



Experimentally Speaking ...

<http://sem.org>

Volume 3 | Issue 1

March | 2012

Message from the President

The International Modal Analysis Conference, or IMAC, is a strong component of the Society for Experimental Mechanics. The 2012 IMAC Conference and Exposition on Structural Dynamics held in Jacksonville, Florida marked its 30th anniversary! The conference spanned 5 days, starting on Sunday, January 28th and ended on Thursday, February 2. There were nearly 300 papers presented in 63 sessions. Additionally, this year, we had a particularly strong Exhibition featuring 35 vendors exhibiting their latest in application hardware, instrumentation, and software. I would like to thank Al

Wicks from Virginia Tech and the other conference organizers for putting together a strong program. I would also like to thank the SEM staff for their tireless effort to organize and oversee this event.

As in previous years the conference kicked off with Sunday short courses. This year there were four addressing: 1) Modal Analysis: Theory and Application (by David Brown, Randy Allemang and Peter Avitable), 2) Noise and Vibration Analysis with Matlab®/Octave Examples (by Anders Brandt), 3) Operational Modal Analysis: Background, Theory and Practice (by Svend Gade and Carlos Ventura), 4) Theoretical and Experimental Modal Analysis of Nonlinear Mechanical Systems (by Gaetan Kershen, and Alexander Vakakis).

On Monday, the conference commenced with the annual Plenary Lecture given by Professor Daniel Inman from the University of Michigan. The title of his talk was "What Happened to 30 Years of IMAC Papers?" The talk traced 30 years of IMAC papers and the research they spawned. This year's honorary session (Tuesday) was dedicated to Professor David Ewins.

The technical program consisted of sessions on nonlinear systems, experimental dynamics substructuring, civil structures testing, basics of modal



Peter G. Ifju, SEM President, 2011-2012

analysis for new/young engineers, damping of materials and members, sensors and instrumentation, info-gap analysis and design of structures, Bayesian and Markov chain Monte Carlo methods, wind turbine dynamics, acoustic fluid-structure interaction of cars and ships. I would like to thank all the session organizers and chairs for putting together a high quality conference.

In other news, I am delighted to announce that Correlated Solutions Inc. has just established an endowment to fund the educational mission of our society. They have committed to donate

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IMAC-XXX

International Conference & Exposition on Structural Dynamics
February 2012 • Jacksonville, FL, USA

Some highlights from another successful IMAC:



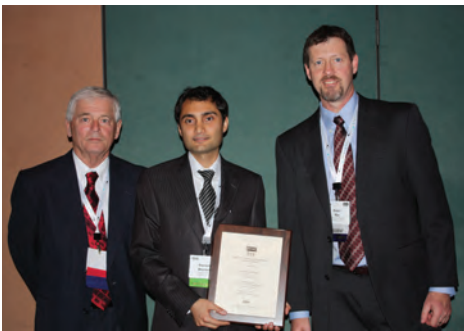
IMAC Conference Chair Al Wicks, Raj Singhal - recipient of the D.J. DeMichele Award, and Peter Ifju - SEM President



Randall Allemang - 25 year SEM member, and Peter Ifju



Father and son attendees Carlton and James Ackers



Al Wicks, Siavash Dorvash - recipient of the D.J. DeMichele Scholarship, and Peter Ifju



Daniel Inman - IMAC Plenary Speaker, and David J. Ewins - subject of the IMAC Honorary Session



Left to Right Umut Tabak, Sven Voormeeren, Bastiaan Pieter Nortier, Michael Kirschneck, Maarten van der Seijs, Paul van der Valk, and Daniel Rixen

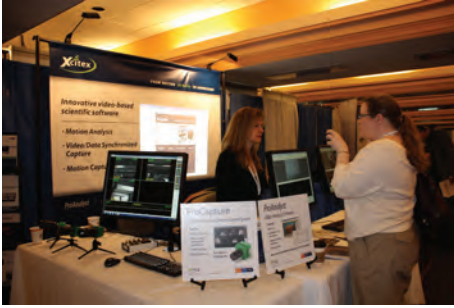


John Mc Farland - of the MVUQ TD, Lucas Horta - recipient of the MVUQ Best Paper Award, and Peter Ifju



