

Nathan B. Fethke, PhD, CPE

Professor
 Department of Occupational and Environmental Health
 University of Iowa, College of Public Health

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Educational History

1996	BS, Biomedical Engineering	University of Iowa, Iowa City, IA
2000	MS, Biomedical Engineering	University of Iowa, Iowa City, IA
2006	PhD, Occupational and Environmental Health	University of Iowa, Iowa City, IA

Professional Certifications and Associations

2008-	Certified Professional Ergonomist (#1053), Board of Certification in Professional Ergonomics
1998-	Human Factors and Ergonomics Society (full member since ca. 2007)

Employment History

1996-1997	Engineering Internship	Fiskars, Inc., Middleton, WI
1997-1999	Graduate Research Assistant Biomedical Engineering	University of Iowa, Iowa City, IA
1998	Ergonomics Consultant (summer months only)	Fiskars UK Ltd., Brigend, Wales, UK
1999-2000	Ergonomics Engineer	Fiskars, Inc., Middleton, WI
2000-2002	Ergonomics Engineer	Fiskars Brands, Inc., Sauk City, WI
2002-2006	Graduate Research Assistant Occupational and Environmental Health	University of Iowa, Iowa City, IA
2006-2007	Assistant Research Scientist Occupational and Environmental Health	University of Iowa, Iowa City, IA
2007-2008	Assistant Professor (tenure track) Environmental Health	East Tennessee State University Johnson City, TN
2009-2015	Assistant Professor (tenure track) Occupational and Environmental Health	University of Iowa, Iowa City, IA
2009-2015	Assistant Professor (secondary, complimentary) Biomedical Engineering	University of Iowa, Iowa City, IA
2015-2023	Associate Professor (tenured) Occupational and Environmental Health	University of Iowa, Iowa City, IA
2015-2023t	Associate Professor (secondary, complimentary) Biomedical Engineering	University of Iowa, Iowa City, IA
2018-2023	Associate Professor (secondary, complimentary) Industrial & Systems Engineering	University of Iowa, Iowa City, IA
2023-	Professor (tenured) Occupational and Environmental Health	University of Iowa, Iowa City, IA

2023- Professor (secondary, complimentary) University of Iowa, Iowa City, IA
Industrial & Systems Engineering

Honors and Awards

2004 Jack Beno Award for Academic Achievement, Iowa Governor’s Safety Council

2007 Milford E. Barnes Award for Academic Achievement in Occupational and Environmental Health, University of Iowa College of Public Health

2007 Delta Omega Honorary Society in Public Health, University of Iowa College of Public Health

2018 Faculty Teaching Award, University of Iowa College of Public Health

2018 Bullard-Sherwood Award for Research to Practice (intervention category; honorable mention), National Institute for Occupational Safety and Health (NIOSH), for “*Revised Hand Activity Level Threshold Limit Value and Action Limits Driven by Results from Pooled Carpal Tunnel Syndrome Cohort Studies,*” with authors Burt SE, Meyers AR, and the many key contributors to the NIOSH Upper Limb Musculoskeletal Disorder Consortium.

2019 Inventor Award, University of Iowa

Teaching Assignments (University of Iowa)

As Primary Instructor

<u>Course Number</u>	<u>Course Name (years)</u>	<u>Audience</u>	<u>Enrollment*</u>
OEH:4310	Occupational Ergonomics: Principles (2009 to present)	Undergraduate/Graduate	15-20
OEH:6310	Occupational Ergonomics: Applications (2009-2020)	Graduate	3-5
OEH:7070	Interpreting OEH Research (2021 to present)	Graduate	5-10

*Typical numbers of students enrolled

As Team Instructor

<u>Course Number</u>	<u>Course Name (academic year)</u>	<u>Audience</u>	<u>Enrollment*</u>
CPH:7270	Principles of Scholarly Integrity (2017-2018)	Graduate/Professional	75
OEH:6460	Quantitative Exposure Assessment (2020 to present, 15% responsibility)	Graduate	5

*Typical numbers of students enrolled

As Frequent Guest Lecturer

<u>Course Number</u>	<u>Course Name</u>	<u>Audience</u>
OEH:5620	Occupational Health	Graduate
OEH:6110	Rural Health and Agricultural Medicine	Graduate
CPH:3400	Health, Work and the Environment	Undergraduate/Graduate

As Occasional Guest Lecturer

<u>Course Number</u>	<u>Course Name</u>	<u>Audience</u>
OEH:4540	Quantitative Exposure Assessment (before 2020)	Graduate
PTRS:7812	Biomedical Instrumentation and Measurement	Graduate
OEH:6530	Epidemiology of Occupational Injuries	Graduate
IE:3450	Ergonomics	Undergraduate/Graduate

BME:5640	Ergonomics of Occupational Injuries	Undergraduate/Graduate
OEH:6510	Environmental and Occupational Epidemiology	Graduate

Teaching Assignments (East Tennessee State University)

As Primary Instructor

<u>Course Number</u>	<u>Course Name</u>	<u>Audience</u>	<u>Enrollment*</u>
ENVH:4340	Occupational Health	Undergraduate	10
ENVH:5347	Ergonomics	Graduate	5
ENVH:5700	Industrial Hygiene & Safety	Graduate	5

*Typical numbers of students enrolled

Student Advising

MS Theses (as committee chair or co-chair)

Determan, Emily. MS in Occupational and Environmental Health, May 2013. Title: *Variability in muscle activity measurements among clinical ophthalmologists*. Post-graduate position: EHS Specialist, Dal-Tile Corporation, Dallas, TX.

