REZA KOILER, Ph.D.

PROFESSIONAL BIOGRAPHICAL OUTLINE

BACKGROUND

Dr. Koiler earned a Bachelor of Science degree in Mechanical Engineering from the University of Tehran in Iran; a Master of Science degree in Mechanical Engineering and a second Master of Science degree in Biomedical Engineering from the University of Delaware; and a Ph.D. in Biomechanics and Movement Science from the University of Delaware.

Dr. Koiler has performed original research in the areas of assistive medical devices, occupant kinematics in chain collisions, robotic exoskeletons, functional electrical stimulation, transcranial magnetic stimulation, and functional neuroimaging (fNIRS, fMRI & EEG).

Dr. Koiler started his graduate training in Mechanical Engineering. During this period, Dr. Koiler developed skills in biomechanics, motion capture, and 3D musculoskeletal modeling of pathological gait, and conducted research on stroke gait rehabilitation using robotic exoskeletons. Dr. Koiler conducted two years of research in Shriners Hospital, working on his second master's degree in Biomedical Engineering using functional electrical stimulation (FES) to help improve walking and cycling in children with cerebral palsy (CP). For doctoral studies, Dr. Koiler joined the interdisciplinary program of Biomechanics and Movement Science to pursue his interest in neurodevelopment, neuromechanics and democratizing technology, through accessible tech development. Dr. Koiler developed and validated a cost-effective electromyography biofeedback device for improving walking function and associated motor learning and neuroplasticity in the prefrontal cortex. The results obtained from Dr. Koiler's research have been published in well-established and high impact factor journals.

Dr. Koiler has lectured in the Department of Kinesiology and Applied Physiology at the University of Delaware as an adjunct professor, as a guest lecturer in the Departments of Biomedical Engineering and Mechanical Engineering at the University of Delaware, and in the Department of Biomedical Engineering at Rowan University.

Dr. Koiler has conducted and assisted with the analyses of injury causation and accident reconstruction for projects, including premises liability, slips, trips, missteps, and subsequent falls, motor vehicle incidents, consumer devices, waterslides, trampolines, and amusement rides.

Dr. Koiler is a participating member of the ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear and ASTM F24 Committee on Amusement Rides and Devices. In his current role Dr. Koiler specializes in biomechanics, injury mechanism and causation, accident reconstruction, kinematics and kinetics, human factors, and slip/trip/fall analysis.

AREAS OF EXPERTISE

- Gait
- Slip/Trip/Fall Kinematics and Kinetics
- Biomechanics & Injury Causation
- Injury Mechanism Analysis
- Human Factors
- Slip Resistance
- Crash Data Retrieval (Certified 2024)
- Vehicular Accident Reconstruction
- Brain Injury
- Human Tolerance Thresholds
- Code Compliance

EDUCATION

- Ph.D., Biomechanics and Movement Science, University of Delaware, DE, 2021
- Master of Science, Biomedical Engineering, University of Delaware, DE, 2021
- Master of Science, Mechanical Engineering, University of Delaware, DE, 2015
- Bachelor of Science, Mechanical Engineering, University of Tehran, Iran, 2012

ADDITIONAL TRAINING

- Recon – 3D LiDAR Scanning Course, Online Training Course, 2025
- Crash Data Retrieval Analysis & Applications, Northwestern University Center for Public Safety 2024

PROFESSIONAL EXPERIENCE

September 2025 – Present | ARCCA, LLC | Senior Biomechanist

- Applies the principles of human factors and biomechanics to the anatomy and physiology of the human body to explore the cause, nature, and severity of injuries.
- Performs human factors and injury analysis of slips, trips and falls, including from ladders and stairs
- Performs analysis of building codes associated with personal injuries and premises liability.
- Performs crash injury analysis, injury mechanism determination, and crash kinematics
- Explores the relationship between accident kinematics and severity and human response
- Conducts vehicle and site inspections
- Performs research involving human subjects to understand human response, kinematics, kinetics, and head acceleration

