



## AMANDA STONE, Ph.D., CHFP

### PROFESSIONAL BIOGRAPHICAL OUTLINE

#### BACKGROUND

Dr. Stone received a Bachelor of Science in Bioengineering from Oregon State University, where she also completed coursework in orthopedic biomechanics, sports biomechanics, and biomaterials. She went on to work as the lead research assistant at the FORCE Lab in Bend, Oregon conducting research on injury mechanisms and biomechanical changes following an injury. She obtained her Ph.D. in Applied Physiology and Kinesiology from the University of Florida, focusing primarily on cognition and biomechanics following a lower extremity injury, but also examined whole body movement and internal joint loads during daily activities in persons with neurological diseases and orthopedic injuries. She received extensive training on the neurological and biomechanical factors that contribute to locomotion and locomotor adaptation. Throughout her graduate program, she presented her work at a variety of national and international conferences, and independently designed and executed studies related to gait, sensorimotor adaptation, and cognition. Following graduation, Dr. Stone performed her postdoctoral fellowship at the VA Puget Sound in conjunction with the University of Washington. Her work concentrated on preserving and enhancing mobility in persons with foot and leg impairments, including ankle osteoarthritis, diabetic neuropathy, and painful flat foot. Through her research career, Dr. Stone has gained extensive experience writing technical and nontechnical reports, and presenting her findings to a broad audience.

At ARCCA, Dr. Stone has specialized in several research areas, primarily focused on assessing human movement, tolerance thresholds, and material deformation properties. A subset of this research has utilized anthropomorphic test devices to quantify internal loading during both automotive and non-automotive scenarios. With this hands-on research, Dr. Stone is able to conduct more thorough analyses for a breadth of incidents. She is often sought for investigations involving a combination of biomechanics, human factors, and injury. For example, Dr. Stone applies her intersecting knowledge of physics, anatomy, and perception to provide detailed analyses of ambulatory-type incidents (e.g., slips and trips), and evaluates driver perception and reaction during challenging motor vehicle scenarios. Dr. Stone has conducted inspections in residential and commercial environments in relation to applicable codes/standards and premise liability. Additionally, Dr. Stone has dedicated training in video analysis techniques. Overall, Dr. Stone's expertise spans several avenues, including but not limited to severity analyses, human movement, injury mechanisms, human reaction and human factors, and code compliance.

#### SUMMARY OF EXPERIENCE

- Applies expertise in biomechanics and human factors to analyze slip, trip, and fall events
- Performs human factors and ergonomics analyses for both residential and commercial environments
- Evaluates occupant kinematics, injury tolerance, and human factors during automotive vehicle incidents
- Critically interprets scientific literature and performs comprehensive, succinct analysis and presentation of findings
- Evaluated gait and movement in injured and diseased individuals
- Investigated cognitive and biomechanical impact of injury and disease

## AREAS OF SPECIALTY

- Biomechanical Consulting
- Human Injury Tolerance and Mechanisms
- Vehicular Incident Reconstruction
- Slip/Trip/Fall Analysis
- Human Factors Analysis
- Video Analysis

## EDUCATION

- Doctor of Philosophy in Applied Physiology and Kinesiology, University of Florida, 2018
- Bachelor of Science in Bioengineering, Oregon State University, 2013

## PROFESSIONAL EXPERIENCE

### April 2021 – Present | ARCCA, Incorporated | Senior Biomechanist

- Assesses injury mechanisms in conjunction with ergonomics, human factors, and kinematics
- Evaluates slip, trip, and fall events utilizing knowledge of biomechanics and human factors
- Explores the relationship between accident kinematics, severity, and human response
- Performs injury causation analyses using knowledge of anatomy, physics, and biomechanical principles
- Investigates sports injury and defective sporting and recreational equipment
- Surveys forensic evidence, medical records, peer-reviewed literature, empirical testing, and computational modeling to assess incident severity, kinematics, and injury causation
- Generates reports that succinctly confirm or refute claimed injuries based on scientific analysis

### October 2018 – March 2021 | Center for Limb Loss and MoBility, VA Puget Sound Health Care | Postdoctoral Research Fellow

- Managed 1 collaborative study, and completed data collections for 2 grant-funded projects concerning foot and ankle biomechanics
- Mentored 2 graduate students and 1 undergraduate student regarding data collection and analysis techniques for motion capture and biplane fluoroscopy
- Publicized manuscripts and presentations in scientific and nonscientific settings
- Wrote or cowrote 3 government-funded grant proposals

### August 2014 – September 2018 | Applied Neuromechanics Lab, University of Florida | Graduate Research Assistant

- Conducted research centralized around musculoskeletal biomechanics, sensorimotor control, and cognition in a variety of populations, including healthy young and old adults, persons with neurological disorders, and individuals with ACL injuries
- Initiated 3 independent projects and 4 collaborative projects, managed 1 NIH funded project and assisted with 1 foundation funded project
- Collaborated with faculty and graduate students regarding data acquisition, analysis, and manuscript composition for studies
- Mentored 2 graduate students and 17 undergraduate students, one of which was funded by the University Scholars Program

