

CURRICULUM VITAE

Thurmon E. Lockhart, Ph.D. Professor

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DESCRIPTIVE VITAE

Thurmon E. Lockhart earned his BS (92), MS (97), and Ph.D. (2000), in Industrial Engineering with a Biomechanics concentration from Texas Tech University. Dr. Lockhart is currently a Professor of Biomedical Engineering and Biological Design in the School of Biological Health and Systems Engineering at Arizona State University. He is also an Adjunct Professor at Barrow Neurological Institute and, a guest Professor at Ghent University in Belgium. Previously (2000-2014), Dr. Lockhart was a Professor at Virginia Tech, Industrial and Systems Engineering Department and, Virginia Tech/Wake Forest School of Biomedical Engineering and Science.

Professor Lockhart's research and [publications](#) concern the identification of injury mechanisms and quantification of sensorimotor deficits and movement disorders associated with aging and neurological disorders on fall accidents. His academic grounding in biomechanical modeling, nonlinear dynamics, human postural control, gait mechanics, and wearable biosensor design underscore a fundamental capacity to provide unique clinical solutions to injury preventions utilizing both engineering and biomedical principles. As a result of above initiatives, Dr. Lockhart has published over 100 manuscripts in refereed publications. Professor Lockhart is currently an Associate Editor of the [Annals of Biomedical Engineering \(Springer\)](#) and Editorial Board of the [Ergonomics \(Taylor & Francis\)](#), [Sensors](#), and Board of Consulting Editors of the [Journal of Biomechanics](#) (Elsevier).

Professor Lockhart has worked on a number of research projects in the area of human locomotion, gait and posture, and wearable sensors related to fall risk evaluations. His efforts have involved contractual research and development from the National Science Foundation (NSF), CDC, NIH, National Institute of Occupational Safety and Health (NIOSH), Office of Naval Research (ONR), Department of Labor (DOL), Whitaker Foundation, Los Alamos National Laboratory, UPS, ITT and others. Additionally, collaboration with ITT in development of the new "Night-Vision" system in 2014 has led to the patent-8648897: A System and Method for Dynamically Enhancing Depth Perception in Head Borne Video Systems.

Dr. Lockhart has translated research findings into practice by reaching a significant number of external organizations and individuals. His outreach efforts have impacted several organizations including the UPS, Diageo, Los Alamos National Security, DOE, GE, BP, SnapOn Tools and the US Navy. In recognition of these scientific achievements, Dr. Lockhart and co-workers were awarded the Alexander C. Williams, Jr., Design Award from the Human Factors and Ergonomics Society in 2008. His research was recently featured on the PBS NOVA ScienceNow and Good Morning America programs, Fortune, AgingWell, Men's Health and Discover magazines.

EDUCATION

Ph.D. Industrial and Systems Engineering, Texas Tech, Lubbock, TX, May 2000 “Biomechanics of Slips and Falls”
M.S. Industrial Engineering, Texas Tech, May 1997
B.S. Industrial Engineering, Texas Tech May 1992

EMPLOYMENT

08/2014 – present **Professor**, School of Biological and Health Systems Engineering, Ira A. Fulton Schools of Engineering, Arizona State University, Tempe, AZ
06/2013 – 07/2014 **Professor**, Grado Department of Industrial and Systems Engineering, Virginia Tech, Blacksburg, VA
06/2006 – 06/2013 **Associate Professor**, Grado Department of Industrial and Systems Engineering, Virginia Tech, Blacksburg, VA
08/2000 – 06/2006 **Assistant Professor**, Department of Industrial and Systems Engineering, Virginia Tech, Blacksburg VA
08/2002 – 07/2014 **Primary Faculty**, Virginia Tech / Wake Forest School of Biomedical Engineering and Science, Blacksburg, VA
10/2008 – present **Guest Professor**, Ghent University, Department of Industrial Management, Ghent, Belgium

OTHER EXPERIENCES

2010 – Present Associate Editor, *Annals of Biomedical Engineering (Springer)*
2015 – Present Board of Consulting Editor, *Journal of Biomechanics (Elsevier)*
2016 – Present Editorial Board, *Ergonomics (Taylor & Francis)*
2016 – Present Editorial Board, *Sensors (MDPI)*
2010 – Present NIH Scientific Review Board, Musculoskeletal Rehabilitation Sciences (MRS)
2010 – 2016 Editor, *Ergonomics (Taylor & Francis)*
2009 – 2010 NASA Peer Review Panel, Sensorimotor Crew Health
2002 – 2010 CDC/NIOSH/NORA Peer Review Panel, 2002 - 2010
2008 – 2009 Health Research Council of New Zealand, Review Panel
2007 – 2008 US Department of Education (NIDRR), Review Committee
2006 – 2007 Netherlands Organisation for Health Research Committee
2002 – 2005 Australian Research Council (ARC) Member-Discovery Project
2004 – Present Member, Institute of Ergonomics and Human Factors, UK
1999 – Present Member, Human Factors and Ergonomics Society, USA

MEMBERSHIPS

2010 – Present Editorial Member, Biomedical Engineering Society, USA
2004 – Present Member, Institute of Ergonomics and Human Factors, UK

HONORS AND AWARDS

International/National Awards:

- Alexander C. Williams, Jr., Design Award (HFES, 2008)
- ADA Disability Research Award (2007)
- Liberty Mutual Best Paper Award (Published in *Ergonomics*, 2003-2004) (2005)
- The Whitaker Foundation Biomedical Engineering Grant Investigator (2003)
- CDC/NIH Special Emphasis Research Career Award (SERCA K01) (2001)
- ARCS Scholar, Achievement Rewards for College Scientists (1999)

University Awards:

- Dean's Award of Excellence in Research, Virginia Tech (2013)
- College of Engineering Faculty Fellow, Virginia Tech (2008)
- Dean's Award of Excellence for Outstanding Assistant Professor Virginia Tech (2003)
- Virginia Tech Center for Gerontology Faculty Affiliate Research Award (2002)

RESEARCH AND TEACHING INTERESTS

- Fall risk prediction and assessments
- Gait and posture, postural control, and nonlinear dynamics
- Wireless wearable sensors for continuous, non-invasive gait monitoring to accurately detect and study fall events and predict future falls in the elderly population
- Interventions (nutrition/exercise) to reduce falls in older adults
- Occupational fall prevention training
- Biomechanics of Human Locomotion, Occupational Biomechanics
- Ergonomics and Human Factors, Design of Experiments

RESEARCH AND SCHOLARSHIP

Funded Research Projects and Grants

1. Non-Intrusive Multi-patient Fall-Risk Monitoring: NSF- Information and Intelligent Systems (IIS) and Smart Health and Wellbeing - PI: Lockhart. This grant will support graduate and undergraduate students to finalize the design of the stability monitor. (\$72,462: 5/15 – 6/17)
2. Abbott -Effects of Vitamin D3 Supplementation on Dynamic Stability: Abbott Nutrition – PI: Lockhart. This grant will support the study of nutritional supplementation on the risk of fall among the community dwelling elderly. (\$122,250: 7/1/15 – 6/30/18)
3. DSM - Effects of Vitamin D3 Supplementation on Dynamic Stability: DSM – PI: Lockhart. This is an international grant supporting the Abbott research with EU interests in reducing the risk of fall among the community dwelling elderly. (\$108,249: 7/1/15 – 6/30/18)