Kersten, Joshua. MS in Occupational and Environmental Health, May 2017. Title: *Measuring manufacturing worker task duration with radio frequency identification technology*. Post-graduate position: Safety Specialist, Amazon.com, Inc., Romeoville, IL.

Huizinga, Nathan. MS in Occupational and Environmental Health, May 2018. Title: *Association between occupational injury and early termination of employment among manufacturing workers*. Post-graduate position: Project Consultant II (EHS focus), Colden Corporation, Albany, NY.

Roeder, Shamus. MS in Biomedical Engineering, May 2019. Title: *Thump, Womp, and Wiggle: Novel methods of identifying impacts within vibrating environments*. Post-graduate position: Biomedical Research Scientist, Intelligent Automation, Inc., Washington, DC.

Mitchard, Gordon. MS in Occupational and Environmental Health, August 2021. Title: *Association between home office ergonomics and musculoskeletal pain*. Post-graduate position: Ergonomics Consultant, VelocityEHS, Chicago, IL.

Guzowski, Tyler. MS in Occupational and Environmental Health, August 2021. Title: *Fatigue among restaurant workers*. Post-graduate position: PhD student, Occupational and Environmental Health, University of Iowa, Iowa City, IA.

Barnett, Alexander. MS in Occupational and Environmental Health. May 2024 expected. Title: TBD.

MS Committees (*denotes student at East Tennessee State University)

Kraska, Jenna*	MS in Kinesiology	May 2008
Herwig, Kelly	MS in Occupational and Environmental Health	December 2008
DeShaw, Jonathan	MS in Biomedical Engineering	May 2009
Shamsul, Ramesh	MS in Industrial Hygiene	July 2010
Schall Jr, Mark	MS in Industrial Engineering	December 2011
Meusch, John	MS in Biomedical Engineering	May 2012
Looft, John	MS in Biomedical Engineering	May 2012
Mills, Jessica	MS in Industrial Hygiene	May 2013
Green, Deirdre	MS in Industrial Hygiene	May 2013
Michael, John	MS in Biomedical Engineering	December 2017

Ricchio, Jessica	MS in Industrial Hygiene	May 2018
Stroh, Oliver	MS in Industrial & Systems Engineering	May 2019
Purdy, Matt	MS in Industrial Hygiene	May 2019
McNutt, Natalie	MS in Biomedical Engineering	in progress
Lillie, Matthew	MS in Industrial Hygiene (non-thesis)	May 2021
Estes, Rebekah	MS in Agricultural Safety and Health	August 2021
Boksa, Valerie	MS in Industrial & Systems Engineering	in progress
Smaellie, Emma	MS in Industrial Hygiene	in progress

PhD Dissertations (as committee chair or co-chair)

Gant, Lauren. PhD in Biomedical Engineering, July 2012. Title: *Spectral analysis of root-mean-square processed surface electromyography data as measure of repetitive muscular exertion*. Post-graduate position: Human Factors and Ergonomics Manager, HNI Corporation, Muscatine, IA.

Schall Jr, Mark. PhD in Industrial Engineering, December 2014. Title: *Application of inertial measurement units for directly measuring occupational exposure to non-neutral postures of the low back and shoulder*. Post-graduate position: Assistant Professor (tenure track), Industrial & Systems Engineering, Auburn University, Auburn, AL.

Chen, Howard. PhD in Industrial Engineering, May 2017. Title: *The effects of movement speeds and magnetic disturbance on inertial measurement unit accuracy: the implications of sensor fusion algorithms in occupational ergonomics applications*. Post-graduate position: Post-doctoral fellow, Mechanical Engineering, Auburn University, Auburn, AL.

Ramaswamy, Maya. PhD in Occupational and Environmental Health, May 2018. Title: *Assessing occupational health among transitional agricultural workforces: a mixed methods study among US beginning farmers and South Indian tea harvesting workers*. Post-graduate position: Epidemic Intelligence Service Officer, Centers for Disease Control and Prevention.

Metwali, Mahmoud. PhD in Biomedical Engineering, May 2019. Title: *Motor variability, task performance, and muscle fatigue during training of a repetitive lifting task: adapting motor learning topics to occupational ergonomics research*. Post-graduate position: Human Factors Researcher 1, Adecco (at Google).

Guzowski, Tyler, PhD in Occupational and Environmental Health, May 2025 expected. Title: TBD.