August 2022 – October 2025 | CBE Consultants Inc | Associate Consultant

- Project expertise included premise liability, slips/trips/falls, and low speed motor vehicle incidents
- Project experience included evaluating injury causation and product liability issues for amusement rides and devices, trampolines, elevators, escalators, occupant kinematics and vehicle crashes, and industrial and construction equipment.
- Designed, collected and investigated head and neck loads and injury criteria due to head impact in Hybrid III crash test dummy
- Conducted Occupant Kinematic and Kinetic Analysis in Discrete vs Combined Chain Collisions, co-authored SAE Technical Paper 2024-01-2489.
- Collected and Analyzed INS/GNSS data & IMU data to assess water slide ride characteristics, performed 3D scene scanning, and inspected, retrieved, and analyzed data from vehicle (EDR) Event Data Recorders

2012 – 2022 | University of Delaware | Adjunct Assistant Professor

- Lectured in Research Methods (KAAP400) in the Department of Kinesiology and Applied Physiology.

2021–2022 | University of Delaware | Research Associate

- Performed research in the areas of Motor control and Biomechanics of human movement.

2021–2022 | University of Delaware | Lab Manager

- Managed day-to-day activities in the Developmental Motor Control Lab. Participated in Experimental Design, Grant Writing, Data Reduction, and Statistical Analysis of data. Mentored graduate and undergraduate students.

2012–2021 | University of Delaware | Teaching and Research Assistant

- Assisted in ongoing research and taught courses in Research Methods, Motor Control and Learning, Biomechanics, Bioengineering Mechanics, Heat Transfer, and Fluid Mechanics.

FUNDED RESEARCH PROJECTS

- Autism Research Institute award, Assessing TMS-mediated cortical modulation in ASD (Co-I, 2024)
- American Heart Association, Portable EMG biofeedback for post-stroke gait (PI, 20A01135, 2019)
- American Heart Association Stroke Tank, Portable EMG biofeedback for post-stroke gait (PI,2019)
- University of Delaware College of Health Sciences Equipment Award– fNIRS system for longitudinal neuroplasticity study (Co-author 2019)
- University of Delaware Center for Biomedical and Brain Imaging fMRI Pilot Grants, fMRI biomarkers in adolescents with ADHD (Co-author 2019)
- Delaware Bioscience CAT Grant, Neural biomarkers in stroke-gait biofeedback (Co-author 2017)

PUBLISHED BOOKS, BOOK CHAPTERS, AND EDITED VOLUMES

Getchell, N.; **Koiler, R.** (2021). Motor Behavior. In Oglesby, C. A., Henige, K., McLaughlin, D. W., & Stillwell, B. (Eds.). *Foundations of kinesiology* (pp. 219–235). Jones & Bartlett Learning.

PUBLISHED JOURNAL ARTICLES

Assadi, M., Bauer, S., **Koiler, R.**, Ally, R., Fischer, R., & Scott, R. (2025). The impact of bi-hemispheric iTBS stimulation of the IPL and IFG on social reciprocity in ASD. *Global Journal of Pediatrics & Neonatal Care*, *5*(4), 620

Daşdöğen, Ü., Awan, S. N., **Koilar, R.,** Getchell, N., Roth, D., & Verdolini-Abbott, K. (2025). Preliminary Data on Cortical and Acoustical Correlates of Voice Training Under Internal vs External Focus of Attention Conditions. *Journal of Voice*, *39*(4), 860

Bussone, W. R., **Koiler, R.**, Benda, J., Carney, N., Geffard, A., & Sam, S. (2024). *Occupant Kinematics During Chain-Collisions: Discrete vs Combined Collisions* (No. 2024-01-2489). SAE Technical Paper.

Assadi, M., **Koiler, R.**, Harrison-Goldman, T., Fischer, R., & Curtin, A. (2023). The effect of repetitive transcranial magnetic stimulation on social cognition in autism spectrum disorder: preliminary analysis of a pilot clinical trial. *Brain Network and Modulation*, *2*(4), 73-79.

Orsega-Smith, E., Ruggiero, L., Getchell, N ., Barmaki, R., Nichols, A., Varghese, J., DeLauder, R., & **Koiler, R.** (2023) Digital health games for older adults: Development, implementation, and programmatic implications of health game use in senior centers. *Journal of Elder Policy, 2(3), 127-161*

Bakhshipour, E., Plumb, M. S., **Koiler, R.**, & Getchell, N. (2022). Neural and Kinematic Metrics of Handwriting in Neurotypical Adults. *Journal of Behavioral and Brain Science*, *12*(9), 433-454.