### August 2014 – September 2018 | Applied Neuromechanics Lab, University of Florida | Undergraduate Volunteer and Intern Coordinator

- Managed 40 undergraduate volunteers (6-12 hours/week), four undergraduate interns (40 hours/week), and 3 Master's students (6-30 hours/week)
- Trained and supervised students on appropriate data collection and processing techniques
- Facilitated weekly journal clubs where students took turns presenting articles and leading discussion

### July 2013 – August 2014 | FORCE Lab, Oregon State University Cascades—Bend, OR | Lead Research Assistant

- Collaborated with physical therapists, orthopedic surgeons, engineers, and scientists to investigate injury mechanisms and performance following an orthopedic injury
- Mentored 3 undergraduate interns and aided in completion of their case studies
- Gained writing and presenting experience by co-authoring a research grant proposal, presenting at a regional conference, and contributing to the completion of a manuscript

### April 2013 – June 2013 | Biomechanics Laboratory, Oregon State University | Research Assistant

- Collaborated with Champion sportswear to assess qualitative and quantitative aspects of their equipment via motion capture

### June 2012 – August 2012 | Fluid Dynamics Research Center, Illinois Institute of Technology | Research Assistant

- National Science Foundation (NSF) Research Experience for Undergraduates (REU) Program
- Modeled vascular flow and analyzed transport of emboli from the heart to the head to predict probability of stroke

## CERTIFICATIONS AND CONTINUING EDUCATION

- Certified Human Factors Professional (CHFP) (Certificate No. 2522), *BCPE*
- Putting Ergonomics into Practice, *Ohio State University*, May 2024
- Video Examinations: Technical Issues, Legal Considerations, Workflows, and Best Practices, *Axon Investigate*, February 2024
- Video Examinations: Introduction and Technical Issues, *Axon Investigate*, February 2024
- Recon-3D Training Program, *Recon-3D*, February 2024
- Functional Capacity Evaluation Certification Course, *OccuPro*, December 2023
- Injuries, Anatomy, Biomechanics & Federal Regulation, *SAE International*, October 2023
- Human Factors in Traffic Crash Reconstruction, *Driver Research Institute*, September 2023
- International Building Code & More: Means of Egress, *International Code Council (ICC)*, March 2023
- OSHA #511 Occupational Safety and Health Standards for General Industry, *University of Washington Occupational Safety and Health Continuing Education*, November 2021

## PROFESSIONAL AFFILIATIONS AND SERVICE

- Member, National Association of Professional Accident Reconstruction Specialists (NAPARS)
- F1637 Task Group, American Society for Testing and Materials (ASTM) International

- Member, Washington Association of Technical Accident Investigators (WATAI)
- Committee Member, F13 Pedestrian/Walkway Safety and Footwear, American Society for Testing and Materials (ASTM) International
- Member, American Society of Biomechanics (ASB)
- Member, Biomedical Engineering Society (BMES)
- Member, Human Factors and Ergonomics Society (HFES)
- Member, Puget Sound Chapter of American Society of Safety Professionals (ASSP)
- Member, Risk and Insurance Management Society, Inc. (RIMS)
- Member, Society of Automotive Engineers (SAE) International
- Judge, SAE International's Chowhury STEM Innovation Contest
- Reviewer, Clinical Biomechanics
- Reviewer, Perceptual and Motor Skills
- Reviewer, Journal of Applied Biomechanics
- Reviewer, Journal of Biomechanics
- Reviewer, Sports Medicine
- Reviewer, Journal of Sports Medicine and Therapy
- Reviewer, Medicine & Science in Sports & Exercise

## PUBLICATIONS

1. **Stone, A. E.**, Morse, B. J., Jewel, C. M., Fijalkowski, R. J. (in progress). Head acceleration during low-speed rear-end collisions and risk of brain injury.
2. **Stone, A.E.**, Stender, C.J., Whittaker, E.C., Hahn, M.E., Rohr, E., Cowley, M.S., Sangeorzan, B.J., Ledoux, W.R. (2024). Ability of a Multi-Segment Foot Model to Measure Kinematic Differences in Neutrally Aligned, Planus, and Cavus Foot Types, *Gait & Posture*, 113: 452-461.
3. Wade, F., Baudendistel, S., **Stone, A.E.**, Roper, J., Raffegeau, T., Terza, M., Hass, C. (2022). Locomotor adaptation training to prevent mobility disability. *Biomechanics*, 2(3): 395-420.
4. **Stone, A.E.**, Stender, C.J., Whittaker, E.C., Hahn, M.E., Rohr, E., Cowley, M.S., Sangeorzan, B.J., Ledoux, W.R. (2022). Ability of a Multi-Segment Foot Model to Measure Kinematic Differences in Neutrally Aligned, Planus, and Cavus Foot Types. Submitted.
5. **Stone, A.E.**, Altmann, L.J.P., Vaillancourt, D.E., Hass C.J. (2022). Unimpaired performance during cognitive and visual manipulations in persons with anterior cruciate ligament reconstruction compared to healthy adults. *Psychol Sport Exerc*, 60: 102144.
6. **Stone, A.E.**, Hockman, A.C., Roper, J.A., Hass, C.J. (2021). Incremental visual occlusion during split-belt treadmill walking has no gradient effect on adaptation or retention. *Percept Mot Ski*, 128(6): 2490-2506.
7. **Stone, A.E.**, Shofer, J.B., Stender, C.J., Whittaker, E.C., Hahn, M.E., Sangeorzan, B.J., Ledoux, W.L. (2021). Ankle fusion and replacement gait similar post-surgery, but still exhibit differences versus controls regardless of footwear. *J Orthop Res*, 39(11): 2506-2518.
8. Roper, J.R., **Stone, A.E.**, Raffegeau, T.E., Terza, M.J., Altmann, L.J., Hass, C.J. (2021). Higher relative effort of the knee relates to faster adaptation in older adults at risk for mobility disability. *Exp Gerontol*, 144: 111192.
9. **Stone, A.E.**, Hass, C.J. (2020). Lower extremity prism adaptation in individuals with anterior cruciate ligament reconstruction. *Clin Biomech*, 80: 105147.

