

## Curriculum Vitae

### I. Professional Background

**Name:** Mark W. Lin

**Rank and Year Appointed to that Rank:** Associate Professor, August 16, 2000

**Year of Appointment to Graduate Faculty:** September 18, 2001

**Department:** Mechanical and Aerospace Engineering

**Office Address:** Room N268, Technology Hall

**Academic Specialty:** Mechanical Engineering

#### Degrees:

(1) Bachelors degree:

Title of degree: Bachelor of Science  
Year awarded: 1982  
Institution: Tamkang University, Taipei, Taiwan  
Major: Mechanical Engineering

(2) Masters degree:

Title of degree: Master of Science  
Year awarded: 1987  
Institution: Virginia Polytechnic Institute and State University  
Major: Engineering Science and Mechanics  
Thesis title: "Elastoplastic Response of Unidirectional Graphite/Aluminum under Combined Tension-Compression Cyclic Loading"

(3) Doctoral degree:

Title of degree: Doctor of Philosophy  
Year awarded: 1993  
Institution: Virginia Polytechnic Institute and State University  
Major: Mechanical Engineering  
Dissertation title: "Theoretical Modeling of the Actuation Mechanism in Integrated Induced Strain Actuator/Substructure Systems"

#### Nonacademic professional experience:

1994 - 1994, Research Engineer, Paradigm Inc., Blacksburg, Virginia.

#### Academic experience:

1994 – 2000, Assistant Professor, Department of Engineering, Clark Atlanta University.  
1982 – 1985, Instructor, Department of Mechanical Engineering, Kwang-Wu Institute of Technology, Taipei, Taiwan.

### II. Teaching Activities:

#### Courses Taught

##### Undergraduate

Vibrations  
Kinematics of Machines  
Mechanics and Design of Machine Elements  
Engineering Dynamics  
Engineering Statics  
Numerical Methods and Computation

##### Graduate

Graduate Engineering Analysis I  
Graduate Engineering Analysis II  
Vibrations of Elastic Systems  
Elasticity  
Applied Solid Mechanics  
Finite Element Analysis I

#### Thesis Advised

Cory Kendall, *M.S.*, Thesis Title: "Finite Element Analysis Technique for Unidirectional Fiber-Reinforced Composites with Localized Wrinkles"

Roosevelt Wright, *M.S.*, Thesis Title: “Design and Analysis of a Titanium/Nanocomposite Pressure Vessel for Aerospace Applications”

Rakesh Reddy Chandupatla, *M.S.*, These Title: “Finite Element Study of a Pultruded Fiber Reinforced Polymer Residential House Frame Structure under Hurricane Wind Loads”

Abhishek Jadhav, *M.S.*, Thesis Title: “Modal-Based Chemical and Biological Microcantilever Sensors with Enhanced Selective Normal Mode,”

Sunil Nannepaga, *M.S.*, Thesis Title: “Calibration Algorithm for Secondary Reflections in Distributed Electrical Time Domain Reflectometry (ETDR) Sensing,”

Touseef Syed, *M.S.*, Thesis Title: “Theoretical Modeling for Modal-Based Chemical and Biological Microcantilever Sensors,”

Mehran Khoshbakht, *Ph.D.*, Dissertation Title: “Modeling of Hygro-Thermo-Mechanical Response of a Masonry Structure with Fiber Reinforced Polymer Composites Reinforcement”

Jagan Mohan Reddy Thaduri, *M.S.*, Thesis Title: “Structural Response Monitoring and Damage Detection Using an Embedded ETDR Sensor.”

Trilok Chander Manchillina, *M.S.* Thesis Title: “Impedance Based Structural Health Monitoring Using Active Piezoelectric Sensors.”

### III. Research, Creative, and Scholarly Activity:

#### ▪ Refereed Journal Articles:

Khoshbakht, M. and Lin, M. W., 2010, “A Finite Element Model for Hygro-Thermo-Mechanical Analysis of Masonry Walls with FRP Reinforcement,” *Finite Elements in Analysis and Design*, Vol. 46, pp. 783-791..

Khoshbakht, M., Lin, M. W., Carl A. Feickert, 2009, “A Finite Element Model for Hygrothermal Analysis of Masonry Walls with FRP Reinforcement,” *Finite Elements in Analysis and Design*, 45 (2009) 511-518.