Koiler, R., Schimmel, A., Bakhshipour, E., Shewokis, P. A., & Getchell, N. (2022). The Impact of Fidget Spinners on Fine Motor Skills in Individuals with and without ADHD: An Exploratory Analysis. *Journal of Behavioral and Brain Science*, *12*(3), 82-101.

Koiler, R., Bakhshipour, E., Glutting, J., Lalime, A., Kofa, D., & Getchell, N. (2021). Repurposing an EMG biofeedback device for gait rehabilitation: development, validity and reliability. *International Journal of Environmental Research and Public Health*, *18*(12), 6460.

Madani Tonekaboni, S. A., Abkar, R., & **Koiler, R**. (2012). On the study of viscoelastic Walters' B fluid in boundary layer flows. *Mathematical Problems in Engineering*, *2012*.

CONFERENCE PRESENTATION WITH PROCEEDINGS

Sharmin, S., **Koiler, R.**, Sadik, R., Bhattacharjee, A., Patre, P. R., Kullu, P., ... & Barmaki, R. L. (2024, January). Cognitive Engagement for STEM+ C Education: Investigating Serious Game Impact on Graph Structure Learning with fNIRS. In *2024 IEEE International Conference on Artificial Intelligence and eXtended and Virtual Reality (AIxVR)* (pp. 195-204). IEEE.

Koiler, R., Bakhshipour, E., Schimmel, A., Jones, A., Milla, K., Shewokis, P. A., & Getchell, N. (2021). Fidget Spinners May Decrease Prefrontal Cortex Activity During Cognitively Challenging Fine Motor Tasks. In *Advances in Neuroergonomics and Cognitive Engineering: Proceedings of the AHFE 2020 Virtual Conferences on Neuroergonomics and Cognitive Engineering, and Industrial Cognitive Ergonomics and Engineering Psychology, July 16-20, 2020, USA* (pp. 69-75). Springer International Publishing.

Bakhshipour, E., **Koiler, R.**, Milla, K., & Getchell, N. (2021). Understanding the cognitive demands of the purdue pegboard test: an fNIRs Study. In *Advances in Neuroergonomics and Cognitive Engineering: Proceedings of the AHFE 2020 Virtual Conferences on Neuroergonomics and Cognitive Engineering, and Industrial Cognitive Ergonomics and Engineering Psychology, July 16-20, 2020, USA* (pp. 55-61). Springer International Publishing.

CONFERENCE ABSTRACTS

Ruggiero, L., Orsega-Smith, E., Nichols, A., Varghese, J., Getchell, N., DeLauder, R., **Koiler, R.**, & Barmaki, R. (2022). Engaging Older Adults in Health Promotion: Pilot Study of Team Gameplay of an Educational Exergame in a Senior Center. *Innovation in Aging*, *6*(Suppl 1), 740–741.

Koiler, R, Bakhshipour, E, & Getchell, N. (2022). Using fNIRS to detect prefrontal cortex changes due to EMG Biofeedback walking and training in healthy adults. In *North American Society for the Psychology of Sport and Physical Activity conference*.

Getchell, N., Milla, K., Bakhshipour, E., **Koiler, R**. & Plumb, A. (2019). What lies beneath: Using fNIRS to explore cortical activation differences in children with and without developmental disabilities. In *International Motor Development Research Consortium: Vol. 1 (p. 75)*. *International Development Research Consortium, Newark, DE*.