PhD Committees (*denotes student at East Tennessee State University)

Meyers, Alysha	PhD in Occupational and Environmental Health	May 2010
Hall, Kimberlee*	PhD in Environmental Health	August 2012
DeShaw, Jonathan	PhD in Biomedical Engineering	May 2013
Looft, John	PhD in Biomedical Engineering	December 2014
Ramirez, Joel	PhD in Industrial Hygiene	December 2015
Gross, Nathan	PhD in Occupational and Environmental Health	May 2016
Liu, Xiaoxing	PhD in Informatics	August 2016
Holder, Craig	PhD in Industrial Hygiene	May 2017
Crawford, Kate	PhD in Industrial Hygiene	May 2020
Aryal, Ashamsa	PhD in Occupational and Environmental Health	December 2020
Becklinger, Nicole	PhD in Industrial & Systems Engineering	May 2020
Osinuga, Abisola	PhD in Occupational and Environmental Health	August 2021
Maharani, Cynthia	PhD in Occupational and Environmental Health	in progress
Stroh, Oliver	PhD in Industrial & Systems Engineering	in progress

Professional Students

Tiedman, Michael. MPH (Ergonomics), May 2013.

Smithart, Kelsey. MPH (Ergonomics), May 2013.

Madson, Ellie. MPH (Occupational and Environmental Health), May 2025 expected

Other Advising/Mentoring

From 2009 to 2012, Occupational Medicine residents were required to take a rotation in ergonomics. During these years, eight residents each spent approximately 40 contact hours with my research group. In 2013, the rotation was replaced with a requirement for these residents to enroll in Occupational Ergonomics: Principles. The Occupational Medicine residency program was discontinued in 2019.

Local and Regional Continuing Medical Education Talks

Fethke N (2009). Assessing Exposure to Physical Risk Factors. Heartland ERC Annual Occupational Health Symposium. Iowa City, IA.

Fethke N (2009). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2010). Assessing Exposure to Physical Risk Factors. Heartland ERC Annual Occupational Health Symposium. Iowa City, IA.

Fethke N (2010). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2011). Ergonomics: Current Scientific Concepts and Knowledge for the Prevention of Work-Related MSDs. Heartland ERC Annual Occupational Health Symposium. Iowa City, IA.

Fethke N (2011). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2012). Ergonomic Interventions: Evaluate their Effectiveness. Heartland ERC Annual Occupational Health Symposium. Iowa City, IA.

Fethke N (2013). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2014). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2014). Occupational Ergonomics: General Concepts and Recent Epidemiological Research. Heartland ERC Annual Occupational Health Symposium. Cedar Rapids, IA.

Fethke N (2015). Musculoskeletal Health among Office Workers: Occupational Factors and Intervention Strategies. Heartland ERC Annual Occupational Health Symposium. Cedar Rapids, IA.

Fethke N (2015). Patient Handling and Musculoskeletal Health: The Evidence and Intervention Strategies. 22nd National Evidence-Based Practice Conference. Iowa City, IA.

Fethke N (2017). Ergonomics in Agriculture. Great Plains Center for Agricultural Health – the Building Capacity Core Course. Iowa City, IA.

Fethke N (2018). Whole-Body and Hand-Arm Vibration. Heartland ERC Annual Occupational Health Symposium. Cedar Rapids, IA.

Fethke N (2019). Musculoskeletal Disorders and Ergonomics: Case Study. AgriSafe Nurse Scholar Program, online.

Fethke N (2021). Musculoskeletal Disorders and Ergonomics: Case Study. AgriSafe Nurse Scholar Program, online.

Fethke N (2022). Musculoskeletal Disorders and Ergonomics: Case Study. AgriSafe Nurse Scholar Program, online.

Invited Seminars, Webinars, and Presentations

Fethke N (2008). Surface electromyography in ergonomics exposure assessment: implications and applications in construction. Virginia Tech Center for Innovation in Construction Safety and Health, Virginia Tech University, Blacksburg, VA.

Fethke N (2010). Ergonomics in the College of Public Health. College of Public Health External Advisory Board Meeting, University of Iowa, Iowa City, IA.

Fethke N (2011). Ergonomics: applying engineering principles to the science and practice of occupational health. Biomedical Engineering Graduate Seminar, University of Iowa, Iowa City, IA.

Fethke N (2011). Healthier workplaces through ergonomics. Iowa Worklife Forum. University of Iowa, College of Public Health, Department of Occupational and Environmental Health, Iowa City, IA.

Fethke N (2011). Office ergonomics: state of the science. Shive-Hattery, Inc., Iowa City, IA

Fethke N (2012). Ergonomic and welding fume exposures during study welding: a multidisciplinary research effort. Occupational and Environmental Health Seminar, University of Iowa, Iowa City, IA.

Fethke N (2012). Ergonomics: leveraging engineering and public health principles to improve worker health. Industrial Engineering Graduate Seminar, University of Iowa, Iowa City, IA.

Fethke N (2013). Musculoskeletal symptoms among agricultural workers: design and preliminary findings of a Great Plains Center for Agricultural Health research study. Occupational and Environmental Health Seminar, University of Iowa, Iowa City, IA.

Fethke N, Peters T (2013). Engineering a safe, healthy and productive workforce. Biomedical Engineering 1st-year Professional Seminar, University of Iowa, Iowa City, IA.