4. Smart and Connected Health (SCH) PI and Aspiring PI Meeting 2015: NSF – PI: Lockhart. This is a grant to gather wearable biosensor community to help the next generation of researchers in the biosensor area. (\$99,392: 4/01/15 - 3/31/16)
5. Effect of L- Dihydroxyphenylserine (L-DOPS, Northera) a Central and Peripheral Norepinephrine Agent on Locomotion, Postural Stability (Balance), and Fall Reduction in Parkinson Disease (PD): Lundbeck – PI (ASU): Lockhart and PI (BNI): Lieberman. This study will for the first time test a drug that can mitigate syncopal falls in the elderly. (\$273,482-BNI, ASU - \$65,373): 3/01/15 – 2/28/17).
6. “Non-Intrusive Multi-Patient Fall-Risk Monitoring in Health Care Facilities,” NSF- Information and Intelligent Systems (IIS) and Smart Health and Wellbeing - 1065442 and 1065262 (\$1,200,000: 8/01/2011 to 7/31/2016) PI: Lockhart (65%: \$750,000) CoPI: Lach Co-I: Roberto and Ha.
7. “Low Cost Gait and Frailty Assessment on Smartphone Platforms,” NSF-ICorps- 1343079: PI: Thurmon Lockhart (\$50,000: 7/01/13 to 1/31/2014).
8. “NSF REU Supplement”- SHB: Medium: Collaborative Research: Non-Intrusive Multi-Patient Fall-Risk Monitoring In Health Care Facilities. PI: Lockhart -50%, Ha-50% (\$82,000: 8/01/2012 to 7/31/2015).
9. “Effects of Vitamin D3 on Muscle function, Stability, Gait, and Activity in Assisted Living Residents,” PI: Thurmon Lockhart (\$216,000: 08/01/2015 to 7/31/2017).
10. “Effects of Localized Muscle Fatigue on Risk of Occupational Slips and Falls,” CDC/NIOSH – R01-OH009222 (\$1,196,460: 9/01/09 – 8/31/14). PI: Lockhart (80%: \$957,168) Co-I: Nussbaum (20%).
11. “Falling Man Scenario,” Los Alamos National Security and Pantex – (\$473,732: 8/01/2011 to 12/19/2014). PI: Lockhart (50%), Co-PIs: Duma and Kemper.
12. “Active and Passive Gait Perturbation Systems to Improve Fall Risk Assessment,” James A. Haley Veteran’s Hospital – PI: Lockhart (\$88,592: 10/01/2012 to 9/30/2015 to support Dr. M. Jongprasithporn in Tampa VA Hospital).
13. “Slip Simulators: Design and Application,” Los Alamos National Security – 102733-001-10 (\$43,914: 8/04/2010 to 9/30/2012). PI: Lockhart.
14. “Safety and Ergonomics Training”. NIOSH. PI: M.A. Nussbaum (36%); Co-Is: M.J. Agnew (5%), J.G. Casali (5%), B. Kleiner (3%), T. Lockhart (3%: \$14,121), T. Smith-Jackson (25%), W.W. Winchester (3%), and D. Young (20%). \$470,703; 07/01/11 – 06/30/16.

15. "Continuous Non-Invasive Gait Analysis and Fall-Risk Assessment," NSF-CBET-075605 (\$450,000: 4/01/08 to 3/31/2011). VT-PI: Lockhart (100%: \$225,000).
16. "Robust Dexterous RMMV Tasks," Office of Naval Research (ONR), MCM Advanced Flight Mission Package Program (\$745,446: 1-01-10 to 5-01-11). PI: Sturges (50%), Co-PI: Lockhart (50%: \$372,723).
17. "Occupational Safety and Health Training Grant". NIOSH-T01 OH008613. (\$344,340; 07/01/06-6/30/11). PI: Nussbaum, Co-Is: Casali, Kleiner, Lockhart, Smith-Jackson, Winchester (4%: \$13,773).
18. "Meeting Mandated Manning Requirements Through Effort Leveling," Office of Naval Research (ONR), MCM System for Combat Ship Advanced Flight Mission (\$937,265: 12-01-07 to 12-31-09). PI: Sturges (50%), Co-PI: Lockhart (50%: \$468,633).
19. "Older Driver Naturalistic Observation," Virginia Tech Transportation Institute - VTTI (\$280,000: 5/01/07 – 4/30/09). PI: Antin, Co-PI: Lockhart (25%: \$70,000).
20. "Development and Testing of a Fall Arresting System," University of Kentucky and Four Season Roofing (\$44,338: 6/15/07 to 5/31/08). PI: Lockhart (100%).
21. "Non-intrusive Locomotion and Gait Stability Analysis Monitoring System for the Elderly," NIH/NIA -1R43AG029721 (\$99,771: 9-15-2007 -8-31-2008). PI: Saxena [AFrame], VT-PI: Lockhart (100%).
22. "Hyperstereopsis Digital Compensation Mechanisms," ITT Night Vision – 082301 (\$298,153: 4-14-08 – 8/31/08). VT-PI: Lockhart (75%: \$223,614), Riverstone PI: Inge.
23. "Systems Safety Approach for Driver Competency and Safety Training for UPS Driver Delivery Providers," United Parcel Service-DOL (\$450,000: 6-01-06 to 5-31-08). PI: Smith-Jackson, Co-PI: Lockhart (11.11%: \$49,500).
24. "Orthotics Fall Intervention For Older Adults," VCOM/Harvey Peters Foundation (\$50,000: 3/01/07 – 6/30/08). PI: Lockhart (100%).
25. "Kinetic Learning Module for Training DSPS," United Parcel Service (\$16,505: 4/1/07-6/30/08). PI: Lockhart (100%).
26. "VT Post Baccalaureate Research and Education Program," NIH (1R25 GM066534-01A1: \$1,915,354: 6/01/03 – 5/31/08). PI: Smith, Co-investigator (mentor) (5%: \$95,767).
27. "VT Initiative for Maximizing Student Diversity," NIH (1R25 GM072767-01A2) (\$1,607,467: 01/11/2007–12/31/2010). PI: Smith, Co-investigator (mentor) (5%: \$80,373).