Khoshbakht, M. and Lin, M. W., 2006, “Development of an Electrical Time Domain Reflectometry (ETDR) Distributed Moisture Sensor for Porous Media,” *Measurement Science and Technology*, Vol. 17, pp. 2989-2996.

Lin, M. W., Berman, J., Khoshbakht, M., Feickert, C. A., and Abatan, A O., 2006, “Modeling of Moisture Migration in an FRP Reinforced Masonry Structure,” *Building and Environment*, 41 (2006), 646 – 656.

Khoshbakht, M., Lin, M. W., and Berman, J. B., 2006, “Analysis of Moisture Induced Stresses in an FRP Composites Reinforced Masonry Structure,” *Finite Elements in Analysis and Design*, 42 (2006), 414-429.

Lin, M. W. and Thaduri J., 2006, “Structural Deflection Monitoring Using an Embedded ETDR Distributed Strain Sensor,” *Journal of Intelligent Material Systems and Structures*, Vol. 17, No. 5, pp. 423-430.

Lin, M. W. and Thaduri, J., 2005, “Structural Damage Detection Using an Embedded ETDR Distributed Strain Sensor,” *Subsurface Sensing Technologies and Applications*, Vol. 6, No. 4, pp. 315-336.

Lin, M. W., Thaduri, J., and Abatan, A. O., 2005, "Development of an Electrical Time Domain Reflectometry (ETDR) Distributed Strain Sensor," *Measurement Science and Technology*, Vol. 16, pp. 1495-1505.

Lin, M. W., Abatan, A. O., and Rogers, C. A., 1994, "Application of Commercial Finite Element Codes for the Analysis of Induced Strain Actuated Structures," *Journal of Intelligent Material Systems and Structures*, Vol. 5, No. 6, pp. 869-875.

Pindera, M. J. and Lin, M. W., 1989, "Micromechanical Analysis of the Elastoplastic Response of Metal Matrix Composites," *Journal of Pressure Vessel Technology*, Vol. 111, No. 2, pp. 183-190.

▪ **Abstracts and Papers Delivered at Professional Meetings:**

Lin M. W., Syed, T., George, M. A., "Modal-Based Chemical/Biological Microcantilever Sensors," 21st Canadian Congress of Applied Mechanics, Toronto, Canada, June 3 - 7, 2007.

Lin M. W., Marotta, S., and Ooi, T., 2005, "Diagnosis of Free-Drop Shock Events Using On-Board Sensor Signals," Proceedings of 2005 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Portland, Oregon, June 7 - 9, 2005.

Khoshbakht, M. and Lin, M. W., 2005, "Hygrothermal Modeling of FRP Reinforced Masonry Walls," Proceedings of ASME Annual Southeastern Region XI Technical Conference, Jacksonville, Florida, April 8-9, 2005.

Lin, M. W. and Thaduri J., 2004, "Structural Response Monitoring and Damage Detection Using an Embedded ETDR Distributed Sensor", Proceedings of the 11th Annual International Conference on Composites/Nano Engineering, Hilton Head Island, South Carolina, August 8-14, 2004.

Lin, M. W., Berman, J., Khoshbakht, M., and Feickert, C. A., 2002, "Nonlinear Finite Element Modeling of Moisture Migration in a Masonry Structure with FRP Upgrade," Proceedings of the 2nd Canadian Conference on Nonlinear Solid Mechanics, Vancouver, BC, Canada, June 19-23, 2002.

Lin, M. W. and Zhou, Y. M., 2000, "Environmental Loading Effects on Impedance-Based Piezosensor for Damage Detection of FRP Reinforced Concrete," Proceedings of the Seventh Annual International Conference on Composites Engineering (ICCE/7), Denver, Colorado, July 2-8, 2000, pp. 541-542.

Lin, M. W., Abatan, A. O., and Zhou, Y. M., 2000, "High Sensitivity Electrical TDR Distributed Strain Sensor," SPIE Proceedings, Vol. 3986, pp. 463-471.

Lin, M. W., Abatan, A. O., and Zhou, Y. M., 2000, "Transverse Shear Response Monitoring of Concrete Cylinder Using Embedded High-Sensitivity ETDR Sensor," SPIE Proceedings, Vol. 3988, pp. 319-328.

Lin, M. W., Abatan, A. O., and Zhang, W. M., 1999, "Crack Damage Detection of Concrete Structures Using Distributed Electrical Time Domain Reflectometry (ETDR) Sensors," SPIE Proceedings, Vol. 3671, pp. 297-304.