Fethke N (2014). Occupational ergonomics. Protecting Worker Health and Safety, Labor Center, University of Iowa, Iowa City, IA.

Ramaswamy M, Fethke N (2015). The right tool for the job... and you. Practical Farmers of Iowa Annual Conference, Ames, IA.

Fethke N, Peters T (2015). Engineering a safe, healthy and productive workforce. Biomedical Engineering 2nd-year Professional Seminar, University of Iowa, Iowa City, IA.

Fethke N (2015). Occupational ergonomics. Protecting Worker Health and Safety, Labor Center, University of Iowa, Iowa City, IA.

Fethke N (2015). Total Worker Health™: a new frontier in occupational safety and health research and education. (Keynote address) Safety Conference & Expo: Industry & Construction, Southeastern Community College, West Burlington, IA.

Fethke N (2015). Safety and health implications of sedentary work interventions. NIOSH Total Worker Health™ Webinar Series, July 13, online (460 live webinar attendees). (Fethke was one of four invited speakers).

Fethke N (2015). Musculoskeletal pain among agricultural workers: lessons from an ongoing prospective study. Southwest Center for Occupational and Environmental Health Seminar, University of Texas School of Public Health, Houston/San Antonio, TX.

Fethke N (2016). Sedentary work and your health. Coverys Loss Prevention Services Webinar Series, Oct 19, online (50 live webinar attendees).

Fethke N (2018). Best-practices for measurement and evaluation of occupational exposure to whole-body and hand-arm vibration. Protecting Worker Health and Safety, Labor Center, University of Iowa, Iowa City, IA.

Fethke N (2018). Whole-body vibration during agricultural machine operation. Occupational and Environmental Health Seminar, University of Iowa, Iowa City, IA.

Douphrate D, Fethke N (2019). Large herd dairy milking parlors: exposure characterization and intervention analysis. NIOSH Education and Research Centers Ergonomics Webinar Series, June 19, online.

Fethke N (2019). Musculoskeletal disorders and ergonomics: case study. AgriSafe Nurse Scholar Program (webinar series), September 25, online.

Fethke N (2020). Whole body vibration during agricultural machine operation. Industrial and Systems Engineering Seminar, Auburn University, Auburn, AL.

Douphrate D, Fethke N (2020). Fatigue in the workplace: measurement considerations and effects on health and performance. NIOSH Education and Research Centers Ergonomics Webinar Series, December 16, online.

Fethke N (2021). Ergonomics in agriculture: results from a study of Midwest agricultural workers. Industrial and Systems Engineering Graduate Seminar, University of Iowa, Iowa City, IA.

Peer-Reviewed Publications

Published or In Press

1. Anton D, Shibley LD, Fethke NB, Hess J, Cook TM, Rosecrance J. 2001. The effect of overhead drilling position on shoulder moment and electromyography. *Ergonomics*, 44(5):489-501. (PMID: 11345492)
2. Fethke NB, Anton DC, Cavanaugh JE, Gerr F, Cook TM. 2007. Bootstrap exploration of EMG sampling duration in relation to exposure estimate precision. *Scandinavian Journal of Work, Environment & Health*, 33(5):358-367. (PMID: 17973062)
3. Kraska JM, Ramsey MW, Haff GG, Fethke N, Sands WA, Stone ME, Stone MA. 2009. Relationship between strength characteristics and unweighted and weighted vertical jump height. *International Journal of Sport Physiology and Performance*, 4:461-473. (PMID: 20029097)
4. Fethke NB, Gant LC, Gerr F. 2011. Comparison of biomechanical loading during use of conventional stud welding equipment and an alternate system. *Applied Ergonomics*, 42:725-734. (PMID: 21183155)
5. Gerr F, Fethke N. 2011. Ascertaining computer use in studies of musculoskeletal outcomes among computer users: differences between self-report and computer registration software. *Occupational and Environmental Medicine*, 68:465-466. (PMID: 21508426)
6. Gerr F, Fethke N. 2012. Author's response. *Occupational and Environmental Medicine*, 69:525. (PMID: 22383590)
7. Kitzmann AS, Fethke NB, Baratz KH, Zimmerman MB, Hackbarth DJ, Gehrs KM. 2012. A survey study of musculoskeletal disorders among eye care physicians compared to family medicine physicians. *Ophthalmology*, 119:213-220. (PMID: 21925736)
8. Douphrate DI, Fethke NB, Nonnenmann MW, Rosecrance JC, Reynolds SJ. 2012. Full shift arm inclinometry among dairy parlor workers: a feasibility study in a challenging work environment. *Applied Ergonomics*, 43:604-613. (PMID: 22019358)
9. Fethke NB, Gerr F, Anton DC, Cavanaugh JE, Quickel MT. 2012. Variability in muscle activity and wrist motion measurements among workers performing non-cyclic work. *Journal of Occupational and Environmental Hygiene*, 9:25-35. (PMID: 22150404)
10. Bruflat AK, Balter JE, McGuire D, Fethke NB, Maluf KS. 2012. Stress management as an adjunct to physical therapy for chronic neck pain. *Physical Therapy*, 92:1348-1359. (PMID: 22700538; PMCID: PMC3461134)