28. "Effects of Aging on the Biomechanics of Slips and Falls," Special Emphasis Research Career Award (SERCA – K01): (CDC) NIH/NIOSH, 1 K01 OH07450-01 (\$162,000, 7/1/01 – 6/30/04). PI: Lockhart (100%).
29. "Effects of Age-Related Changes in Hamstring Activation Rate and Heel Contact Velocity on the Biomechanics of Slips and Falls," The Thomas F & Kate Miller Jeffress, J604 (\$30,000, 1/1/01 – 12/31/01). PI: Lockhart
30. "Assessment of Aging Visual Characteristics," Toyota Motor Corporation. (\$118,000, 6/01/02 – 3/31/03). PI: Lockhart - 80%, Co-PI: Duma.
31. "Effects Of Age-Related Changes in Lower Extremity Muscular Strength and Motor Control Time on the Outcome of Slips and Falls," The Thomas F & Kate Miller Jeffress. (\$10,000, 1/1/02 – 12/31/02). PI: Lockhart (100%).
32. "Assessment of age-related visual and auditory warning design: Perceived urgency and Criticality," Toyota Motor Corporation (Japan). (\$119,725, 5/01/03 – 3/31/04) PI: Lockhart (80%, \$95,780), Co-PI: Casali.
33. "Effects of aging and load carrying on slip-induced fall accidents," The Johns Hopkins NIOSH Education and Research Center. (\$7,000 3/01/03 – 2/28/04). PI: Lockhart (100%).
34. "Effects Of Age-Related Sensory And Musculoskeletal Degradations On The Compensatory Gait Adaptation," The Thomas F & Kate Miller Jeffress. (\$10,000, 1/1/03 – 12/31/03). PI: Lockhart (100%).
35. "Biomechanical Analysis of slip-Induced Falls," The Whitaker Foundation. (\$210,738, 9-1-03 – 8-31-06). PI: Lockhart (100%).
36. "Evaluation of anti-glare items on visual performance of the elderly," Toyota Motor Corporation. (\$88,116, 6/01/05 – 3/31/06). PI: Lockhart (100%).
37. "Age-Related Effects of Work-Pace and Load Carrying on Risk of Slip Initiation," The Johns Hopkins NIOSH Education and Research Center. (\$10,000 1/01/05 – 12/31/06). PI: Lockhart (100%).
38. "Dynamic Visual Performance of Elderly Drivers," Toyota Motor Corporation. (\$95,724. 5/01/04 – 3/31/05). PI: Lockhart (100%).
39. "Clinical evaluation of low resistant machines on biomechanical response," Virginia's Philpott Manufacturing Extension Partnership - VPMEP. (\$4,946. 1/01/05 – 5/31/05). PI: Lockhart (100%).
40. "Effects of flat or fabricated glass articles on occupant vision in vehicles," PPG Industries, Inc. (\$15,000. 1/01/05 – 5/31/05). PI: Lockhart (100%).

41. "An Electronic Textile System for Gait Analysis," NSF/SBIR – Virginia Electronic Textile Systems, LLC. (\$33,000. 2/15/05 – 5/31/05). PI: Lockhart (100%).
42. "Occupational Safety and Health Training," CDC/NIOSH. Lockhart (Co-I – 10%, \$28,143), Nussbaum (PI) (\$281,434. 7/1/01 – 6/30/06).

Journal Publications

1. Rezvanian, S., and Lockhart, T.E., (2016), Towards Real-Time Detection of Freezing of Gait using Wavelet Transform on Wireless Accelerometer Data. *Sensors*, 16(5): 475. PMID: 27049389
2. Chang, WR, Leclercq, S, Lockhart, TE, and Haslam, R., (2016), State of science: Occupational slips, trips and falls on the same level. *Ergonomics*, DOI:10.1080/00140139.2016.1157214
3. Lieberman, A., Deep, A., and Lockhart T.E., (2015), Parkinson Disease, Vestibular Tract, a New Awareness. *EC Neurology*, 2.5 (2015): 237-238.
4. Fino, P.C., Frames, C.W., and Lockhart, T.E., (2015). Classifying step and spin turns using wireless gyroscopes and implications for fall risk assessments. *Sensors*, 15(5): 10676-85. PMID: 25954950
5. Parijat, P., Lockhart, T.E., and Liu, J., (2015). Effects of perturbation-based slip training using a virtual reality environment on slip-induced falls. *Annals of Biomedical Engineering*. 43 (4): 958-67. PMID:25245221
6. Ghosh, A.A., Lockhart, T. E., McIntosh, J., and Liu, J., (2015). Aging effect on detectability, criticality and urgency under various auditory conditions. *Transportation Research Part F: Traffic Psychology and Behaviour*, 31, 25-35.
7. Parijat, P., Lockhart, T.E., and Liu, J., (2015), EMG and kinematic responses to unexpected slips after slip training in virtual reality. *IEEE Transactions in Biomedical Engineering*, 62(2):593-9. PMID: 25296401
8. Fino, P., and Lockhart, T.E., (2015), Corner height influences center of mass kinematics and path trajectory during turning. *Journal of Biomechanics*, 48(1):104-12. PMID: 25468662 PMCID:PMC4274227
9. Fino, P. and Lockhart, T.E., (2014), Required coefficient of friction during turning at self-selected slow, normal, and fast walking speeds. *Journal of Biomechanics*, 47(6): 1395-1400. PMID: 24581815

10. Liu, J., & Lockhart, T.E. (2014) Development and evaluation of a prior-to-impact fall event detection algorithm, *IEEE Transactions on Biomedical Engineering*, 61(7): 2135-2140. PMID: 24718566
11. Liu, J., & Lockhart, T. E. (2014). Trunk angular kinematics during slip-induced backward falls and activities of daily living. *Journal of Biomechanical Engineering*, 136(10), 101005. PMID: 25033029
12. Zhang, J., Lockhart, T.E., and Soangra, R., (2014), Classifying Lower Extremity Muscle Fatigue during Walking using Machine Learning and Inertial Sensors. *Annals of Biomedical Engineering*, 42(3): 600-612. PMID: 24081829
13. Liu, J., Lockhart, T. E., and Kim, S., (2014), Reaction moment at the L5/S1 joint during a simulated forward slipping with a handheld load, *International Journal of Occupational Safety and Ergonomics* , 20(3): 429-436. PMID: 25189747
14. Lockhart, T.E., Soangra, R., and Frames C., (2014), Fall risk assessment among community dwelling elderly using wearable wireless sensors, *SPIE Defense and Security*, 90911J-90911J-7.
15. Soangra, R., Lockhart, T.E., Lach, J., and Abdel-Rahman, E., (2013), Effects of hemodialysis therapy on sit-to-walk characteristics in End Stage Renal Disease patients. *Annals of Biomedical Engineering*, 41,4:795-805
16. Liu, J, Lockhart TE (2013), Aging Effect on Foot Dynamics during Unexpected Slips. *Clinical Research on Foot and Ankle*, 1: 107.
17. Yeoh, H., Lockhart, T.E., and Wu, X., (2013), Non-Fatal Occupational Falls on the Same Level. *Ergonomics*, 56,2: 153-165.
18. Liu, J., and Lockhart, T.E., (2013), Local dynamic stability changes associated with load carrying. *Safety and Health at Work*, 4,1: 46-51. PMID: 23515183
19. Yeoh, H., Lockhart, T.E., and Wu, X., (2013), Nonfatal Occupational Falls Among U.S. healthcare Workers, 2008-2010. *Workplace Health & Safety*, 61,1: 1-6. PMID: 23281604
20. Lockhart, T.E., and Stergiou, N., (2013), New Perspectives in Human Movement Variability. *Annals of Biomedical Engineering*, Vol 41:8, 1593-1594.
21. Mansfield M., Haslam R., Young M., Hignett S., So R., Lockhart T.E., Bao S., Stanton N., Chang W., (2013), Ergonomic vs. Ergonomics: acknowledging the etymology. *Ergonomics*, 56(12):1793-4.
22. Wu, X., Lockhart, T.E., & Yeoh, H., (2012), Effects of obesity on slip-induced fall risks among young male adults. *Journal of Biomechanics*, 45;6: 1042-1047.

