“Smart Structures & Sensor Technologies and Informatics”

— by American Lecture Delegation of Smart Structure Technology

在哈尔滨访问时间：

Dec. 15 ～ 17，in Harbin，at Harbin Institute of Technology (HIT)

访问团成员：

1. Shih-Chi Liu

Ph.D. & Program Director
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National Science Foundation (NSF) of U.S.

2. B.F. Spencer, Jr.

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Dean, School of Engineering & Computer Science
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Department of Mechanical and Aerospace Engineering
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报告地点：
哈尔滨工业大学二校区 土木工程学院报告厅

报告日程表：

Dec. 16

08:30-09:00 – Introduction to Smart Structures (Dr. Liu & Dr. Shoureshi)
09:00-10:30 – Sensor Technologies (Dr. Chang)
10:30-10:45 – Break
10:45-12:00 – Informatics (Dr. Shoureshi)

12:00-14:00 –
14:00-15:30 – Introduction to Structural Health Monitoring (Dr. Yuan)
15:30-15:45 – Break
15:45-17:00 – Advanced Structural Control (Dr. Spencer)

Dec. 17

08:30-09:30 – Actuator Technology for Vibration Control of Civil Engineering Structures (Dr. Spencer)
09:30-10:30 – Sensor Networks (Dr. Shoureshi)
10:30-10:45 – Break
10:45-11:30 – Sensor Technologies (Dr. Chang)
11:30-12:15 – Health Monitoring: Damage Detection Techniques (Dr. Yuan)
12:15-12:30 – Conclusions (Dr. Liu & Dr. Shoureshi)

以下为访问团伊利诺斯大学、丹佛大学、北卡罗莱纳大学成员的简介，进一步的信息可以上网：

http://nsf.gov
http://cee.uiuc.edu/sstl/
http://www.mines.edu/fs_home/rshoures/
http://www.mae.ncsu.edu/homepages/yuan/

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Educations

- B.S. Mechanical Engineering, University of Missouri-Rolla, 1981
- M.S. Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 1983
- Ph.D. Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 1985

Brief Introduction

- B.F. Spencer, Jr. holds a B.S. in Mechanical Engineering (University of Missouri ?Rolla 1981), and M.S. and Ph.D. in Theoretical and Applied Mechanics (University of Illinois at Urbana-Champaign 1983, 1985). He joined the faculty of the department of Civil and Environmental Engineering at the University of Illinois in 2002. Dr. Spencer served as a professor at the University of Notre Dame from 1985-2002.
- Dr. Spencer has taught graduate and undergraduate courses in structural mechanics, structural dynamics, and structural reliability. He is the author of two books. The first is a monograph entitled On the Reliability of Nonlinear Hysteretic Structures Subjected to Broadband Random Excitation (Springer-Verlag 1986). The second book, coauthored with Prof. K. Sobczyk, is entitled Random Fatigue: From Data to Theory (Academic Press 1992).
- Dr. Spencer has research interests primarily in the areas of stochastic fatigue, stochastic computational mechanics, earthquake engineering, damage detection and health monitoring, and civil engineering applications of smart structures technology. He is currently a member of the executive board of the Asia-Pacific Network of Centers for Research on Smart Structures Technologies (ANCRSST).

- Dr. Spencer is a member of the American Society of Civil Engineers, the Earthquake Engineering Research Institute, the International Association for Structural Control, and the International Association for Structural Safety and Reliability. He was the founding chair of the Committee on Structural Control and is the past chair of the Committee on Fatigue and fracture Reliability, both in the ASCE Structures Division. He serves as associate editor of Shock and Vibration, is on the editorial board of the Journal of Structural Control, and has served as associate editor for ASCE Journal of Structural Engineering.

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Education

- Ph.D. ME Massachusetts Institute of Technology 1981
- M.S. ME Massachusetts Institute of Technology 1978
- B.S. ME Sharif University of Technology 1975

Research Interest

- Intelligent Control, Information Engineering, Automation and Artificial Intelligence; Digital Signal Processing and Real-time Embedded Control Systems; Power and Energy Systems; Biomedical Devices and Musculoskeletal Systems; Active Noise and Vibration Control with Automotive and Aerospace Applications; Mechatronics and MEMs; Mathematical Modeling and Simulation of Complex Thermofluid and Electromechanical Systems; Monitoring and Failure Diagnostics.