Ralph Brillhart, Tom Carne, Bruce LeBlanc, and Dave Hunt

Conference attendees enjoyed discussing the latest technologies with IMAC Exhibitors:



Leah Holber of Xcitex



Eric Roulo, SMS, Siemens PLM Solutions partner



Alistair Tofts of Correlated Solutions



Russell Zuppo and Steven Johnson of Data Physics Corporation



Steve Moss of Diversified Technical Systems



Steve Astulfi of Tritex/TEAC Data Records



Brüel & Kjær's booth, one of the many exciting exhibits



Demonstration session of *Basics of Modal Analysis for the New/Young Engineer* in the Technology Center

THANK YOU to our Sponsors

Our sincere gratitude goes to the following Exhibitors for their various IMAC-XXX sponsorships:

Brüel & Kjær 
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Wolf Star Technologies, LLC - New SEM Corporate Member

New SEM Corporate Member Wolf Star Technologies is committed to helping their clients realize their product development goals by leveraging the strengths of FEA analysis. Wolf Star Technologies offers consulting services to assist with delivering decision ready solutions for clients' projects.

Wolf Star Technologies offers truly unique software solutions (True-

QSE™, True-Load™ and True-LDE™) available nowhere else in the FEA industry. These solutions are seamlessly integrated into the Abaqus CAE environment, to better leverage customers' investment in Abaqus. The Wolf Star Technologies suite of software tools enables analysis driven product development by focusing on test correlation, quasi-statics and linear dynamics.

Wolf Star Technologies has formed strategic alliances with Dassault Systems and Safe Technology. Safe Technology offers their flagship product, True-Load™, under the brand name fe-safe/True-Load™. These alliance partnerships provide them with a global presence.

SEM XII International Congress & Exposition on Experimental & Applied Mechanics Measurement Challenges for New Structures and Materials June 11-14, 2012 • Hilton Orange County/Costa Mesa

Location

Hilton Orange County/Costa Mesa

3050 Bristol Street, Costa Mesa, CA 92626
tel: (714) 540-7000
fax: (714) 540-9176
www.orangecountycostamesa.hilton.com
Rates: single/double \$139+, triple \$149+,
quad \$159+ (Taxes currently 11.11%)

Tracks & Symposia

Dynamic Behavior of Materials
Challenges in Mechanics of Time-dependent Materials and Processes in Conventional and Multifunctional Materials
Imaging Methods for Novel Materials and Challenging Applications
Experimental and Applied Mechanics
2nd International Symposium on the Mechanics of Biological Systems and Materials
13th International Symposium on MEMS and Nanotechnology
1st International Symposium on Joining Technologies for Composites

Exposition

If your company is interested in exhibiting at the SEM XII International Congress & Exposition, please contact Joni Normandin:
Phone 203.790.6373, Email joninormandin007@aol.com.

Complete details: <http://sem.org>

2012-13 IMAC Advisory Board Members

Conference Director Alfred L. Wicks



Dr. Wicks received his Ph.D. from Michigan Tech University. Dr. Wicks was a co-founder of Stress Technology Inc and Vibration Analysis Inc. Since joining the

faculty of the Mechanical Engineering Department at Virginia Tech in 1986, Dr. Wicks has developed numerous techniques for applying scanning laser technology to dynamics measurements. He has taught numerous courses on signal processing, instrumentation, modal analysis and vibrations. Current funded research in unmanned systems involves sensing technologies, navigation strategies, and wireless communications

Using his expertise in signal processing and instrumentation, he was the co-leader the DARPA Grand Challenge team in 2004 from Virginia Tech through qualifying to the 5th position in Barstow. During the second Grand Challenge Dr. Wicks was the team leader for Team Rocky placing 9th with at Primm NV. In the Urban Challenge, the Virginia Tech team finished 3rd. He is also served the Technical Chairman of the International Modal Analysis Conference for the last 13 years.