23. Haynes, C., Lockhart, T.E., (2012), Evaluation of gait and slip parameters for adults with intellectual disability. *Journal of Biomechanics*. 45: 2337-2341.
24. Parijat, P., and Lockhart, T.E., (2012), Effects of moveable platform training in preventing slip-induced falls in older adults. *Annals of Biomedical Engineering*, 40(5):1111-21.
25. Liu, J., Zhang, X., and Lockhart, T.E., (2012), Fall risk assessments based on postural and dynamic stability using inertial measurement unit. *Safety and Health at Work*, 3: 192-198.
26. Kim, S., and Lockhart, T.E., (2012), Lower Limb Control and Mobility Following Exercise Training. *Journal of Neuroengineering and Rehabilitation*, 15;9(1).
27. Suwittayaruk, P., Van Goubergen, D., and Lockhart T.E., (2012), A preliminary study on pace rating using video technology. *Human Factors and Ergonomics in Manufacturing & Service Industries*. doi: 10.1002/hfm.20510
28. Park, S.H., Kim, S., Lockhart, T.E., Yoon, H.Y., and Lee, K., (2011), Effects of Sound on Postural Stability During Standing. *Journal of Neuroengineering and Rehabilitation*, 8:67.
29. Lockhart, T.E., Antin, J., Stanley, L., and Guo, F., (2011), Comparing the impairment profiles of older drivers and non-drivers: Toward the development of a fitness-to-drive model. *Safety Science*, 50: 333-341.
30. Liu, J., and Lockhart, T.E., (2011), Automatic individual calibration in fall detection: an integrative ambulatory measurement framework. *Computer Methods in Biomechanics and Biomedical Engineering*, DOI: 10.1080/ 10255842. 2011. 627329.
31. Lockhart T.E., Barth A, Zhang X, Songra R, Abdel-Rahman E, Lach J. (2010), Portable, non-invasive fall risk assessment in end stage renal disease patients on hemodialysis, *ACM Trans Comput Hum Interact*. 2010: 84-93.
32. Lockhart, T.E., and Shi, W., (2010), Effects of Age on Dynamic Accommodation. *Ergonomics*, 53:7, 892-903.
33. Kim, S., and Lockhart, T.E., (2010), Effects of 8 weeks of balance or weight training for the independently living elderly on the outcomes of induced slips. *International Journal of Rehabilitation Research*, 33(1): 49-55.
34. Kim, S., Lockhart, T.E., and Nam, C.S., (2010), Leg Strength Comparison between younger and middle-age adults. *International Journal of Industrial Ergonomics*, 40: 315-320.

35. Liu, J., and Lockhart, T.E., (2009), Age-related joint moment characteristics during normal gait and successful reactive recovery from unexpected slip perturbations. *Gait and Posture*, 30, 276-281.
36. Lockhart, T.E., Kim, S., Kapur, R., and Jarrott, S., (2009), Evaluation of gait characteristics and ground reaction forces of cognitively declined older adults with emphasis on slip-induced fall accidents. *Assistive Technology*, 21(4):188-195.
37. Kim S., and Lockhart, T.E., Roberto, K., (2009), The effects of 8-week balance training or weight training for the elderly on fear of falling measures and social activity levels. *Quality in Ageing*, 10(4), 37-48.
38. Lee, M., Roan, M., Smith, B., and Lockhart, T.E., (2009), Gait analysis to classify external load conditions using linear discriminant analysis. *Human Movement Science*, 28, 226-235.
39. Parijat, P., and Lockhart, T.E., (2008), Effects of lower extremity muscle fatigue on the outcomes of slip-induced falls. *Ergonomics*, 51:12, 1873-1884.
40. Lockhart, T.E., and Liu, J., (2008), Differentiating fall-prone and healthy adults using local dynamic stability. *Ergonomics*, 51:12, 1860-1872.
41. Parijat, P., and Lockhart, T.E., (2008), Effects of quadriceps fatigue on the biomechanics of gait and slip propensity. *Gait and Posture*, 28, 568-573.
42. Liu, J., Lockhart, T.E., Jones, M., and Martin, T., (2008), Local Dynamic Stability Assessment of Motion impaired Elderly using Electronic Textile Pants. *IEEE Transactions in Automation Science and Engineering*, 5:4, 696-702.
43. Granata K.P., and Lockhart T.E., (2008), Dynamic stability differences in fall-prone and healthy adults. *J. Electromyography & Kinesiology*, 18, 172-178.
44. Lockhart, T.E., (2008), An integrated approach towards identifying age-related mechanisms of slip initiated falls. *J. Electromyography & Kinesiology*, 18, 205-217.
45. Kim, S., and Lockhart, T.E., (2008), The Effects of 10% Front Load Carriage on the Likelihood of Slips and Falls. *Industrial Health*, 46, 32-39.
46. Shi, W., Lockhart, T.E., Arbab, M., (2008), Tinted windshield and its effects on aging drivers' visual acuity and glare response. *Safety Science*, 46, 1223-1233.