Books and Book Chapters

- "Modeling and Control of Physical Systems: Theory and Design," graduate level textbook in preparation.
- R. Shoureshi, “Electro-Magnetic Acoustic Transducers (EMAT)” EPRI’s Advanced Sensor Technology book, to be published in 2000.

- “Engineering Systems,” co-editor with M. Franke, ASME publication, G 01042, Nov. 1996.
- Chapter: R. Shoureshi, “Intelligent Control Systems,” chapter 10 of the book entitled “Advanced Control Systems” IEEE/EAB publication, December 1995.
- Chapter: R. Shoureshi, M. Wheeler, L. Brackney. “Applied Intelligent Control Systems,” chapter 5 of the book entitled, “Applied Intelligence in Industrial Decision Making, Control and Automation,” Klower Academic Publishers, 1995.
- R. Shoureshi, “Self-Study on Modern Control Systems,” IEEE publication, pp. 91-94, 1995.
- Co-editor and co-author of a book entitled “Active Control of Vibration and Noise,” ASME Publication G00897, DE- Vol. 75, 1994.
- "Active Vibration and Noise Control," proceedings of the ASME Symposium, November 1994
- Chapter: R. Shoureshi, "Variable Structure and Learning Controls for Robotic Manipulators," in the book entitled "Variable Structure Control for Robotics and Aerospace Applications, No. 10, Elsevier, pp. 211-246, November 1993.
- "Intelligent Control Systems," Editor and co-author, ASME publications No. G00764, November 1992.
- Chapter: R. Shoureshi, "A Framework for Intelligent Structures," in the book entitled "Structural Control and Intelligent Systems," USC publication, July, 1992.
- Chapter: R. Shoureshi, R. Chu, M. Tenorio, "Neural Networks for System Identification," in the book entitled "Artificial Neural Networks, Concepts and Control Applications," IEEE Computer Society Press, pp. 492-496, 1992.
- "Intelligent Control Systems" Editor and co-author, ASME publications, November 1990.
- Chapter: R. Shoureshi, K. Rahmani, V. VanDoren, "Intelligent Building Control Systems," in the book entitled "Intelligent Structures," published by Elsevier, November 1990.
- "Intelligent Control Systems," Editor and co-author, ASME publication H00549, November 1988.
- "Intelligent Control," Editor and co-author, ASME publication G00382, November 1987.
- "Dynamic and Control of Thermofluid Processes and Systems," Editor and chapter author, ASME publication G00282, November 1986.
- "Modeling and Control of Robotic Manipulators and Manufacturing Processes," Editor, ASME publication G00383, November 1987.

Selected Refereed Papers

- S.A. Ottele, R. Shoureshi, D. Torgerson, J. Work, "Hopfield-Based Adaptive Observer Design for Power Transformer Diagnostics", accepted for publication in ASME Journal (J.) of Dynamic Systems, Measurement and Control, June 2001 Issue.
- L.R. Hagaman, S.F. Albert, and R. Shoureshi, “LEAP Program Monofilaments: Can They Be Used as an Accurate Diagnostic Tool?” International J. of Foot Medicine, Dec. 2000 issue.

- R. Shoureshi, B. Terry, J. Schallenkamp, D. Roberts, J. Hobbs, "Health Assessment and Diagnostics Using the World Wide Web", IEEE Transaction on Engineering Education, September 2001.
- R. Shoureshi, M. Bell, "Analysis and Design of Hybrid Vibration Control for Cable-Stayed Bridges", to be published in J. of Vibration Control, 2001.
- R. Shoureshi, R. Komistek, "Smart Implants May Soon Be A Reality", The Denver Business Journal, August 1998.
- R. Shoureshi, T. Knurek, “Automotive Applications of a Hybrid Active Noise and Vibration Control,” IEEE Control System, Vol. 16, No. 6, December 1996.
- R.A. Shoureshi, M.E. Franke, “Engineering Systems Face the Future,” ASME Mechanical Engineering, Vol. 118, No. 11, November 1996.
- R.A. Shoureshi, R.D. Hanson, H.H. Roger, C.A. Shinozuka, H.A. Smith, “Role of Intelligent Material Systems and Structures”, J. of Intl. Materials Systems And Structures, Vol. 6, No.1, pp. 3-12, January 1996.
- R. Shoureshi, M. Wheeler, L. Brackney, “Applied Intelligent Control Systems,” J. of Artificial Intelligence, pp. 101-126, Klower Academy, September 1995.
- G.T. Heydt, D. Karipides, R. Shoureshi, M. Wheeler, “Active and Reactive Power Flow for Multi-area Systems AGC,” IEEE Journal of Electric Machines and Power Systems, 1995.

