

# Curriculum Vitae

## M. Reza Vaghar, Ph.D., P.E., ACTAR



Dr. Vaghar's work experience includes positions in consulting firms, research laboratories, and academia. As an adjunct professor, he has taught courses in mechanics and design. As a research scientist, he has been involved in the design and manufacturing of mechanical structures. As a mechanical engineering consultant for about 17 years, he specializes in vehicular accident reconstruction, walkway safety, product failure, and safety analysis. He applies the principles of physics, engineering, and safety to the evaluation of walkways, consumer products and manufacturing processes. Dr. Vaghar has reconstructed many accidents involving automobiles, motorcycles, pedestrians, and commercial vehicles.

### Licensure and Certification

- Licensed Professional Engineer in Florida #54664 and California #32097
- ACTAR Accredited Traffic Accident Reconstructionist, #1173
- Certified XL Tribometrist, English XL Variable Incidence Tribometer (CXLT)
- Certified Forensic Mapping Specialist
- Certified Vetronix Crash Data Retrieval System Operator
- Certified Fire and Explosion Investigator, #8818-3784
- Authorized General Industry Outreach Trainer, Occupational Safety and Health Administration

### Formal Education

- Doctor of Philosophy in Engineering Mechanics and Sciences, University of Florida, 1996
- Master of Science in Mechanical Engineering, Florida State University, 1992

### Professional Development

- Symposium on Traffic Safety, Institute of Police Technology and Management, Orlando, FL, 2017
- World Reconstruction Exposition, Orlando, FL, 2016
- Update for General Industry Outreach Trainers, OSHA Training Institute Education Center, 2016
- Applying Automotive EDR Data to Traffic Crash Reconstruction, SAE International, 2014
- Crash Data Retrieval User's Summit, Houston TX, 2014
- Walkway Auditor Training Course, ASTM F2948, Houston TX, 2014
- Accessing and Interpreting Heavy Vehicle Event Data Recorders Seminar, SAE, Oxnard, CA, 2012
- EdgeFX Diagramming and Animation, Visual Statement, Orlando, FL, 2012
- Understanding Slip and Fall Events: A Biomechanical Perspective, University of Southern California, Los Angeles, CA, 2012
- United States Department of Labor, Occupational Safety and Health Administration, OSHA 503, 2012
- ARC-CSI Crash Conference, Las Vegas, NV, 2010
- Human Factors for Accident Reconstruction, Lake Mary, FL, 2010
- Special Problems in Traffic Crash Reconstruction, Institute of Police Technology and Management, Orlando, FL, 2009
- Update for General Industry Trainers, U.S. Department of Labor, Occupational Safety and Health Administration, 2008
- English XI Variable Incidence Tribometer Certification Program, 2008
- Forensic Mapping, MJC & Associates, Orlando, FL, 2007
- Basic/Advanced Diagramming and Animation, Visual Statement, Orlando, FL, 2007
- National Fire, Arson, & Explosion Investigation Training Program, NAFI, 2007
- Pro/Engineer Wildfire 2.0, Enser Corporation, Orlando, FL, 2005

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- United States Department of Labor, Occupational Safety and Health Administration, Course #503, 2005
- Occupant Kinematics and Injury Mechanisms During Motor Vehicle Collisions, University of California at Riverside, 2004
- Analysis of Collisions Involving Pedestrians or Bicyclists, Collision Safety Institute, Inc., 2004
- Crash Data Retrieval (CDR) System Operator, Collision Safety Institute, Inc., 2003
- Advanced PC-Crash vehicle accident reconstruction simulation, McInnis Engineering, 2003
- PC-Crash vehicle accident reconstruction simulation, McInnis Engineering, 2003
- Fire and explosion investigation, Benedict Engineering Company, 2002
- Traffic Accident Reconstruction, Northwestern University, 2002
- US Department of Labor, Occupational Safety and Health Administration, Course #501, 2002
- Accident Reconstruction for Traffic Engineers, Northwestern University, 2000