Assisted by Raj K. Singhal



Raj K. Singhal received his BSc in Mechanical Engineering (with Honours) from the Panjab University in India (1970), his MEng in Mechanical Engineering (with

Distinction) from the Indian Institute of Science, Bangalore (1973), and his Ph.D.

in Mechanical Engineering from the University of Saskatchewan, Canada (1986), where his Ph.D. research work was on Vibrational Behaviour of Stators of Electrical Machines. He has published in reputed journals and presented at international conferences numerous papers in these areas: static/dynamic analysis of structures including vibration of membranes, plates, and shells; modal analysis; system identification; experimental vibration and modal analysis; static load testing; mass properties measurements; and photogrammetric/non-contact measurements. Dr. Singhal is coreipient of 2002 Canadian Astronautics and Space Institute's A. J. Saber Award for Best paper on Astronautics or related topics "Force Limited Vibration Testing Applied to the FTS Instrument of SCISAT-1". He held the position of an Adjunct Research Professor in the Department of Mechanical and Aerospace Engineering, Carleton University, Ottawa for the period July 1993 to July 1996. He has been an Adjunct Professor, Department of Mechanical Engineering, University of Ottawa since 1998. He has and still serves as Technical Committee Member and as Session Chair for several international conferences. Currently he is Manager, Structural Qualification Facilities (vibration, shock, modal, static load testing, mass properties, and photogrammetry measurements) at the Canadian Space Agency's David Florida Laboratory (DFL). The DFL is Canada's world-class facility for the assembly, integration, and environmental testing of space and non-aerospace hardware for both national and international companies and organizations.

Future Conference Committee

François M. Hemez



Dr. Hemez has been Technical Staff Member at Los Alamos National Laboratory since 1997. He was a member of the Weapon Response

group for seven years; served as its Validation Methods team leader for one year; and is currently with X-Division. He manages the code verification project of the Advanced Scientific Computing program and contributes to the development and application of Verification and Validation (V&V), uncertainty quantification, and decision-making for engineering, nuclear energy, and weapon physics projects. Before joining Los Alamos, François Hemez was a research associate of the French National Center for Scientific Research (CNRS), working in the area of test-analysis correlation and finite element model updating. Dr. Hemez chaired the Society for Experimental Mechanics (SEM) technical division on model validation and uncertainty quantification from 2005-2009; has served on the advisory board of the SEM International Modal Analysis Conference since 2006; and served on the SEM executive board from 2007-2009. He co-developed a short course on V&V and taught the first-ever V&V graduate course offered in a U.S. University (University of California San Diego, spring 2006). François Hemez received the Junior Research Award of the European Association of Structural Dynamics (2005); and two U.S. Department of Energy Defense Program Awards of Excellence for applying V&V to programmatic work at Los Alamos (2006). Dr. Hemez has authored over 270 publications and reports (including 21 peer-reviewed papers) since 1994.

Continued

David J. Ewins



David Ewins has spent the past 50 years studying and measuring vibration in a range of application areas - mostly in aerospace, defence and other hi-

tech industries (including the vibration isolation analysis of an interferometer at NPL in the 1970s). Having studied at Imperial College London and Cambridge University, he has been based at Imperial, throughout his career, and as Professor of Vibration Engineering since 1983, with periods as Visiting Professor overseas in the USA, France, Switzerland and Singapore. Following partial 'retirement' in 2005 (he still spends 1 day per week at Imperial), he now spends most of his time at Bristol University where he is Director of the £20M BLADE (Bristol Laboratory for Advanced Dynamics Engineering) laboratories and Director of the AgustaWestland UTC in Vibration Reduction.

His research has focused on two main areas - Modal Testing (and its applications) and Vibrations in Turbomachinery, in the latter case, working closely with Rolls-Royce since 1963. Current research priorities are (i) developing new test strategies to improve the effectiveness of vibration testing by an order of magnitude, including the development of new laser-based measurement techniques; (ii) properly accounting for the effects that structural joints have on the dynamics of engineering structures and (iii) incorporating robustness characteristics in dynamic analysis and design.