Milla, K., Bakhshipour, E., Plumb, A., Bodt, B., **Koiler, R.**, & Getchell, N. (2019) Developmental differences in prefrontal cortex activity during 2D and 3D performance of the Tower of Hanoi puzzle. In *International Motor Development Research Consortium: Vol. 1 (p. 216). International Development Research Consortium, Newark, DE.*

Koiler, R., Bakhshipour, E., Milla, K. & Getchell, N. (2019). Validity, Reliability, and Sensitivity of a cost-effective, portable EMG-Biofeedback Device. In *International Motor Development Research Consortium: Vol. 1 (p. 184). International Development Research Consortium, Newark, DE.*

Koiler, R., Bakhshipour, E., Schimmel, A.G, Jones, A., Milla, K, & Getchell, N. Fidget Spinners Decrease Prefrontal Cortex Activity During Cognitively Challenging Fine Motor Tasks. In *International Motor Development Research Consortium: Vol. 1 (p. 216). International Development Research Consortium, Newark, DE.*

Milla, K., Bakhshipour, E., Plumb, A., **Koiler, R.**, & Getchell, N. (2019). Developmental Differences in Prefrontal Cortex Activation in an Executive Function Task with High vs. Low Motor Elements. In *Journal of Sport & Exercise Psychology (Vol. 41, pp. S17-S18).*

Bakhshipour, E., **Koiler, R.**, Milla, K., & Getchell, N. (2019). Understanding the Underlying Mechanisms of a Manual Dexterity Assessment using Functional Near-Infrared Spectroscopy. In *Journal of Sport & Exercise Psychology (Vol. 41, pp. S26-S26).*

Koiler, R., Bakhshipour, E., Milla, K., Plumb, M., & Getchell, N. (2019). Understanding Handwriting Pauses in the Detailed Assessment of Speed of Handwriting Test using fNIRS. In *Journal of Sport & Exercise Psychology (Vol. 41, pp. S38-S38).*

Ceja, K. M., Bakhshipour, E., **Koiler, R.**, & Getchell, N. (2018). Does oxygenation of prefrontal cortex change in a two versus three-dimensional Tower of Hanoi task. In *Frontiers in Human Neuroscience 2nd International Neuroergonomics Conference, Philadelphia, PA.*

PROFESSIONAL PRESENTATIONS

Nichols, A., Orsega-Smith, B., Ruggerio, L., Getchell., N, Varghese, j., Delauder, R. & **Koiler., R.** (2022) My Healthy Picks: From Recruitment to Practice. Presented at *the CEI summer scholars (August, online).*

Varghese, j., Nichols, A., Orsega-Smith, B., Ruggerio, L., Getchell., N, Delauder, R. & **Koiler., R.** (2022) My Healthy Picks: Using fNIRS to assess cognitive effects of an exergame on elderly. Presented at *the DE-INBRE summer scholars poster symposium (August, online).*

Koiler, R., Bakhshipour, E., & Getchell, N. (2021). Using fNIRS to assess neural adaptations due to EMG biofeedback training: Preliminary evidence for gait rehabilitation. Presented at *the 5th Assembly of the International Motor Development Research Consortium (September, online).*

Koiler, R., Bakhshipour, E., & Getchell, N. (2021). Using fNIRS to assess neural adaptations due to EMG biofeedback training: Preliminary evidence for gait rehabilitation. Presented at *the 5th Assembly of the International Motor Development Research Consortium (September, online).*

Bakhshipour, E., **Koiler, R.**, Getchell, N. & Plumb, M. (2021). Using innovative technologies to deconstruct handwriting pauses in the DASH 17+: Biomechanical and neural correlates of copy best and copy fast. Presented at *the 5th Assembly of the International Motor Development Research Consortium (September, online)*.

Bakhshipour, E., **Koiler, R.**, Getchell, N. & Plumb, M. (2021). Using innovative technologies to deconstruct handwriting pauses in the DASH 17+: Biomechanical and neural correlates of free-writing. Presented at *the 5th Assembly of the International Motor Development Research Consortium (September, online)*.

Bakhshipour, E., **Koiler, R.**, Plumb, M. & Getchell, N. (2021). Neural and kinematic characterization of handwriting in adults with and without ADHD. Presented at *the 5th Assembly of the International Motor Development Research Consortium (September, online)*.

Bakhshipour, E., Schimmel, A., **Koiler, R.**, & Getchell, N. (2020). Fidget spinners affect neural involvement and efficiency differently in individuals with and without ADHD. Presented at *the National Assembly of the International Motor Development Research Consortium (October)*.