47. Quek, F., Roger, E., and Lockhart, T.E., (2008), As Go the Feet: On the Estimation of Attentional Focus from Stance. *ACM Trans Comput Hum Interact.* 2008: 97-104.
48. Lockhart, T.E, Spaulding J., and Park, S. H., (2007), Age-related slip avoidance strategy while walking over a known slippery floor surface. *Gait & Posture*, 26:1, 142-149.
49. Parijat P, Lockhart T (2007). Effects of quadriceps fatigue on knee joint kinetics during slip induced falls. *Journal of Biomechanics* 40: Supplement 2: pg S112.
50. Liu, J, and Lockhart, T.E., (2006), Comparison of 3D joint moments using local and global inverse dynamics approaches among three different age groups. *Gait and Posture*, 23:4, 480-485.
51. Lockhart, T.E., and Kim, S.W., (2006), Relationship Between Hamstring Activation Rate and Heel Contact Velocity: Factors Influencing Age-Related Slip-Induced Falls. *Gait and Posture*, 24:1, 23-34.
52. Lockhart, T.E., (2006), Biodynamics: Why the Wirewalker Doesn't Fall by Bruce J. West and Lori A. Griffin (Review). *American Journal of Human Biology*, 18, 1, 155-156.
53. Lockhart, T.E., Atsumi, B., Ghosh, A., Mekaroonreung, H., and Spaulding, J., (2006), Effects of planar and non-planar driver-side mirrors on age-related discomfort-glare responses. *Safety Science*, 44, 187 – 195.
54. Kim, S., Yoon, H., and Lockhart, T.E., (2006), Comparison of spatio-temporal characteristics between young and old adults while walking: Factors influencing the likelihood of slip-initiation. *Journal of Ergonomics Society of Korea*, 25:1, 43-49.
55. Granata, K.P., and Lockhart, T.E., (2006), Group differences among fall-prone individuals and healthy old and younger counterparts utilizing nonlinear stability measures. *Journal of Biomechanics*, 39, S1, 89.
56. Lockhart, T.E., and Liu, J., (2006), Effects of aging on lower extremity joint torque and muscle activation patterns during slip-induced falls. *Journal of Biomechanics*, 39, S1 87.
57. Lockhart, T.E., Smith, J.L., and Woldstad, J.C., (2005), Effects of aging on the biomechanics of slips and falls. *Human Factors*, 47:4, 708-729.
58. Lockhart, T.E., Grönqvist, R., and Chang, W.R., (2005), A Special Issue on Slip, Trips, and Falls. *Safety Science*, 43, 355-357

59. Yoon, H.Y., and Lockhart, T.E., (2005), Nonfatal occupational injuries associated with slips and falls in the US. *International Journal of Industrial Ergonomics*, 36, 83-92.
60. Kim, S.W., and Lockhart, T.E., (2005), Relationship between age-related gait adaptations and required coefficient of friction. *Safety Science*, 43, 425-436.
61. James, C. R., Sizer, P. S., Starch, D. W., Lockhart, T.E., and Slauterbeck, J. R., (2004), Gender differences among sagittal plane knee kinematic and ground reaction force characteristics during a rapid sprint and cut maneuver. *Research Quarterly Exercise Sport*, 75:1, 31-38.
62. Edmison, J., Jones, M., Lockhart T., and Martin T., (2004), An e-textile system for motion analysis. *Stud Health Technology Informatics*. 108:292-301.
63. Lockhart, T.E., Woldstad, J.C., and Smith, J.L., (2003), Effects of age-related gait changes on biomechanics of slips and falls. *Ergonomics*, 46:12 1136-1160.
64. Lockhart, T.E., (2002), Relationship between heel acceleration and friction utilization during slipping among young and older adults. *Gait & Posture*, 16, S1 26-27.
65. Lockhart, T.E., (2002), Relationship between postural control and slip response among different age groups. *Gait & Posture*, 16, S1 25-26.
66. Lockhart, T. E., Woldstad J. C., and Smith J. L., (2002), "Assessment of slip severity among different age groups," Metrology of Pedestrian Locomotion and Slip Resistance. American Society for Testing and Materials, *ASTM STP*, 1424, 17-32.
67. Lockhart, T.E., Woldstad, J.C., Smith, J.L., and Ramsey, J.D., (2002), Effects of age related sensory degradation on perception of floor slipperiness and associated slip parameters, *Safety Science*, 40, 689-703.
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Invited/Keynote Presentations

1. The state of Science on Occupational Slips, Trips and Falls on the Same Level, the Proceedings of the International Conference on Fall Prevention and Protection 2013, National Institute of Occupational Safety and Health, Tokyo, Japan.
2. New Jersey State Safety Council's Occupational Safety and Health Conference – Kinetic Learning in Safety, May 12, 2011.
3. Consumers Energy: Local Guidance & Grass Roots Team Safety Summit, October 3, 2011.
4. Industrial Engineering Department, Dong-Ha University (Seoul Korea) - "Human Factors in Automotive Design" (Keynote Presentation March 29, 2005).
5. Prince of Songlka University (Thailand) – "Role of Industrial Engineers as a Human Factors Specialist" (Keynote Presentation, September, 3, 2003).
6. King Mongkut's University (Bangkok, Thailand) – "Ergonomics programs in academia" (Keynote Presentation, September, 1, 2003).
7. SAll, Industrial Engineering Conference, Puebla, Mexico – "From research to reality – Occupational Fall Prevention Training" (Keynote, November 3, 2007).

8. Keynote Address, 1st International Industrial Engineering Congress, UNAM, Mexico” (September, 25, 2008).

Invited Lectures

1. Invited lecture: “Shiftwork Health and Safety” Invited talk given to the Central Virginia Section of the American Industrial Hygiene Association (2000).
2. Invited lecture: “Biomechanics of slips and falls” Invited talk given to the Wake Forest University (2002).
3. Invited lecture: “Human Factors Research in Automobile Safety” invited talk given to Toyota Motor Corporation (Toyota Shi, Japan) (2003).
4. Korea (Han Yang University, Seoul Korea) – Ergonomics: Fall Safety (2004).
5. International Conference on Fall Prevention and Protection, Morgantown, WV May 18-20, 2010.
6. 2010 Norfolk Southern Mechanical Department Safety Chairperson Conference
7. Ergonomic Interventions and Research Workplace Musculoskeletal Disorder Rehabilitation and Prevention 2009.

Patents

1. Hip Inflatable Protection Bag (HIP-Bag), US Patent Application: 60/601,108 and 11/202,357.
2. A System and Method for Dynamically Enhancing Depth Perception in Head Borne Video Systems. Application filed: 8/26/2010-RatnerPrestia. US:12/861,988 PCT International Application No. PCT/US2011/048889.

Disclosures (pre-patent)

1. IMMU System Development, VTIP Disclosure No.: 07-075.
2. Ambulatory Monitoring System, VTIP Disclosure No.: 09-025.

Technical Reports

1. Sturges R., and Lockhart, T.E., (2009). Meeting Mandated Manning Requirements Through Effort Leveling. Office of Naval Research.
2. Lockhart T.E., and Jon Antin (2008). Older Driver Naturalistic Observation. Virginia Tech Transportation Institute.