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Educations

- Ph.D., University of Illinois -Urbana-Champaign, 1986
- M.S., University of Illinois -Urbana-Champaign, 1981

Fields of Interest

- Structural Health Monitoring
- Damage Tolerance of Composite Structures
- Smart Materials and Structures
- Fracture & life prediction of advanced materials and structures. .

Papers in referred journals

- The Mode-I Fracture Toughness of IM7/LaRC-RP46 Composites at High Temperatures, Accepted in Journal of Composite Materials, November, 1997.
- Stresses around the Crack Tip due to Electric Current and Self-Induced Magnetic Field, To appear in Advances in Engineering Software, 1998.
- Crack-tip Fields of Elastic-Plastic Solids under Plane Stress Mode I Loading, To appear in International Journal of Fracture, 1997.
- Determination of Elastic Constants by Inverse Analysis, Inverse Problems in Engineering, Vol. 3, pp. 1-19, 1996.

- Elastic Moduli of Carbon Matrix Composites with Interfacial Debonding, International Journal of Solids and Structures, Vol. 34, No. 2, pp. 177-201, 1997.
- Mode III Crack in a Linear Hardening Material, International Journal of Fracture, Vol. 80, No. 1, pp. 59-71, 1996.
- The Curved Interfacial Crack between Dissimilar Isotropic Solids, International Journal of Solids and Structures, Vol. 34, No. 6, pp. 641-660, 1997.
- Higher Order Asymptotic Elastic-Plastic Crack-Tip Fields under Antiplane Shear, Engineering Fracture Mechanics, Vol. 54, No. 3, pp. 405-422, 1996.
- Stress Exponents of Asymptotic Solutions at the Notch Tip in Anisotropic Power Law Material under Antiplane Shear, Engineering Fracture Mechanics, Vol. 53, No. 2, pp. 153-167, 1996.
- Cross-Plied Cylindrical Composite Shells under Transverse End Load ,Journal of Composite Materials, Vol. 29, No. 7, pp. 903-925, 1995.
- Analytical Solutions of Fully Plastic Crack-Tip Higher Order Fields under Antiplane Shear, International Journal of Fracture, Vol. 69, pp. 1-26, 1995.
- Asymptotic Crack-Tip Fields in Anisotropic Power Law Material under Antiplane Shear, Internationsl Journal of Fracture, Vol. 71, pp. 177-195, 1995.
- Interfacial Circular Crack in Cylindrically Anisotropic Composites under Antiplane Shear, International Journal of Solids and Structures, Vol. 32, No. 24, pp. 3603-3628, 1995.
- Composite Laminated Shells under Transverse End Load, Mechanics of Composite Materials and Structures, Vol. 2, pp. 139-162, 1995.
- Bending of Filament Wound Composite Laminated Cylindrical Shells, International Journal of Composite Engineering, Vol. 3, No. 9, pp. 835-849, 1993.
- Thermal Stresses in Composite Shells, Composite Structures, Vol. 26, Nos. 1 & 2, pp. 63-75, 1993.
- Transverse Cracking and Stiffness Reduction in Composite Laminates, Journal of Reinforced Plastics and Composites, Vol. 12, No. 9, pp. 987-1015, 1993.
- Analysis of Thick-Section Composite Cylindrical Shells under Hydrostatic Pressure, Composite Materials: Testing and Design (Eleventh Volume), ASTM STP 1206, E. T. Camponeschi, Jr., Ed., American Society for Testing and Materials, pp. 607-632, 1993.
- The Effects of Molecular Weight on Transverse Microcracking in High-Temperature LaRC-RP46 Polyimide Composites, Journal of Advanced Materials, Vol. 25, No. 1, pp. 30-34, 1993.