11. Fethke NB, Merlino L, Gerr F. 2013 Effect of ergonomics training on agreement between expert and non-expert ratings of the potential for musculoskeletal harm in manufacturing tasks. *Journal of Occupational and Environmental Medicine*, 22 (12 Suppl):S82-S85.(PMID: 24284748; PMCID: PMC7008929)
12. Gerr F, Fethke NB, Merlino L, Anton D, Rosecrance J, Jones MP, Marcus M, Meyers AR. 2014. A prospective study of musculoskeletal outcomes among manufacturing workers: I. Effects of physical risk factors. *Human Factors*, 56:112-130. (PMID: 24669547)
13. Gerr F, Fethke NB, Anton D, Merlino L, Rosecrance J, Marcus M, Jones M. 2014. A prospective study of musculoskeletal outcomes among manufacturing workers: II. Effects of psychosocial stress and work organization factors. *Human Factors*, 56:178-190. (PMID: 24669552).
14. Meyers AR, Gerr F, Fethke NB. 2014. Evaluation of alternate category structures for the Strain Index, an empirical analysis. *Human Factors*, 56:131-142 (PMID: 24669548; PMCID: PMC4557699).
15. Schall Jr MC, Fethke NB, Chen H, Kitzmann A. 2014. A comparison of examination equipment used during common clinical ophthalmologic tasks. *IIEE Transactions on Occupational Ergonomics and Human Factors*, 2:105-117. (doi: 10.1080/21577323.2014.964812)
16. Silver K, Hoffman K, Loury S, Fethke NB, Liebman A, Manz N, Manock S, Andino A, Bradfield M, Morisette D, Florence J. 2014. A campus-community partnership for farmworkers' health: an intervention for tomato workers in Tennessee. *Progress in Community Health Partnerships*, 8:501-510. (PMID: 25727983)
17. Fethke NB, Merlino L, Gerr F, Schall Jr MC, Branch CA. 2015. Musculoskeletal pain among Midwest farmers and associations with agricultural activities. *American Journal of Industrial Medicine*, 58:319-330. (PMID: 25345841)
18. Schall Jr MC, Fethke NB, Chen H, Gerr F. 2015. A comparison of instrumentation methods to estimate thoracolumbar motion in field-based occupational studies. *Applied Ergonomics*, 48:224-231. (PMID: 25683549)
19. Fethke NB, Schall Jr MC, Determan EM, Kitzmann AS. 2015. Neck and shoulder muscle activity among ophthalmologists during routine clinical examinations. *International Journal of Industrial Ergonomics*, 49:53-59. (doi: 10.1016/j.ergon.2015.06.001)
20. Schall Jr MC, Fethke NB, Chen H, Oyama S, Douphrate D. 2016. Accuracy and repeatability of an inertial measurement unit system for field-based occupational studies. *Ergonomics*, 59:591-602. (PMID: 26256753)
21. Carr L, Leonhard C, Tucker S, Fethke N, Benzo R, Gerr F. 2016. Total Worker Health™ intervention targeted to sedentary office workers: a randomized controlled trial. *American Journal of Preventive Medicine*, 50:9-17. (PMID: 26260492)
22. Schall Jr MC, Chen H, Fethke NB. 2016. Evaluation of four sensor locations for physical activity assessment. *Applied Ergonomics*, 53:103-109. (PMID: 26674410)
23. Fethke NB, Peters TM, Leonard SA, Metwali MA, Mudunkotuwa IA. 2016. Reduction of biomechanical and welding fume exposures in stud welding. *Annals of Occupational Hygiene*, 60:387-401 (PMID:26602453; PMCID: PMC4861640)
24. Marker RJ, Balter JE, Nofsinger ML, Anton D, Fethke NB, Maluf KS. 2016. Upper trapezius muscle activity in healthy office workers: reliability and sensitivity of occupational exposure measures to differences in sex and hand dominance. *Ergonomics*, 59:1205-1214. (PMID: 26924036)
25. Schall Jr MC, Fethke NB, Chen H. 2016. Working postures and physical activity among registered nurses. *Applied Ergonomics*, 54:243-250. (PMID: 26851483)
26. Douphrate DI, Fethke NB, Nonnenmann MW, Rodriguez A, Hagevoort R, Gimeno Ruiz de Porras D. 2016. Effect of a novel teat preparation system on upper extremity muscle activity among U.S. large-herd parlor