Danjaji, M. B., Abatan, A. O., and Lin, M. W., 1999, "Experimental Characterization of ETDR Sensors for Crack Monitoring in Concrete Structures," SPIE Proceedings, Vol. 3852.

Lin, M. W., Abatan, A. O., and Zhang, W. M., 1998, "Crack Damage Detection of Structures Using Distributed Electrical Time Domain Reflectometry (ETDR) Sensors," SPIE Proceedings, Vol. 3325, pp. 173-180.

Lin, M. W., Abatan, A. O., and Danjaji, M. B., 1997, "Electrical Time Domain Reflectometry Sensing Cables as Distributed Stress/Strain Sensors in Smart Materials Systems," SPIE Proceedings, Vol. 3042, pp. 33-44.

Abatan, A. O., Hu, H., Lin, M., Roberts, G. and Pereira, M., 1997 "On the Fabrication and Impact Modeling of Hybrid Metal Laminates," NASA HITEMP Review Proceedings, NASA Publication No. 10192, Vol. I, Paper 12, April 1997.

Lin, M. W. and Paine, J. S. F., 1995, "Structural Stress Alleviation of Composite Pressure Vessels Using Shape Memory Alloy Actuators," Proceedings of the Second Annual International Conference on Composites Engineering (ICCE/2), New Orleans, LA, August 21-24, 1995, pp. 457-458.

Lin, M. W. and Rogers, C. A., 1994, "A Mechanical Approach to Interfacial Stress Alleviation in an Integrated Induced Strain Actuator/Substructure System," Proceedings of the AIAA/ASME/ASCE/AHS/ASC 35th Structures, Structural Dynamics, and Materials Conference, Hilton Head, SC, April 18-22, 1994.

Lin, M. W. and Rogers, C. A., 1994, "Induced Strain Actuation on a Beam Structure Subjected to External Loads," Proceedings of the SPIE 1994 North American Conference on Smart Structures and Materials, Orlando, FL, February 13-18, 1994.

Lin, M. W. and Rogers, C. A., 1994, "Bonding Layer Effects on the Actuation Mechanism of an Induced Strain Actuator/Substructure System," Proceedings of the SPIE 1994 North American Conference on Smart Structures and Materials, Orlando, FL, February 13-18, 1994.

Lin, M. W. and Rogers, C. A., 1993, "Actuation Response of a Beam Structure with Induced Strain Actuators," Proceedings of the Adaptive Structures and Material Systems Symposium, ASME Winter Annual Meeting, New Orleans, LA, November 28-December 3, 1993.

Lin, M. W. and Rogers, C. A., 1993, "Modeling of the Actuation Mechanism in a Beam Structure with Induced Strain Actuators," Proceedings of the AIAA/ASME/ASCE/AHS/ASC 34th Structures, Structural Dynamics, and Materials Conference, La Jolla, CA, April 19-22, 1993.

Lin, M. W. and Rogers, C. A., 1992, "Formulation of a Beam Structure with Induced Strain Actuators Based on an Approximated Linear Shear Stress Field," Proceedings of the AIAA/ASME/ASCE/AHS/ASC 33rd Structures, Structural Dynamics, and Materials Conference, Dallas, TX, April 13-15, 1992.

Lin, M. W. and Rogers, C. A., 1991, "Analysis of Stress Distribution in a Shape Memory Alloy Composite Beam," Proceedings of the AIAA/ASME/ASCE/AHS/ASC 32nd Structures, Structural Dynamics, and Materials Conference, Baltimore, MD, April 13-15, 1991.

Lin, M. W. and Rogers, C. A., 1989, "Fundamental Design Issues Related to Shape Memory Alloy Composites," Proceedings of the SPIE OE/FIBERS' 89, 15th Conferences, Boston, MA, September 5-8, 1989.

▪ **Other Publications:**

Lin, M. W., 2005, "Structural Health Monitoring for Tactical Systems Support" Final Project Report, University of Alabama in Huntsville, November 2005.

Lin, M. W. and Manchillina, T. C., 2005, "Active Sensor for Self-Diagnostics and Prognostics Application in Flight Vehicle and Missile Systems" Final Project Report, University of Alabama in Huntsville, January 2005.