3. Lockhart T.E., (2008). Development and Testing of a Fall Arresting System. University of Kentucky and Four Season Roofing.
4. Lockhart T.E., (2007). Non-intrusive Locomotion and Gait Stability Analysis Monitoring System for the Elderly. NIH/NIA.
5. Lockhart T.E., (2008). Hyperstereopsis Digital Compensation Mechanisms. ITT Night Vision.
6. Lockhart T.E., and Prakriti Parijat (2007). Kinetic Learning Module for STF Training DSPS. UPS.
7. Lockhart T.E., *Arka G., and Atsumi, B., (2005). Dynamic Visual Performance of Elderly Drivers. Toyota Motor Corporation.
8. Lockhart T.E., and *Liu, J., (2005). Clinical evaluation of low resistant machines on biomechanical response. VPMEP.
9. Lockhart T.E., and *Shi, W., (2005). Effects of flat or fabricated glass articles on occupant vision in vehicles. PPG Industries, Inc.
10. Lockhart T.E., Martin, T., and Jones, M., (2005). An Electronic Textile System for Gait Analysis. NSF/SBIR – Virginia Electronic Textile Systems, LLC.
11. Lockhart T.E., (2004). Age-Related Effects of Work-Pace and Load Carrying on Risk of Slip Initiation. The Johns Hopkins NIOSH Education and Research Center.
12. Lockhart T.E., and *Jian Liu (2004). Biomechanical Analyses of Slip-Induced Falls. Whitaker Foundation.
13. Lockhart T.E., (2004). Visual Requirements of Elderly Drivers. Toyota Motor Corporation.
14. Lockhart T.E., (2004). “Toyota Funds Virginia Tech Research on Elderly Driving.” The Virginia Engineer, Vol. LIII, 3, Number 5.
15. Lockhart T.E., *Kim, S.W., and *Liu, J., (2004). Effects of Aging on the Biomechanics of Slips and Falls. (CDC) NIH/NIOSH.

TEACHING AND ADVISING

Advising Activities

Chairman of Ph.D. Graduate Committee:

1. Sukwon Kim (2005), *Neuromusculoskeletal Training for Older Adults to Reduce the Likelihood of Slip Induced Fall Accidents.*
2. Thomas Davis (2005), *Effects of Stress, Coping Style, and Confidence on Basic Combat Training Performance, Discipline, and Attrition.*
3. Wen Shi (2007), *Age-Related Dynamic Accommodative Characteristics Associated with Light Intensity and Chromaticity.*
4. Jian Liu (2008), *Ambulatory Fall Detection with Integrative Ambulatory Measurement (IAM) Framework.*
5. Prakriti Parijat (2009), *Trainability of Recovery Responses in Older Adults to Prevent Slip-Induced Falls using Simulated Slip Training.*
6. Natakrit Yodpijit (2010), *The Effect of Age on Dark Focus Distance and Visual Information Transfer Rate.*
7. Manutchanok Jongprasithporn (2011), *The Age-Related Effects of Visual Input on Multi-Sensory Weighting Process During Locomotion and Unexpected Slips.*
8. Selina Zhang (2013), *Determinants of Gait and Fall Risk.*
9. Rahul Soangra (2014), Understanding variability in older adults using inertial sensors.
10. Jian Zhang (2014), Machine learning and prediction of fallers using wearable sensors.
11. Saba Rezvanian, MS (Chair: Ph.D. 2014-2018 - GRA) – Freezing of Gait Assessment using Wireless IMU Biosensors.
12. Victoria Smith, MS (Chair: Ph.D. 2014-2018 - GRA) – Cholinergic Interventions in Parkinson Disease.
13. Chris Frame, MS (Chair: Ph.D. 2015-2018 - GRA) – Effects of Dyskinesias on Postural Stability.
14. Seoung Kim (Chair: Ph.D. 2019 – GRA) – Movement Disorder Assessments.

Chairman of M.S. Graduate Committee:

1. Tanavadee Khuvasanont (2002), *Age-Related Ankle Strength Degradation and Effects on Slip-Induced Falls.*
2. Thomas Davis (2002), *Effects of Age on Stress and Biomechanics of Slips and Falls.*
3. Jeremy Spaulding (2003), *Effects of Age on Gait Parameters and Muscle Activity during Gait Adjustment.*
4. Sukwon Kim (2003), *Relationships between Hamstring Activation Rate and Biomechanics of Slip-Induced Falls among Young and Old.*
5. Srikrishnan Damodaran (2003), *Development of Gait Analysis Software.*
6. Haruetai Mekaroonreung (2003), *Trait-Based Individual Differences on Discomfort Glare Rating Responses and Related Visual Contrast Sensitivity.*
7. Keith Bishop (2003), *Predictor Variables Related to Falls in a Long-Term Care Environment.*
8. Jian Liu (2004), *Aging Effect on Successful Reactive-Recovery from Unexpected Slips: A 3D Lower Extremity Joint Moment Analysis.*
9. Jason Clark (2004), *Nighttime Driving Evaluation of the Effects of Disability and Discomfort Glare from Headlamps under Low and High Light Adaptation Levels.*
10. Pankaj Raj (2005), *Dynamic Visual Performance Characteristics of Elderly Drivers.*
11. Hyunghnam Kim (2005), *Floor Transitional Effects of Fall Accidents.*
12. Monica Glumm (2005), *Effects of Increases in Cognitive Load on Avoidance of Ground Hazards.*
13. Arka Ghosh (2005), *Effects of Multi-Modal Warning Systems on Elderly Drivers' Perceived Urgency and Comfort.*
14. Prakriti Parijat (2006), *Effects of Quadriceps Fatigue on Slips and Falls.*
15. Courtney Haynes (2008), *Evaluation of Gait and Slip Characteristics for Adults with Mental Retardation.*
16. Sean Pedrick (2011), *Fall Impact Force Modeling for Energetic Materials.*
17. Jessica Zhang (2012), *Evaluation of Sea-State Condition on Postural Stability.*

Postdoctoral Fellow Training and Research

1. Student: Chang Soo Nam, Ph.D. ISE, Virginia Tech
Employed: January – May 2004 Funded by Toyota Motor Corporation, Japan
Publication: 1. Employment after leaving postdoctoral position: Assistant professor, Department of Industrial Engineering, University of Arkansas.
2. Student: Sukwon Kim, Ph.D. ISE, Virginia Tech
Employed: January - May 2006 Funded by Whitaker Foundation Grant
Publications: 7. Employment after leaving postdoctoral position: Assistant professor (Tenure Track), Industrial Engineering, Texas A&M Commerce.
3. Student: Woohyung Park, Ph.D. ISE, Texas Tech
Employed: September, 2006 – May, 2007 Funded by Whitaker Foundation
Publication: 1. Employment after leaving postdoctoral position: Research Associate, Neuroscience Institute, School of Medicine, University of Pittsburgh.
4. Student: Jian Liu, Ph.D. ISE, Virginia Tech
Employed: August, 2008 - January, 2009 Funded by NSF
Publication: 7. Assistant professor (Tenure Track), Department of Health and Human Performance, University of Houston.
5. Student: Prakriti Parijat, Ph.D. ISE, Virginia Tech
Employed: August – October 2010 - Funded by CDC (NIOSH)
Publication: 4. Consultant Ergonomist and Human Factors Specialist, RECOUP Neuromuscular Rehabilitation Center, Bangalore India.
6. Student: Han T. Yeoh, Ph.D. ME, University of Dundee, UK
Employed: August 1, 2011- current, Funded by NSF
Publication: 2 submitted. currently at VT.
7. Student: Manutchanok Jongprasithporn, Ph.D. ISE, Virginia Tech
Employed: December 1, 2011- current, Funded by NSF
Publication: 2 submitted. Senior Researcher, Tampa VA Hospital.