- workers. *International Journal of Industrial Ergonomics*, 56:161-169. (doi: 10.1016/j.ergon.2016.10.003; PMID: PMC7043381)
27. Douphrate DI, Gimeno Ruiz de Porras D, Nonnenmann MW, Hagevoort R, Reynolds SJ, Rodriguez A, Fethke NB. 2017. Effects of milking unit design on upper extremity muscle activity during attachment among U.S. large-herd parlor workers. *Applied Ergonomics*, 58:482-490. (PMID: 27633245; PMID: PMC7008452)
28. Douphrate DI, Fethke NB, Nonnenmann MW, Rodriguez A, Hagevoort R, Gimeno Ruiz de Porras D. 2017. Full-shift and task-specific assessment of muscle activity among large-herd dairy parlour workers. *Ergonomics*, 60:1042-1054. (PMID: 27854562; PMID: PMC7020102)
29. Granzow RF, Schall Jr MC, Smidt MF, Chen H, Fethke NB, Huangfu R. 2018. Characterizing exposure to physical risk factors among reforestation hand planters in the Southeastern United States. *Applied Ergonomics*, 66:1-8. (PMID: 28958420)
30. Chen H, Schall Jr MC, Fethke N. 2018. Accuracy of angular displacements and velocities from inertial-based inclinometers. *Applied Ergonomics*, 67:151-161. (PMID: 29122186)
31. Fethke NB, Schall Jr MC, Merlino L, Branch C, Ramaswamy M. 2018. Whole-body vibration and trunk posture during operation of agricultural machinery. *Annals of Work Exposures and Health*, 62:1123-1133. (PMID: 30239568; PMID: PMC8328096).
32. Schall Jr MC, Fethke NB, Roemig V. 2018. Digital human modeling in the occupational safety and health process: an application in manufacturing. *IIEE Transactions on Occupational Ergonomics and Human Factors*, 6:64-75. (doi: 10.1080/24725838.2018.1491430; PMID: PMC6455952)
33. Kersten JT, Fethke NB. 2019. Radio frequency identification to measure the duration of machine-paced assembly tasks: agreement with self-reported task duration and application in variance components analyses of upper arm postures and movements recorded over multiple days. *Applied Ergonomics*, 75:74-82. (PMID: 29122186)
34. Huizinga NC, Fethke NB, Davis JA, Gerr F. 2019. Association between occupational injury and subsequent employment termination among newly hired manufacturing workers. *International Journal of Environmental Research and Public Health*, 16, E433 (PMID: 30717333; PMID: PMC6388166)
35. Douphrate DI, Fethke NB, Nonnenmann M, Rodriguez A, Gimeno Ruiz de Porras D. 2019. Reliability of observational- and machine-based teat hygiene scoring methodologies. *Journal of Dairy Science*, 102:7494-7502. (doi: 10.3168/jds.2019-16351; PMID: PMC6939313)
36. Fethke NB, Schall Jr MC, Chen H, Branch CA, Merlino LA. 2020. Biomechanical factors during common agricultural activities: results of on-farm exposure assessments using direct measurement methods. *Journal of Occupational and Environmental Hygiene*, 17:85-96. (PMID: 32069181; PMID: PMC8256625)
37. Chen H, Schall Jr MC, Fethke NB. 2020. Measuring upper arm elevation using an inertial measurement unit: an exploration of sensor fusion algorithms and gyroscope models. *Applied Ergonomics*, 89, 103187. (ePub ahead of print; PMID: 32854821; PMID: PMC9605636)
38. Crawford K, Fethke NB, Peters TM, Anthony TR. 2021. Assessment of occupational personal sound exposures for music instructors. *Journal of Occupational and Environmental Hygiene*, Jan 28, 1-13. (ePub ahead of print; PMID: 33507840; PMID: PMC8091079).
39. Schall MC Jr, Zhang X, Chen H, Gallagher S, Fethke NB. 2021. Comparing upper arm and trunk kinematics between manufacturing workers performing predominantly cyclic and non-cyclic work tasks. *Applied Ergonomics*, 93, 103356. (ePub ahead of print; PMID: 33454432)

40. Osinuga A, Hicks C, Ibitove SE, Schweizer M, Fethke NB, Baker K. 2021. A meta-analysis of the association between the physical demands of domestic labor and back pain among women. *BMC Women's Health*, 21:150. (doi: 10.1186/s12905-021-01294-5; PMCID: PMC8045256)
41. Berman JD, Ramirez M, Bell JE, Bilotta R, Gerr F, Fethke NB. 2021. The association between drought conditions and occupational psychosocial stress among U.S. farmers: an occupational cohort study. *Science of the Total Environment*, 798:149245. (doi: 10.1016/j.scitotenv.2021.149245)
42. Osinuga A, Janssen B, Fethke NB, Story WT, Imaledo JA, Baker KK. 2021. Understanding rural women's domestic work experiences (DWEs) in Ibadan, Nigeria: Development of a measurement tool using confirmatory factor analysis. *International Journal of Environmental Research and Public Health*, 18:11043. (doi: 10.3390/ijerph182111043; PMCID: PMC8582860)
43. Roeder SK, Wilder DG, Fethke NB. 2022. Novel methods to detect impacts within whole-body vibration time series data. *Ergonomics*, 65:1609-1620. (doi: 10.1080/00140139.2022.2041735; PMID: 35148664)
44. Osinuga A, Fethke NB, Story WT, Ibitoye SE, Baker KK. 2022. Assessing the relationship between domestic work experience and musculoskeletal health among rural Nigerian women. *PLoS ONE*, 17(12):e0276380. (doi: 10.1371/journal.pone.0276380; PMCID: PMC9747006)
45. Chen H, Schall MC, Fethke NB. 2023. Gyroscope vector magnitude: a proposed method for measuring angular velocities. *Applied Ergonomics*, 109:103981. (doi:10.1016/j.apergo.2023.103981; PMID: 36739779)
46. Aryal A, Janssen B, Casteel C, Fethke NB, Buikema B, Cho H, Rohlman DS. 2023. Applying the worker well-being framework to identify factors that impact turnover among long-haul truck drivers. *Workplace Health & Safety*, ePub ahead of print. (doi: 10.1177/216507992311786)

Manuscripts In Press

None at this time.