Lin, M. W., Thaduri, J., and Gopu, V., "A Distributed Strain Sensor for Bridge Monitoring," University Transportation Center for Alabama, UTCA Report Number 02304, August 30, 2003.

Feickert, C. A., Lin, M. W., Trovillion, J. C., Abatan, A. O., and Berman, J. B., "Hygrothermal Modeling in the Application of Fiber-Reinforced Polymers for Structural Upgrade of Unreinforced Masonry Walls," Engineering Research and Development Center, ERDC/CERL TR-03-20, September 2003.

Lin, M. W., Abatan, A. O., Danjaji, M. B., and Zhou, Y. M., 2000, "Health Monitoring of Concrete Structures Using Distributed Electrical Time Domain Reflectometry (ETDR) Sensors," Project Final Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, December 2000.

Lin, M. W., Abatan, A. O., Danjaji, M. B., and Zhou, Y. M., 1999, "Structural Integrity Monitoring Using High Sensitivity Electrical TDR Sensor," Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, December 1999.

Lin, M. W., 1999, "Characterization of Impedance-Based Piezosensor Subject to Combined Hygro-Thermal-Mechanical Load," Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, November 1999.

Lin, M. W., Abatan, A. O., Danjaji, M. B., and Zhang, W. M., 1998, "Integrity Monitoring of Concrete Structures Using Embedded Electrical Time Domain Reflectometry (ETDR) Sensors," Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, December 1998.

Talukder, N. and Lin, M. W., 1998, "Mechanism of Neck Injury to Air Force Pilots." Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, October 1998.

Lin, M. W., Abatan, A. O., and Danjaji, M. B., 1997, "Characterization of Embedded Electrical Time Domain Reflectometry (ETDR) Sensors," Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, October 1997.

Lin, M. W., Abatan, A. O., and Danjaji, M. B., 1996, "Characterization of Electrical Time Domain Reflectometry (ETDR) Stress/Strain Sensors," Project Report, Department of Engineering, Clark Atlanta University, Atlanta, Georgia, October 1996.

Lin, M. W. and Rogers, C. A., 1989, "Investigation of Fundamental Design Issues Related to Shape Memory Alloy Reinforced Composites," SMSL-FR-89-1 (VPI-E-89-3) Report, VPI&SU, Blacksburg, Virginia, February 1989.

▪ **Invited Colloquia, Seminars and Presentations:**

- "Sensors, Actuators, and Smart Structures," Boeing Huntsville Design Center, October 10, 2012
- "Modeling of Hygro-Thermo-Mechanical Response of a Masonry Structure with Fiber Reinforced Polymer Composites Reinforcement," Department of Polymer Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan, December 15, 2009
- "Modeling of Hygro-Thermo-Mechanical Response of a Masonry Structure with Fiber Reinforced Polymer Composites Reinforcement," Department of Civil Engineering, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan, December 25, 2008.
- "Modeling of Hygro-Thermo-Mechanical Response of a Masonry Structure with Fiber Reinforced Polymer Composites Reinforcement," Department of Mechanical Engineering, Yung Ta Institute of Technology and Commerce, Pingtung, Taiwan, December 26, 2008.
- "Electrical Time Domain Reflectometry (ETDR) Distributed Strain Sensors," Department of Mechanical Engineering, National Pingtung University of Science and Technology, Pingtung, Taiwan, December 30, 2008.
- "Electrical Time Domain Reflectometry (ETDR) Distributed Strain Sensors," Department of Mechanical Engineering, Kao Yung University, Kaohsiung, Taiwan, December 31, 2008
- "Modeling of Moisture Migration in an FRP/Reinforced Masonry Structure," Mathematical Sciences Colloquium at the Mathematical Sciences Department at UAH, November 8, 2002.

▪ **Research Grants and Contracts Received:**

Funded Research Projects

"Aircraft Component Remediation," U.S. Army Aviation and Missile Command, Blackhawk Office, 02/22/2010 – 12/31/2010, 50% responsibility.

“CH-47 Rotor Blade Reliability NDE & Coupon Testing,” U.S. Army Aviation and Missile Command, 12/19/2008 – 12/31/2009, 10% responsibility.

“Structural Health Monitoring for Tactical Systems Support,” U.S. Army Aviation and Missile Command through Westar, 13 October 2003, 2 year, 100% responsibility.

