capacity. When you see him at an upcoming IMAC or Annual meeting, please congratulate him!

I am also happy to announce the appointment of Mike Mains as our new IMAC conference director. This is also an opportunity to thank Al Wicks and acknowledge his 36 years of leadership with IMAC -- an incredible contribution!

I look forward to seeing many of you at IMAC!

Wendy Crone  
SEM President

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# FROM THE EXECUTIVE DIRECTOR

With this message, I would like to highlight a few exciting management and personnel updates that have occurred during the year.

I mentioned in the August newsletter the promotion of Nuno Lopes to Managing Director of SEM. Nuno has been working closely with me in his new role and will be reaching out to many of you directly in the future with SEM updates as we launch a few new website/membership communication tools.

SEM also welcomes Kathryn MacAulay as our new office assistant. Kathryn will be working closely with Jen and Shari supporting conference, exhibits and membership activities.

Another management update is the appointment of Mike Mains as our new IMAC Conference Director 2018-2021. Mike is currently working for Brüel & Kjær North America in the Applications Solutions-Structural Analysis area and is the Chair of SEM's Modal Analysis/Dynamic Systems Technical Division. Mike's tenure with SEM/IMAC spans over 10 years with leadership roles including the SEM Executive Board, IMAC Advisory Board and various conference technical programming activities. SEM is thrilled to welcome Mike to his new role. Please feel free to communicate with Mike regarding areas of emerging growth for IMAC.

I also want to take this opportunity to send a special thank you to Al Wicks for his leadership in IMAC since its first conference 36 years ago and as Conference Director since 1995. In February 2018, Al asked to step down from his role as IMAC Conference Director. The IMAC Advisory Board leadership worked together to update the conference operational documents in order to codify the progression and succession plans to be sure that the role of conference director would not only be filled in an appropriate manner, but with an individual that had played a leadership role in guiding the planning of the technical program for IMAC. As mentioned, Mike Mains will replace Al Wicks beginning now. In 2021, the current Chair of the IMAC Advisory Board, David Epp, will become the new IMAC Conference Director.

Al Wicks has kept Dick DeMichele's vision of IMAC front and center as documented below from one of Al's IMAC conference program welcome statements:

*One of the unique attributes of IMAC, nurtured over the years, is the mix of analytical and experimental topics, bringing the analyst and the experimentalist together as a team. The traditional barriers have been removed to foster constructive dialogue between academics, industry and the government labs. It is from these meetings, that technologies are shared, enhancing our industries, infrastructure, our educational endeavors and improving society in general. As lofty as it sounds, IMAC remains a friendly conference where exhibitors, presenters and attendees spend several days exchanging the ideas that fuel the coming year. We welcome all to IMAC to share in the vision of Dick DeMichele.*

Al has given tirelessly of his time over the past 36 years to be sure that the guiding principles and vision of IMAC stayed strongly at the foundation of IMAC's growth. The new tag line, "It's not just modal anymore," is case in point that the IMAC community has kept its finger on the pulse of the emerging areas complemented by the expertise of our IMAC conference attendees. SEM is indebted to Al and very grateful for his years of leadership and service.

Please visit the SEM website to view the complete list of SEM and IMAC leadership, go to <https://sem.org/governance>.

I look forward to your questions and comments so please don't hesitate to email or call.



Kristin Zimmerman,  
Executive Director

# IMAC XXXVII

## IT'S NOT JUST MODAL ANYMORE

IMAC has become the all-inclusive meeting on a wide-ranging set of technologies within the field of structural dynamics. I think we can all agree that 'It's not just Modal anymore'. This broad focus on structural dynamics includes topics in simulation and modeling, nonlinear dynamics, sensors, signal processing and control spanning the full range of engineering disciplines. At this conference you will find the products, presentations and tutorials required to move your research and technology interests forward, whether you are from industry, academia or a national laboratory. At this conference you will find a technical program that is rich in content and an exhibition of products and services that supports the field of structural dynamics.

While IMAC's origins initially focused heavily on the field of Experimental Modal Analysis, you will now find a mix of analytical and experimental topics. Traditional barriers are being removed, fostering constructive dialog between analyst and experimentalist, and between academics, government laboratories and industry. Our supporting organization, the Society for Experimental Mechanics (SEM), is often recognized as 'the friendly society'. I know you will find our conference to also be friendly, where exhibitors, presenters and attendees spend several days exchanging the information and innovation that fuel the research and work for the coming year.

Take advantage of our pre-conference courses:

Sunday, January 27, 2019 | 9:00AM - 5:00PM

### **Bayesian Model Updating and Uncertainty Quantification: Theory, Computational Tools, and Applications**

Prof. Costas Papadimitriou—University of Thessaly

Prof. Babak Moaveni—Tufts University

#### **Course Description**

In simulations of complex physical systems, uncertainties arise from imperfections in the mathematical models introduced to represent the systems and their interactions with the environment. Such uncertainties lead to significant uncertainties in the predictions using simulations. Since such predictions form the basis for making decisions, the knowledge of these uncertainties is very important. The course will present the Bayesian model updating framework, the associated computational tools, and selected applications, along with the main challenges for quantifying and propagating uncertainties in complex structural dynamic simulations.

This is a hands-on course where participants will program their Matlab code for Bayesian model inversion using Markov Chain Monte Carlo sampling techniques.