10. **Stone, A.E.**, Terza, M.J., Raffegau, T.E., Hass., C.J. (2019). Walking through the looking glass: Adapting gait patterns with mirror feedback. *J Biomech*, 83: 104-109.
11. **Stone, A.E.**, Roper, J.A., Herman, D., Hass, C.J. (2018). Cognitive performance and locomotor adaptation in persons with anterior cruciate ligament reconstruction. *Neurorehabil Neural Repair*, 32: 568-577.
12. Pollard, C.D., Norcross, M.F., Johnson, S.T., **Stone, A.E.**, Chang, E., Hoffman, M.A. (2018). A biomechanical comparison of dominant and non-dominant limbs during a side-step cutting task. *Sports Biomech*, 271-279.
13. **Stone, A. E.**, Skinner, J.W., Lee, H., Hass, C.J. (2017). A little trouble getting started: Initial slowness in Parkinson's disease step negotiation. *Gait Posture*, 57: 97-101.

## PRESENTATIONS

1. **Stone, A.E.** Biomechanics of Slips, Trips, and Falls [Presentation]. Mini Biomechanics School for Attorneys and Doctors, May 2024.
2. **Stone, A.E.** The Biomechanics of Slip, Trip, and Fall Claims as They Relate to Insurance Coverage and Liability [Presentation]. Oregon Claims Adjusters Association / Puget Sound Adjusters Association Annual Spring Symposium, April 2024.
3. McGrath, E., Shapirsteyn, N., **Stone, A. E.**, Stebner, K. Women in Trial [Panel]. San Francisco Trial Lawyers Association, April 2024.
4. **Stone, A. E.**, Morse, B. J. Holistic Analysis of Motor Vehicle Collisions [Presentation]. Washington State Department of Labor & Industries Investigations Conference October 2023.
5. **Stone, A. E.**, Morse, B. J. Biomechanics and Human Factors Behind a Slip or Trip [Presentation]. Washington State Department of Labor & Industries Investigations Conference October 2023.
6. **Stone, A. E.**, Grissom, I. Assessing causation through the synchronization of accident reconstruction and biomechanical engineering [Presentation]. Combined Claims Conference August 2023.
7. **Stone, A. E.** Factors to consider when assessing a slip or trip event [Presentation]. Southern California Fraud Investigators Association Annual Conference November 2022.
8. **Stone, A. E.**, Segal, A. D., Stender, C. J., Whittaker, E. C., Hahn, M. E., Orendurff, M. S., Sangeorzan, B. J., Ledoux, W. L. How does footwear affect gait in persons with ankle arthrodesis versus arthroplasty? [Podium]. American Society of Biomechanics Annual Conference July 2019.
9. **Stone, A. E.**, Hass, C. J. Individuals with ACLR are more accurate during initial prism exposure [Poster]. American Society of Biomechanics Annual Conference July 2019.
10. **Stone, A. E.**, Altmann, L. J. P., Hass, C. J. ACLR performance during novel angle-matching task and dual-task [Poster]. American Society of Biomechanics Annual Conference July 2019.
11. **Stone, A. E.**, Terza, M. J., Ludden, D. R., Raffegau, T. E., Krehbiel, L.M., Hass, C. J. Effect of Mirror Visual Feedback on Motor Adaptation and Learning [Thematic Poster]. American Society of Biomechanics Annual Conference August 2017.
12. **Stone, A., E.**, Terza, M. J., Roper, J. A., Hass, C. J. When You Adapt, You Retain: Locomotor Adaptation in ACLR and Implications for Rehabilitation [Poster]. International Society of Posture and Gait Research Annual Conference June 2017.
13. **Stone, A. E.**, Pello, M. L., Garfield, L. M., Barrozo, A. M., Ludden, D. R., Herman, D., Roper, J. A., Hass, C. J. Cognitive Acuity and Locomotor Adaptation in Persons with Anterior Cruciate Ligament Reconstruction [Poster]. American Society of Biomechanics Annual Conference August 2016.