“Active Sensor for Self-Diagnostics and Prognostics Application in Flight Vehicle and Missile Systems,” U.S. Army Space and Missile Defense Command through EETEAMS Grants for Colleges and Universities Consolidated Grant, 02 April 2003, 1.5 year, 100% responsibility.

“Characterization and Modeling of Long-Term Durability of FRP Composites Reinforced Masonry Structures,” US Army Corps of Engineers - Engineer Research and Development Center (ERDC), 18 April 2001, 2 years, 100% responsibility.

“Increased Aviation Safety Through Improved Composite Materials,” Congressional Set-Aside Appropriation Grant, Administered by NASA-Langley Research Center, 01 April 2002, 1 year, 20% responsibility.

“Development of Distributed Strain Sensor for Bridge Health Monitoring,” The University Transportation Center for Alabama (UTCA), 01 January 2002, 1 year, 100% responsibility.

“Light Sail Technology Research and Development Support,” Teledyne Brown Engineering, Inc., 01 October 2000, 1.5 years, 30% responsibility.

“Solid State Hybrid Linear/Rotary Stepper Motor,” Defense Advanced Research Projects Agency (DARPA), Small Business Technology Transfer (STTR) Program, Phase I, Subcontract from Genex Technologies, Inc., 01 August 1999, 1 year, 100% responsibility.

“Health Monitoring of Structures Using Distributed Electrical Time Domain Reflectometry (ETDR) Sensor,” US Army Construction Engineering Research Laboratory (USACERL), 01 December 1995, 5 years, 50% responsibility.

“Mechanisms of Neck Injury to Air Force Pilots,” US Air Force Armstrong Laboratory (AFMC), Human Systems Center, 01 July 1996, 1 year, 50% responsibility.

“Characterization and Engineering Application of Induced Strain Smart Materials,” National Aeronautics and Space Administration (NASA), CAU High Performance Polymer and Composites Center (HiPPAC), 01 January 1997, 5 years, 10% responsibility.

“Integrity Monitoring of Timber Structures Using Integrated High-Sensitivity ETDR Coaxial Sensor,” US Department of Agriculture Forest Product Laboratory (USDAFPL), 01 January 2000, 5 months, 100% responsibility.

“Characterization of Impedance-Based Piezoelectric Sensor,” USACERL, 01 October 1998, 1 year, 100% responsibility.

“Development of Distributed ETDR Stress/Strain Sensor for Glued Laminated (Glulam) Timber Structure Application,” USDAFPL, 01 June 1997, 6 months, 100% responsibility.

#### **IV. Service Activities:**

##### Professional Service

Paper Reviewer, Journal of Intelligent Material Systems and Structures  
European Journal of Mechanics – A/Solids  
Acta Mechanica  
Modeling and Simulation in Materials Science and Engineering  
Shock and Vibration Journal  
Composites Engineering Journal  
Mechanics of Advanced Materials and Structures

AIAA Journal of Spacecraft and Rockets  
Measurement Science and Technology  
International Journal of Solids and Structures  
Journal of Applied Physics  
Composites Science and Technology  
Proposal Reviewer, Kentucky Science and Technology Corporation

Conference Session Chair, Session 6c, Infrastructure IV, the Seventh Annual International  
Conference on Composites Engineering (ICCE/7), Denver, Colorado, July 2-8, 2000.

Service to the University

Faculty Senate (Fall 2004 – Spring 2010, Fall 2014 – present))

Service to the Department

ABET Coordinator (Spring 2010 – Spring 2012)

Graduate Committee (UAH, 2004-present)

Ph.D. Preliminary Examination Faculty Coordinator (UAH, 2001 – pres.)

Undergraduate Committee (UAH, 2000-2001, 2002 – 2010, Chair, 2010)

Course Coordinator (UAH, MAE 198 Engineering Graphics and MAE 394 CAD/CAM)

Course Assessment Committee (UAH, Mathematics and Computer Group)

Research Facility Development Committee (CAU)

Scholarship Committee (CAU, 1998 - 2000)

Community Service

- Event Supervisor and Judge, UAH Science Olympiad Competition, Spring 2002.
- Judge, Science, Engineering, and Mathematics Day, Spelman College, Atlanta, Georgia, 1999, 1998, 1997

**V. Honors, Awards, and Special Recognitions:**

Most Dedicated Professor in Mechanical Engineering

Clark Atlanta University, Department of Engineering, 1999

Research Product Development Team Award

United States Army Construction Engineering Research Laboratory (USACERL), 1997