## Professional Affiliations

- American Society of Mechanical Engineers (ASME), Member
- American Society of Safety Engineers (ASSE), Member
- Society of Automotive Engineers (SAE) International, Member
- Human Factors and Ergonomics Society, Member
- National Association of Professional Accident Reconstruction Specialists, Member
- American Society for Testing and Materials (ASTM) International, Member
- National Association of Fire Investigators (NAFI), Member
- Florida Engineering Society (FES), Professional Engineer
- Accident Reconstruction Network (ARC Network), Member
- National Society of Professional Engineers (NSPE), Member

## Professional Experience

- Project Manager, Forensic Engineering Technologies, LLC, Orlando, FL, 2009 – Present
- Failure Analyst/Mechanical Engineer/Project Manager, Kimley-Horn and Associates, Inc., Orlando, FL, 2006 – 2009
- Consulting Engineer/Team Leader, Benedict Engineering Company, Inc., Tallahassee, FL, 2000 – 2006
- Visiting Scientist, Laboratory for Micromechanics of Materials, Florida State University, FAMU-FSU College of Engineering, Tallahassee, FL, 1998 – 2000
- Post Doctoral Research Associate, Magnet Science and Technology, Florida State University, National High Magnetic Field Laboratory, Tallahassee, FL, 1996 – 1998
- Doctoral Research Assistant, University of Florida, College of Engineering, Gainesville, FL, 1994 – 1996

## Teaching Experience – Florida State University, FAMU-FSU College of Engineering, Tallahassee, FL

- Mechanical Engineering Department, Part-time Adjunct Faculty – Courses taught: Computer Aided Design, 2005 –2006
- Mechanical Engineering Department, Part-time Adjunct Faculty – Courses taught: Statics and Mechanics of Materials, 2000

## Honors and Awards

- Referee for Institute of Physics and Journal of Physics D, Applied Physics
- Technical Evaluator for Society of Automotive Engineers International
- Competent Leader, Toastmasters International, 2003
- Competent Toastmaster, Toastmasters International, 2002
- Award for Academic Achievement, University of Florida, Gainesville, FL, 1995 and 1996
- Who's Who in Science and Engineering, Who's Who in America, Who's Who in the World

## Patent

- Pivotal Guards for Power Hand Tools with Rotating Discs, # 6,699,114. Issued 3/2/04.

## Publications

- "Data Collection and Simulation Methods Used in Motor Vehicle Accident Reconstruction," Vaghar, M. Reza and D.J. Fournier, Jr. Florida Engineering Society Journal, Volume 60, Number 6, February 2007.
- "A Unified Model for Inelastic Deformation of Polycrystalline Materials - Application to Transient Behavior in Cyclic Loading and Relaxation," H. Garmestani, M. R. Vaghar, and E. W. Hart. Int. Journal of Plasticity, Vol. 17, No. 10, pp. 1367-1391, Oct. 2001.
- "Viscoplastic Analysis of Structural Polymer Composites Using Stress Relaxation and Creep Data," M. Haik, M. R. Vaghar, H. Garmestani, and M. Shahawy. Journal of Composites Part B: Engineering, Vol. 32, No. 2, pp. 165-170, March 2001.
- "Stress Analysis of Superconducting Magnets Using Green's Functions Solution," M. R. Vaghar, and H. Garmestani. ASME Journal of Applied Mechanics, Vol. 68, No. 1, pp. 11-18, January 2001.
- "Roads to 100 T Pulse Magnets," M. R. Vaghar, Y. Eyssa, L. Li, R. Kratz, and H. J. Schneider-Muntau. IEEE Transactions on Superconductivity, Vol. 10, No. 1, pp. 507-509, January 2000.
- "Generalized Plane Strain Analysis of Superconducting Solenoids," W. D. Markiewicz, M. R. Vaghar, I. R. Dixon, and H. Garmestani. J. of Applied Physics, Vol. 86, No. 12, pp. 7039-7051, December 1999.
- "Feasibility of Micro-Coils," M. R. Vaghar, S. Wirth, V. Neu, P. Xiong, von Molnar, L. Li, and H. J. Schneider-Muntau. Proceeding of VIII International Conference on Megagauss Magnetic Field Generation and Related Topics, October 1998.
- "A Possible 100 T Design," R. Kratz, Y. Eyssa, L. Li, H. J. Schneider-Muntau, M. R. Vaghar, and S. W. Van Sciver. Proceeding of VIII International Conference on Megagauss Magnetic Field Generation and Related Topics, October 1998.
- "Optimal Use of Magnetic Energy in a Magnet," R. Kratz, Y. Eyssa, L. Li, H. J. Schneider-Muntau, M. R. Vaghar, and S. W. Van Sciver. Proceeding of VIII International Conference on Megagauss Magnetic Field Generation and Related Topics, October 1998.
- "A Poly-Layer Reinforcement Scheme for Pulse Magnets," B. J. Gao, H. J. Schneider-Muntau, Y. Eyssa, M. R. Vaghar, and P. Pernambuco-Wise. Proceeding of 15th Int. Conf. Mag. Tech., Part I, pp. 648-651, Beijing, 1998.
- "Elastoplastic Stress Analysis of Nb<sub>3</sub>Sn Superconducting Magnet," M. R. Vaghar, H. Garmestani, and W. D. Markiewicz. Journal of Applied Physics, Vol. 80, No. 4, pp. 2490-2500, August 1996.
- "A Numerical Three Dimensional Axisymmetric Stress Analysis for Multilayer Elastoplastic High Field Solenoid Magnets," M. R. Vaghar. Research Report, National High Magnetic Field Laboratory Tallahassee, FL, July 1996.
- "Stress Analysis of Superconducting Solenoid Using Green's Functions Solution," M. R. Vaghar, H. Garmestani, W. Markiewicz, and H. J. Schneider-Muntau. Annual Research Report, National High Magnetic Field Laboratory, Tallahassee, FL, pp. 118-119, December 1995.
- "Stress Analysis of an Orthotropic Work Hardening Cylinder with Body Force," H. Garmestani, M. R. Vaghar, W. Markiewicz, and N. Chandra. International Journal of Mechanics of Structures and Machines, Vol. 23, No. 4, pp. 521-548, November 1995.