Sunday, January 27, 2019 | 1:00PM - 5:00PM

### **Quantifying Human-Infrastructure Interfaces for Decisions: Theory, Applications, and Hands-on Experiments using Data**

Fernando Moreu—University of New Mexico

Haeyoung Noh—Carnegie Mellon University

#### **Course Description**

To date, new technologies collecting data of the built environment are cheaper, more accurate, diverse, and accessible than ever before. However, the use and implementation of the new tools available to structural engineers to assess, inspect, or inform decisions about their built environment and its interaction with humans have been very limited. Some examples include the cases of decision-makers, owners of infrastructure, policy makers, occupants, and inspectors of infrastructure. They are often not taken into account when developing new technologies to better inform humans' decisions about the structural response or their condition. By empowering human-machine interfaces in the context of the built environment and fostering human involvement and participation (human-in-the-loop), we will explore specifically how the collection of data, their analysis, and their interpretation can inform human decisions.

This course will present advantages of using new simplified and accessible sensing and data acquisition platforms to measure simple responses of structures and algorithms to identify changes on damage and performance using quantitative data analysis. The students will learn the state-of-the-art of human-infrastructure interface and human performance monitoring, new theoretical and practical implementations of technology to sense the built environment that is human-centered, and social and institutional centered data acquisition where the human perception and their decisions are augmented through quantification.

# IMAC - THANK YOU AND WELCOME



*Al Wicks*

If you've attended an IMAC, you've run into Al or maybe he's run past you in the early morning hours. Alfred Wicks, Al as he's known to most of us, has been a faculty member at Virginia Polytechnic Institute and State University for the last 30 years performing research in autonomous systems and pediatric medical devices.

Al graciously took on the challenge of Conference Director for IMAC in 1995 and on behalf of all of us at the Society for Experimental Mechanics, and of all the attendees throughout the years, we extend a sincere and much deserved thank you for his time, dedication and efforts.

The IMAC Conference was created by Dick DeMichele and Peter Juhl. The first IMAC was held in 1982. Al continued their vision and contributed to the success of each subsequent conference.

During the initial planning for IMAC, the organizers sought the support and advice of leading US and international individuals working in the field of modal testing and analysis. These selected individuals then became the IMAC Advisory Board in 1982. Their function was to provide the IMAC staff advice, suggestions and support in the planning, promotion and administration of the technical program for the Conference.

In 1995 Dick DeMichele resigned as IMAC Technical Director and Al Wicks, who had worked closely with Dick for a number of years, assumed the position. Al has been the face of IMAC for many of us and will be missed in his role. All of us wish you continued success in your career and research.



*Mike Mains*  
IMAC Conference Director

Just as Dick DeMichele passed the torch to Al Wicks, he now passes the torch to our new IMAC Conference Director, Michael Mains.

Mike has been involved in IMAC since the early 1990s as a student at the University of Cincinnati. He has been a member of the Society for the last 14 years and is currently the chair of the Modal Analysis and Dynamic Systems Technical Division.

Mike received his B.S and M.S in Mechanical Engineering from the University of Cincinnati in 1990 and 1994, respectively. He joined Brüel & Kjær as a Senior Software Developer in the winter of 2004. During his employment with Brüel & Kjær he has had the opportunity to work on many software projects related to Structural Dynamics, Modal Analysis Modal Vector Correlation and Signal Processing.

Besides chairing one of our Technical Divisions, Mike has been a member of SEM's executive board and he has also been active in the "Basics of Modal Analysis for the New/Young Engineer" sessions at IMAC, a series of lectures, tutorials and vendor presentations designed for first time IMAC attendees and those attendees returning from an extended absence from IMAC.

This fall, Mike joined the faculty of the University of Cincinnati as an Adjunct Professor, teaching Automotive Design I & II. This is a Senior Level Design course sequence that supports the UC Formula SAE Team, a continuation of the Bearcat Motorsports activity that began in the early 1990s.

It is with great pleasure that we, at SEM, welcome Mike Mains to his new role as IMAC Conference Director. We encourage you to welcome Mike at our upcoming Conference in Orlando, Florida and to support his efforts in making this IMAC a success, like those IMACs that have preceded it.

If you would like to get more involved in efforts to support Mike Mains, or IMAC, please speak to members of the IMAC Advisory Board and to find out how. A listing can be found at <https://sem.org/IMACadvisoryboard>.

Nuno Lopes,  
Managing Director

# UPCOMING EVENTS

## 2019

### IMAC-XXXVII

#### IT'S NOT JUST MODAL ANYMORE

**JANUARY 28-31, 2019**

**ROSEN PLAZA HOTEL**

Orlando, FL USA

#### PRE-CONFERENCE COURSES

Sunday, January 27, 2019

Bayesian Model Updating and Uncertainty Quantification:  
Theory, Computational Tools, and Applications  
9:00AM - 5:00PM

*Prof. Costas Papadimitriou—University of Thessaly*

*Prof. Babak Moaveni—Tufts University*

Quantifying Human-Infrastructure Interfaces for Decisions:  
Theory, Applications, and Hands-on Experiments using Data  
1:00PM - 5:00PM

*Fernando Moreu—University of New Mexico*

*Haeyoung Noh—Carnegie Mellon University*

### 2019 SEM ANNUAL

**JUNE 3-6, 2019**

**PEPPERMILL RESORT**

Reno, NV USA

### IDICS 2019

**OCTOBER 14-17, 2019**

**DOUBLETREE BY HILTON**

Portland, Oregon

## 2020

### IMAC-XXXVIII

**FEBRUARY 10-13, 2020**

**HYATT REGENCY HOUSTON**

Houston, TX USA

### XIV SEM INTERNATIONAL CONGRESS

**JUNE 7-11, 2020**

**ROSEN PLAZA HOTEL**

Orlando, FL USA

To explore these events and others SEM and its partners are planning, please go to [sem.org](http://sem.org) for more information.