He founded the Dynamic Testing Agency in 1990 (now the Dynamics and Testing Working Group in NAFEMS), has published a textbook and many papers on Modal Testing, and a total of more than 300 papers on structural dynamics in general. He set up the first Rolls-Royce University Technology Centre (Vibration UTC) at Imperial College on 1990 and is currently setting

up the new AgustaWestland UTC in Vibration Reduction at Bristol University. Between these two projects, as the first Temasek Professor in Singapore (at Nanyang Technological University), he set up the Centre for the Mechanics of Microsystems (CMMS) between 1999-2002.

He is a Fellow of the Royal Society and of the Royal Academy of Engineering.

David Zimmerman



David C. Zimmerman earned his B.S., M.S. and Ph.D. from the State University of New York at Buffalo. In 1987, he joined the faculty of Aerospace Engineering,

Mechanics and Engineering Science at the University of Florida, Gainesville. He moved to the University of Houston in 1993, where he is currently a Professor of Mechanical Engineering. He was elected as a Fellow in the American Society of Mechanical Engineers in 2009. He has graduated 12 Ph.D. students and 31 M.S. students. With them, he has published 44 archival journal publications and 127 conference papers. Thirteen of his students have earned awards in student paper competitions.

Program Planning Committee

James P. DeClerck



Dr. James De Clerck is a Professor of Practice in the Mechanical Engineering - Engineering Mechanics Department at Michigan

Technological University. He received his Ph.D. in Engineering Mechanics in 1991. Prior to joining Michigan Tech in 2009, Jim was a Project Design Engineer at the General Motors Noise and Vibration Center in Milford, Michigan.

His areas of expertise include noise and vibration, structural dynamics, design, modal analysis, model validation, inverse methods applied to design, and advanced measurement techniques.

Christopher Niezrecki



Christopher Niezrecki is currently a Professor in the Department of Mechanical Engineering at the University of Massachusetts Lowell. He obtained dual B.S.

degrees in mechanical and electrical engineering from the University of Connecticut in 1991. In 1992 he obtained a M.S. degree in mechanical engineering from Virginia Tech and his Ph.D. in 1999 while working at the Center for Intelligent Materials Systems and Structures (CIMSS). He was the Director of the Smart Structures and Acoustics Laboratory at the University of Florida until 2004, is currently the Co-Director of the Structural Dynamic and Acoustic Systems Laboratory (<http://sda.sl.uml.edu/>), and leads the Wind Energy Research Group at UML (www.uml.edu/windenergy). Dr. Niezrecki has been directly involved in smart structures and noise and vibration control research for over 20 years, with more than 75 publications. He is the member of three separate conference executive committees pertaining to structural dynamics/smart structures. Areas of current research include: wind turbine blade dynamics, structural dynamic and acoustic systems, smart structures, controls, signal processing, structural health monitoring, bio-acoustics, and smart materials. Funding for his research (\$5.7M) has been provided by grants from NSF, DOE, ARO, ARL, ONR, AFRL, DOT, U.S. Army Natick Soldier Center, NCI, Florida DOT, Motorola, and Florida Fish and Wildlife Conservation Commission, Robert Bosch LLC, Univ. of Florida College of Veterinary Medicine. He is a member of ASME, SPIE, SEM, and the Acoustical Society of America.