Current Positions Held by the Masters and Doctoral Recipients

Doctoral Recipients

1. Thomas Davis (M.S., 2002, Ph.D., 2005): Chief, Weapons Division, US Army Research Laboratory (ARL), Human Research and Engineering Directorate, Redstone Arsenal, AL.
2. Sukwon Kim (M.S., 2003, Ph.D., 2005): Assistant Professor (Tenure Track), Chonbuk National University, Physical Education, Chonbuk, Korea.

3. Jian Liu (M.S., 2004, Ph.D., 2008): Assistant Professor (Tenure Track), University of Houston, Health and Human Performance, Houston, Tx.
4. Wen Shi (Ph.D., 2007): Senior Engineer, User Experience Designer, Global Consumer Design, Whirlpool Corporation, MI, USA.
5. Prakriti Parijat (M.S., 2006, Ph.D., 2009): Ergonomist and Human Factors Specialist, RECOUP Neuromuscular Rehabilitation Center, Bangalore India.
6. Nantakrit Yodpijit (Ph.D., 2010): Assistant Professor (Tenure Track), Faculty of Engineering, King Mongkut's University of Technology, North Bangkok, Thailand.
7. Selina Zhang (Ph.D., 2011): iOS Location and Motion Engineer, Wireless Technologies, Apple Inc.
8. Manutchanok Jongprasithporn (Ph.D., 2012): Research Scientist, VA Hospital, Tampa FL.
9. Rahul Soangra (Ph.D., 2014): Postdoctoral research associate, ASU, Tempe, AZ
10. Jian Zhang (Ph.D., 2014): Ligra, San Jose, CA

Masters Recipients

1. Tanavadee Khuvasanont (M.S., 2002): Safety Eng, Ministry of Labour, Thailand.
2. Jeremy Spaulding (M.S., 2003): Principle Human Factors Engineer, OSRAM SYLVANIA, Beverly MA.
3. Haruetai Mekaroonreung (M.S., 2003): Instructor (Non-tenure Track), Chulalongkorn University, Bangkok, Thailand.
4. Keith Bishop (M.S., 2003): Human Factors Engineer, Raytheon.
5. Jason Clark (M.S., 2004): Research Engineer, Jeppesen, Washington, DC, US.
6. Pankaj Raj (M.S., 2005): Microsoft, Usability Engineer, Issaquah, WA.
7. Monica Glumm (M.S., 2005): Researcher, US Army Research Laboratory.
8. Arka Gosh (M.S., 2005): Trader, Broadpoint Gleacher, NY, US.
9. Hyungnam Kim (M.S., 2005): Ph.D. Student, ISE-VT.
10. Sean Pedrick (M.S., 2011): Naval Surface Warfare Center, Dahlgren, VA.

Special Achievements of Former Undergraduate and Graduate Students

1. Thomas Davis (Ph.D.) – Modern-Day Technology Leader, 2011 Council of Engineering Deans of the Historically Black Colleges and Universities.
2. Jian Liu (Ph.D.) – Finalist of Student Paper Competition, HFES 2005.
3. Prakriti Parijat (M.S., Ph.D.) – Graduate Program Development Award, International Society of Occupational Ergonomics and Safety, June 2005.
4. Prakriti Parijat (M.S., Ph.D.) – Best Paper, Student Paper Competition, Human Factors and Ergonomic Society 2008 IETG.
5. Xiuyue (Selina) Zhang – ICTAS Doctoral Fellowship (2007-2011).
6. Jeremy Spaulding – US Patent (US 2009/0248419 A1: Speech recognition adjustment based on manual interaction, 2009).
7. Jason Clark and Jeremy Spaulding – US patent (US 2008/0126091 A1: Voice dialing using a rejection reference, 2008).

TEACHING (ASU Classes)

Spring 2015: BME 182 – Biomedical Engineering product Design II: 100 Undergraduate students, Instructor Evaluations (Part 2) – 4.64/5

Fall 2015: BME 598 – Human Factors and Ergonomics, 38 Graduate students, 4.47/5

Fall 2015: BME 101 – Biomedical Engineering, 17 students, 4.69/5

Course, Curriculum, and Program Development

1. ISE 6624 – Advanced Topics – Biomechanics of Human Locomotion. New course development integrating theory and practice of gait analysis. This course was taught as an advanced graduate level course in the Spring of 2007 and 2009.
2. ISE 5605, and 5606 – Human Factors in System Design. Developed class content of ISE 5605 and ISE 5606. Implemented reading list of the current journal articles relevant to Human Factors and System Design, thus, adding current Human Factors evaluation and assessment methods.
3. ISE 5614 – Human Physical Capabilities. Developed class contents including the bioinstrumentation section and signal processing modules for dynamic biomechanical modeling.
4. ISE 5154 – Applied Human Factors Engineering. Developed class content to include human systems integration methods to examine designs and reliability of a system.
5. ISE 3614 – Introduction to Human Factors Engineering. Class content was modified to include in-class laboratory practice in assessing human attributes.

6. ISE 4624 – Work Physiology. Developed course materials incorporated physiological laboratory exercises to course practicum.
7. ISE 3014 – Work Measurement and Methods Engineering. Modified class content integrating the traditional work measurement techniques and the state-of-art motion analysis system techniques.
8. ISE 5974 – Graduate Independent Study – Bioinstrumentation Methods. Develop a graduate independent study in the Spring of 2004.

Recognition and awards for teaching or advising effectiveness

Recognition from College of Engineering for the instructors whose overall rating was 3.60 or above for a semester (Fall 2003, Spring 2005, Fall 2005-1, Summer 2007, and Spring 2009).

SERVICE AND OUTREACH

International Programs Accomplishments

1. Thailand International Scientific Advisory Board – visited Northern and Southern Thailand universities and manufacturing companies as an expert in workplace ergonomics and safety in September of 2003.
2. Health Research Council of New Zealand, Peer Review Panel Member (2008).
3. Netherlands Organisation for Health Research and Development (ZonMw), Peer Review Panel Member (2006, 2009).
4. Australian Research Council (ARC) – Discovery Projects (2002-2005), Peer Review Panel Member (2002-2005).
5. President (2008-2009), International Society of Occupational Ergonomics and Safety.
6. Guest Professor of the Belgium's first Industrial Engineering Graduate program in Ghent University (2008-present).

International Research Collaborations

1. Collaborated with Toyota Motor Corporations in Japan for four years (2001-2005) and established international ergonomics standard for Intelligent Transportation System for elderly populations.
2. Established research partnership with Dr. Dirk Van Goubergen (2002-present) in Belgium - resulted in one journal publication and one book chapter.