Manuscripts Submitted

1. Chen H, Schall MC Jr, Martin S, Fethke NB. Drift-free joint angle calculation using inertial measurement units without magnetometers: an exploration of sensor fusion methods for the elbow and wrist. *Sensors*. *Submitted*.

Peer-Reviewed Conference Proceedings Papers

1. Anton D, Shibley DL, Fethke NB, Hess J, Cook TM. Effect of step height on overhead drilling in construction. Proceedings of the 44th Annual Meeting of the Human Factors and Ergonomics Society, San Diego, CA, pp5-663 – 5-666, 2000.
2. Fethke N, Anton D, Fuller H, Cook T. A versatile program for the analysis of electromyographic data. Proceedings of the 48th Annual Meeting of the Human Factors and Ergonomics Society, New Orleans, LA, pp2099-2103, 2004.
3. Fethke NB, Anton DC, Cavanaugh JE, Gerr F, Cook TM. The effect of sampling duration on EMG-based estimates of exposure to forceful exertion. Proceedings of the 4th Annual National Occupational Research Agenda (NORA) Young/New Investigators Symposium. University of Utah, Salt Lake City, UT, pp39-50, 2006.
4. Fethke NB, Anton DC, Cavanaugh JE, Gerr F, Cook TM. The effect of EMG sampling duration on forceful exertion exposure estimates. Proceedings of the 16th Triennial Congress of the International Ergonomics Association, Maastricht, The Netherlands, CD-ROM, 2006.
5. Fethke NB, Gerr F, Anton DC, Cavanaugh JE, Cook TM. Cross-sectional study of upper trapezius muscle activity and self-reported neck/shoulder pain. Proceedings of the 51st Annual Meeting of the Human Factors and Ergonomics Society, Baltimore, MD, pp962-966, 2007.

6. Gant L, Fethke N, Gerr F. Spectral analysis of root-mean-square processed surface electromyography data as a measure of repetitive muscular exertion. Proceedings of the 56th Human Factors and Ergonomics Society Annual Meeting, Boston, MA, pp1140-1144, 2012.
7. Schall Jr MC, Chen H, Fethke N. Comparing fatigue, physical activity, and posture among nurses in two staffing models. Proceedings of the 59th Human Factors and Ergonomics Society Annual Meeting, Los Angeles, CA, pp1269-1273, 2015.
8. Chen H, Schall Jr MC, Fethke N. Effects of movement speed and magnetic disturbance on the accuracy of inertial measurement units. Proceedings of the 61st Human Factors and Ergonomics Society Annual Meeting, Austin, TX, pp1046-1050, 2017.
9. Metwali M, Fethke NB. Are worker perceptions of task ease and performance associated with within-subject motor variation during repetitive work? Proceedings of the 62nd Human Factors and Ergonomics Society Annual Meeting, Philadelphia, PA, pp848-852, 2018.
10. Harris-Adamson C, Meyers A, Bonfigliani R, Kapellusch J, Dale AM, Thiese M, Fethke N, Eisen EA, Bao S, Evanoff B, Hegmann K, Gerr F, Violante FS, Rempel D. Differences in the association between the 2018 ACGIH TLV for Hand Activity and carpal tunnel syndrome by gender and age. Proceedings of the 65th Human Factors and Ergonomics Society Annual Meeting, Baltimore, MD, pp708-709.

Conference Papers Submitted

None at this time

Conference Presentations (* denotes presenting author, if other than first author)

1. Meyers A, Fuller H, Fethke N, Herwig K, Anton D. The effect of lift origin height on lumbar kinematics among masons. Sixth International Scientific Conference on the Prevention of Work-related Musculoskeletal Disorders. Boston, MA, August 27-30, 2007.
2. McGehee D, Anton D, Fethke N, Meyers A, Boer E, Manser M, Ward, N. The use of EMG in immersive driving simulation for crash avoidance research: lessons learned. Driving Simulation Conference – North America. Iowa City, Iowa, 2007.
3. Kraska JM, Ramsey MW, Haff GG, Fethke N, Kinser AM, Sands WA, Painter K, Stone ME, Stone MH. Relationship between isometric force characteristics and the difference in un-weighted and weighted vertical jump height. The UK Strength and Conditioning Association 4th Annual Conference. Belfast, Northern Ireland, June 6-8, 2008.
4. Douphrate D, Rosecrance J, Fethke N, Nonnenmann M. Full-shift upper extremity direct exposure assessment of US dairy parlor workers. Seventh International Conference on Prevention of Work-related Musculoskeletal Disorders. Angers, France, August 29-September 3, 2010.
5. Kitzmann A, Fethke N, Baratz K, Zimmermann M, Hackbarth D, Gehrs K. A survey study of musculoskeletal disorders among eye care physicians compared to family medicine physicians. American Academy of Ophthalmology Annual Meeting. Orlando, FL, October 22-25, 2011.
6. Meyers A, Gerr F, Fethke N. Associations between the Strain Index and incident hand-arm symptoms among manufacturing workers. 2011 NORA Manufacturing Sector Conference. Cincinnati, OH, September 7-8, 2011.
7. Manz N, Silver K, Fethke N, Hoffman K, Loury S, Florence J. Building a consensus for tomato worker ergonomics: a community-expert panel study. American Public Health Association 104th Annual Meeting and Exposition. San Francisco, CA. October 27-31, 2012.