Continued

Randall J. Allemang



Dr. Randall J. Allemang is a member of the faculty of the Mechanical Engineering Program, School of Dynamic Systems at the University of

Cincinnati, where he currently also serves as Director of the Structural Dynamics Research Laboratory (UC-SDRL). He has been actively involved in the area of experimental modal analysis at the University of Cincinnati, Structural Dynamics Research Lab for over thirty-five years, pioneering the use of multiple input, multiple output estimation of frequency response functions, developing the concept of cyclic averaging, formulating the modal assurance criterion (MAC), the enhanced frequency response function and reformulating modal parameter estimation algorithms into the unified matrix (coefficient) polynomial approach (UMPA). During this period, Dr. Allemang has authored or co-authored over 140 technical articles, including chapters for 2 different handbooks and numerous refereed articles. Dr. Allemang has participated in over 50 invited seminars or lectures in the United States as well as in Taiwan, Japan, Korea (NSF), India (NSF), Belgium, Germany and France, including being asked to give the keynote address at both the Leuven International Seminar on Modal Analysis (1990) and the 11th International Modal Analysis Conference (1993). Dr. Allemang continues to serve on the IMAC Advisory Board (Chairman, 1986-1995), is serving on the Editorial Board of *Sound and Vibration* magazine, and has served as the Associate Technical Editor for *Mechanical Systems and Signal Processing (MSSP)* and Editor for the *International Journal of Analytical and Experimental Modal Analysis (IJAEMA)*. He currently serves on the International Advisory Board for *Experimental Mechanics*.

Dr. Allemang also served as President for the Society of Experimental Mechanics

(SEM), 2003-2004, and on the Executive Board of SEM from 1998-2006. He is very active in teaching in the areas of experimental methods, vibrations and automotive design and serves as Faculty Advisor to a number of student groups at UC including the Formula SAE Team (Bearcat MotorSports), Engineering Tribunal, Tau Beta Pi and Pi Tau Sigma.

Exhibit Planning Committee

Evro T. Wee Sit



Mr. Wee Sit is the founder and managing editor of SVcommunity.com, a website dedicated to the sound and vibration community. He is

also the founder and president of Sage Technologies which markets sound and vibration instruments. Mr. Wee Sit began his career in 1985 as a test engineer for General Motors specializing in powertrain noise and vibration. He then joined Brüel & Kjær as a field applications engineer and later started an independent engineering consultancy. He is a frequent seminar instructor on the subjects of acoustics, vibration, modal analysis, instrumentation, and signal processing. Mr. Wee Sit holds a B.S.M.E./E.E. from General Motors Institute (now Kettering University). He contributes a perspective from industry based on his engineering and marketing experience.

Jenn Mowry



Ms. Mowry has worked for Brüel and Kjær for the past 9 years handling all the North American shows, hospitality events and sales meetings. Prior to that she worked for 5

years at *Sound and Vibration* magazine.

Ralph Brillhart



Mr. Brillhart is currently Vice President & Technical Director of Test Projects, with ATA Engineering, Inc. in San Diego, California. He is one of the

principals of ATA which started as a spin-off operation from Structural Dynamics Research Corporation (SDRC) in April, 2000. Including his 23 years at SDRC, he has spent almost 35 years conducting and managing test programs in the aerospace, transportation, and entertainment industries. Many of these programs have focused on dynamic and static durability and qualification testing of structures and include modal testing of aircraft, launch vehicles, satellites, and other aerospace hardware. He has become recognized worldwide in his modal testing and analysis expertise and has written numerous papers discussing the applications of modal testing techniques and new approaches to modal testing. He has conducted many large scale modal surveys of aerospace, automotive, and industrial structures over the past thirty years. Most recently he has served as a member-at-large on the SEM Executive Board.

Mr. Brillhart obtained his Bachelor of Science in Mechanical Engineering at the University of Cincinnati in 1977. In 1983, he obtained his Master of Science in Mechanical Engineering, Dynamics and Controls from the University of California, Davis.



Experimentally Speaking ...

President's Message continued from page 1

\$30,000 per year until the endowment reaches \$150,000. The funds will be used to support the Annual SEM Student Paper Competition and region student symposia. I would like to personally thank Hubert Shreier, President and CEO of Correlated Solutions, for this generous gift.

As we look forward to our annual conference in June, I can report that this year we will have a record number of papers presented. This is due in part to the fact that this is an International Congress year. I also believe that our technical divisions are more active as evidenced by unprecedented

membership participation. The conference will include four tracks, three symposia and four pre-conference courses. Our society is on a roll and I look forward to the rest of the year.



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