3. Established research partnership with the scientists from Sweden to establish worldwide definition of “mobility” for the elderly leading to the International Standard of Mobility (2003-ongoing).
4. Established research partnership with Dr. Hoon Yong Yoon, at the Dong-A University, Dr. Sung Ha Park, at the Hannam University, and Dr. Min-Yong Park at the Hanyang University, Korea – resulted in two journal publications (2008).

Other International Activities

1. Participant of Thailand Government Job Safety Program (Summer, 2003).
2. Guest Professor at the Ghent University, Belgium (2008-present). Being the first graduate program in Industrial Engineering in Belgium, I am excited to disseminate the Ergonomics principles to the professional students in Belgium classrooms offering a three hour Human Factors and Ergonomics course per year.

Professional Service Accomplishments

1. ASTM F-13 Standards Committee (2001).
2. Advisor (2002-current): Mid-Eastern Alliance for Minority Participation (MEAMP).
3. Chapter President (Southern VA-2002) Korean-American Scientists and Engineers Association (KSEA).
4. Executive Committee: Treasurer, International Society for Occupational Ergonomics and Safety (2004-2006).
5. Program Chair, International Society of Occupational Ergonomics and Safety, June 27-29, 2005.
6. President (2008-2009), International Society for Occupational Ergonomics and Safety.
7. Technical Group Chair (2009-2010), Human Factors and Ergonomics Society: Industrial Ergonomics.
8. HFES Accreditation committee member (2011- present).

Other Service to One’s Profession or Field (service on committees)

1. National Institute of Health (NIH) Scientific Review Board (2010-2016), Musculoskeletal Rehabilitation Sciences.

2. Peer Review Panel Member for CDC (NIOSH), Evaluation of slips and fall research (April, 2002).
3. Peer Review Panel Member for CDC (NIOSH), Evaluation of Stilts on Walking Characteristics of Drywall Installation Tasks (January, 2003, 2009).
4. Peer Review Panel Member for NASA, 2009.
5. Peer Review Panel Member for US Department of Education (NIDRR), 2007.
6. Regular reviewer: *Journal of Biomechanics* (4-5/yr), *Gait & Posture* (4-5/yr), *Human Movement Science* (1-2/yr), *Ergonomics*, *Human Factors*, *Journal of Electromyography and Kinesiology*, *Applied Ergonomics*, *Journal of Biomechanical Engineering*, *Annals of Biomedical Engineering*, *Journal of Occupational and Environmental Hygiene*, and *Journal of Neurophysiology*- about 1/yr.

Professional Meetings, Panels, Workshops Led or Organized

1. Symposium Chair and Organizer in *International Conference on Computer-Aided Ergonomics and Safety (CAES)* – Special Session on Slips and Falls, Maui, Hawaii, July 20-August 1, 2001: Biomechanics of Slips and Falls, and Tribology of Slips and Falls (11 papers).
2. Session Chair, "Biomechanics of Slips and Falls", *CAES 2001* (August, 2001).
3. Session Chair, Human Factors and Ergonomic Society Annual Meeting, Baltimore, MD September, 2002.
4. Symposium Chair and Organizer, "Slips, Trips, and Falls," International Ergonomics Association (IEA), Seoul, Korea, August, 2003.
5. Session Chair, Human Factors and Ergonomic Society Annual Meeting, Denver Colorado, October 13-17, 2003.
6. Session Chair, Human Factors and Ergonomic Society Annual Meeting, New Orleans, October 15-17, 2004.
7. Symposium Chair and Organizer of Slips, Trips and Falls (STF Symposium), International Society of Occupational Ergonomics and Safety, June 27-29, 2005.
8. Session Chair, Human Factors and Ergonomic Society Annual Meeting, Orlando FL, September 25-27, 2005.
9. Program Chair, International Society of Occupational Ergonomics and Safety, June 27-29, 2005.

10. Session Chair, Human Factors and Ergonomic Society Annual Meeting, 2006, 2007, 2008.
11. Conference Chair, International Society of Occupational Ergonomics and Safety, June 2009.

Additional Outreach and Extension Activities and Outcomes

1. Extension Activities to reduce fall accidents among mentally handicapped individuals at Southwest Virginia Training Center, Hillsville, Virginia (2003 and present). Established "Health Awareness" program for mentally handicapped.
2. State-of-the-art fall prevention training method was developed and disseminated to various industries including the companies - UPS, Diageo, and Los Alamos National Security.

Outreach and Extension Publications

1. Nova Science Now, What will the future be like? Aired on 2013 on PBS.
2. "Fall Guys" (1997). *Discover*, Volume 18, November 11, 120-124.
3. "A Conversation with Thurmon Lockhart, Ph.D.," (2003). *Long-Term Care Interface*, Volume 4: 4, 32-40.
4. "Needs of Aging Drivers," (2006). *TRW*, Volume 1, pg 8-12.
5. "The Making of a UPS Driver," (2007). *Fortune*, November 12, 2007.
6. "Making Elderly Drivers Safer," (2004). *Industrial Engineer*, Vol. 36, Number 5, pp 18.
7. During 2003-2004, after a press release was written about our Locomotion Research work, *Associated Press* ran a national wire story regarding the work performed to reduce fall accidents among the elderly. It appeared in more than 60 newspapers, including *The Washington Post*, *USA today*, *Newsday*, the *Los Angeles Times*, and the *Baltimore Sun*. Recently, our research in ambulatory monitor for fall prediction among the elderly received some attention in MSNBC and Good Morning America (2008). Additionally, our work with the UPS (regarding our fall prevention training) has gained a great deal of interests and received some attention in the Fortune magazine.

Sample of Expert Witness/Testimony (since 2005)

1. Case: Fall accident (2005), Type: Injuries, Retained by: Campbell, Woods, Bagley, Emerson, Mcneer and Herndon, PLLC (Charleston, WV) Service: Expertwitness

2. Case: Overuse Injury (Ankle) and Falls in Railroad (2005-06), Type: Injuries, Retained by: Roger R. Cantrell, Attorney at Law (Greenup, Ky) Service: Expertwitness
3. Case: Fall accident (2005-06), Type: Injuries, Retained by: Gentry Locke Rakes & Moore (Roanoke, VA). Service: Expertwitness
4. Case: Applicability of handrail on stair descend accidents, Type: Injury, Retained by: Litten & Sipe L.L.P. (Harrisonburg, VA). Service: Expertwitness
5. Case: Fall accident (2007), Type: Injury, Retained by: Norris & Norris PLC (Nashville, TN). Service: Expertwitness
6. Case: Fall accident (2008), Type: Injury, Retained by: Florance Gordon Brown PLC (Richmond, VA). Service: Expertwitness
7. Case: Fall accident (2009), Type: Injury, Retained by: Woods & Rogers (Roanoke, VA). Service: Expertwitness
8. Case: Fall accident (2009), Type: Injury, Retained by: Dwight Chamberlin (Atlanta, GA). Service: Expertwitness (*Defendant*)