- "Concept of Plasticity in Solenoid Stress Analysis," H. Garmestani, M. R. Vaghar, and W. Markiewicz. IEEE Transactions on Magnetics, Vol. 30, No. 4, pp. 2237-2240, July 1994.
- "Generalized Plane Strain Analysis of Solenoid Magnets," W. D. Markiewicz, M. R. Vaghar, I. R. Dixon, and H. Garmestani. IEEE Transactions on Magnetics, Vol. 30, No. 4, pp. 2233-2236, July 1994.
- "Stress Analysis of an Orthotropic Cylinder with Magnetic Body Forces," H. Garmestani, M. R. Vaghar, and W. Markiewicz. Research Report, National High Magnetic Field Laboratory, Tallahassee, FL, December 1993.
- "Generalized Plane Strain Analysis of Solenoid Magnets: Formulation and Examples," W. D. Markiewicz, M. R. Vaghar, I. R. Dixon, H. Garmestani, and J. Jimeian. Research Report, National High Magnetic Field Laboratory, Tallahassee, FL, September 1993.

## **Presentations**

- "Enhancing Accident Reconstruction," presented at the Dade County Defense Bar Association, Miami, FL, June 2005
- "Enhancing Accident Reconstruction with the Latest Technology," presented at the Absolute Litigators Conference IX, Professional Education Systems Institute, Las Vegas, NV, April 2004
- "Feasibility of Micro-Coils," presented at the VIII International Conference on Megagauss Magnetic Field Generation and Related Topics, Tallahassee, FL, October 1998.
- "Three-Dimensional Axisymmetric Stress Analysis of High Field Solenoid Magnets," presented at the Magnet Science and Technology Seminars, National High Magnetic Field Laboratory, Tallahassee, FL, December 1996.
- "Stress Analysis of Superconducting Magnets," presented at the Mechanical Engineering Seminars, FAMU-FSU College of Engineering, Tallahassee, FL, August 1996.
- "Closed Form Solutions for Elastoplastic Behavior of Superconducting Magnets and Coils," presented at the Magnet Science and Technology Seminars, National High Magnetic Field Laboratory, Tallahassee, FL, March 1996.
- "Stress Analysis of Superconducting Solenoid Using Green's Functions Solution," presented at the Society of Engineering Science 32nd Technical Meeting, New Orleans, LA, November 1995.
- "Elastic-Plastic Stress Analysis of a Composite Cylinder with Body Forces," presented at the International Conference on Composites Engineering, New Orleans, LA, August 1995.