Getchell, N., Milla, K., Bakhshipour, E., & **Koiler, R.** (2020). Developmental differences in cognitive efficiency and involvement among children and adults when solving the Tower of Hanoi puzzle. Presented at *the National Assembly of the International Motor Development Research Consortium (October)*.

Schimmel, A., **Koiler, R.**, Bakhshipour, E, & Getchell, N. (2020). Using fNIRS to investigate the effect of fidget spinners on cognitive and motor performance in adults with ADHD. Presented at *the North American Society for the Psychology of Sport and Physical Activity conference (June, online)*.

Getchell, N., Milla, K., Bakhshipour, E., **Koiler, R.** & Plumb, A. (2019). What lies beneath: Using fNIRS to explore cortical activation differences in children with and without developmental disabilities. Presented at *the 4th Assembly of the International Motor Development Research Consortium, Verona, Italy (September)*.

Milla, K., Bakhshipour, E., Plumb, A., Bodt, B., **Koiler, R.**, & Getchell, N. (2019) Developmental differences in prefrontal cortex activity during 2D and 3D performance of the Tower of Hanoi puzzle. Presented at *the 4th Assembly of the International Motor Development Research Consortium, Verona, Italy (September)*.

Koiler, R., Bakhshipour, E., Milla, K. & Getchell, N. (2019). Validity, Reliability, and Sensitivity of a cost-effective, portable EMG-Biofeedback Device. Presented at *the 4th Assembly of the International Motor Development Research Consortium, Veron, a Italy (September)*.

Koiler, R., Bakhshipour, E., Schimmel, A.G, Jones, A., Milla, K, & Getchell, N. Fidget Spinners Decrease Prefrontal Cortex Activity During Cognitively Challenging Fine Motor Tasks. Presented at *the 4th Assembly of the International Motor Development Research Consortium, Verona, Italy (September)* *Awarded best student poster.

Bakhshipour, E., **Koiler, R.**, Milla, K. & Getchell, N. (2019) Cortical substrates of a neuropsychological test of manual dexterity using Functional Near-Infrared Spectroscopy. Presented at *the 13th International Conference on Developmental Coordination Disorder, Jyväskylä, Finland (June)*.

Koiler, R., Bakhshipour, E., Milla, K., Plumb, A., & Getchell, N. (2019). Underlying Mechanisms of Handwriting Pauses in The Detailed Assessment of Speed of Handwriting Test Using fNIRS. Presented at *the 13th International Conference on Developmental Coordination Disorder, Jyväskylä, Finland (June)*.

Bakhshipour, E., **Koiler, R.**, Milla, K. & Getchell, N. (2019). Understanding the underlying mechanisms of a manual dexterity assessment using Functional Near-Infrared Spectroscopy. Presented at *the North American Society for the Psychology of Sport and Physical Activity Conference, Baltimore, MD (June)*.

Milla, K., Bakhshipour, E., Plumb, A., **Koiler, R.**, & Getchell, N. (2019). Developmental differences in prefrontal cortex activation in an executive function task with high vs. low motor elements. Presented at *the North American Society for the Psychology of Sport and Physical Activity Conference, Baltimore, MD (June)*.

Dasdogen, U., Verdolini-Abbott, K., Getchell, N., **Koiler, R.**, Bakhshipour, E., Awan, Sh. (2018). Behavioral and fNIRS Assessment of Internal vs. External Focus of Attention in Voice Learning. Presented at *the Viable And Operable Ideas For Child Equality International Conference, Bali, Indonesia (December)*.

Koiler, R., Bakhshipour, E., Milla, K., Plumb, A. & Getchell, N. (2019). Understanding handwriting pauses in the Detailed Assessment of Speed of Handwriting (DASH) using fNIRS. Presented at *the North American Society for the Psychology of Sport and Physical Activity Conference, Baltimore, MD (June)*.

Higginson, J., **Koiler, R**. (2014) Using Simulation to Understand Post-Stroke Muscle Function Due to Robotic Exoskeleton Training. Presented at *the World Congress of Biomechanics, 2014. (July)*.

Koiler, R., Higginson, J. (2014) Effect of Body Weight Supported Treadmill Training of Hemiparetic Patients on Plantarflexors Function. Presented at *the Conference on Gait and Clinical Movement Analysis Society (June)*.