8. Fethke N, Gerr F, Merlino L, Branch C, Hanson S. Effect of participatory ergonomics training on non-ergonomist ratings of ergonomics exposures. Total Worker Health Symposium – Safe, Healthy and Cost-Effective Solutions. Iowa City, IA. November 29-30, 2012.
9. Fethke NB, Gerr F, Merlino L, Branch C, Schall Jr MC. A prospective study of musculoskeletal symptoms among agricultural workers. International Society for Agricultural Safety and Health Conference. Sandusky, OH. June 23-27, 2013.
10. Fethke NB, Gerr F, Merlino L, Branch C, Schall Jr MC. Musculoskeletal symptoms among Midwest farmers. 2013 Midwest Rural Agricultural Safety and Health Conference. Ames, IA. November 21-22, 2013.
11. Ramirez J, Altmaier R, Fethke N, O’Shaughnessy P. Innovative breathing simulation developed to measure filtering face-piece respirator performance. 2013 AIHA Conference and Exposition. Montreal, Canada. May 18-23, 2013. (student poster)
12. Simpson J, Browne L, Coleman B, Fethke N, Anton D. Comparison of acceleration during thoracic spinal manipulation between students and physical therapists experience in delivering high velocity low amplitude thrust. Combined Sections Meeting of the American Physical Therapy Association. Las Vegas, NV. February 3-6, 2014. (student poster)
13. Fethke NB, Gerr F, Merlino L, Branch C, Schall Jr MC*. Exposure to physical risk factors for musculoskeletal health outcomes during common agricultural activities. International Society of Agricultural Safety and Health Conference. Omaha, NE. June 22-26, 2014.
14. Branch C, Fethke N, Merlino L. A worksite wellness coaching component of a Total Worker Health intervention in a manufacturing setting. 1st International Symposium to Advance TOTAL WORKER HEALTH. Bethesda, MD, October 2-8, 2014.
15. Schall Jr MC, Fethke N. Digital human modeling of non-occupational risk factors for manufacturing work task design. 1st International Symposium to Advance TOTAL WORKER HEALTH. Bethesda, MD, October 2-8, 2014.
16. Schall Jr MC, Chen H, Merlino L, Gerr F, Fethke N. A prospective study of musculoskeletal symptoms among agricultural workers in the Midwest region of the United States. 7th International Symposium: Safety & Health in Agricultural & Rural Populations: Global Perspectives. Saskatoon, SK, Canada. October 19-22, 2014.
17. Douphrate D, Fethke N, Hagevoort R, Nonnenmann M, Gimeno D, Mixco A, Marshall A, Reynolds S. Task-specific and full-shift sampling of upper extremity muscle activity among US large-herd dairy parlor workers. 7th International Symposium: Safety & Health in Agricultural & Rural Populations: Global Perspectives. Saskatoon, SK, Canada. October 19-22, 2014.
18. Chen H, Schall Jr MC, Fethke N, Oyama S, Douphrate D. Accuracy of inertial measurement units for wrist posture measurement. 13th Annual National Occupational Research Agenda (NORA) Young/New Investigators Symposium. University of Utah, Salt Lake City, UT. April 16-17, 2015.
19. Schall Jr MC, Fethke N. Characterizing the muscle activity of ophthalmologists performing routine patient examinations. 13th Annual National Occupational Research Agenda (NORA) Young/New Investigators Symposium. University of Utah, Salt Lake City, UT. April 16-17, 2015.
20. Fethke N. Associations between exposure to physical risk factors and musculoskeletal pain among agricultural workers. Occupational Hygiene in Agriculture – Roundtable Session. 2015 AIHce. Salt Lake City, UT. May 30 – June 4.
21. Schall Jr MC, Fethke NB, Ramaswamy M, Chen H, Branch C, Merlino L, Watabe J, Gerr F. Whole-body vibration among agricultural workers performing common agricultural activities. International Society of Agricultural Safety and Health Annual Conference. Bloomington-Normal, IL. June 21-24, 2015.

22. Chen H, Merlino L, Branch C, Schall Jr MC, Gerr F, Fethke NB. Seasonal effects of common farm tasks on the experience of low back pain. International Society of Agricultural Safety and Health Annual Conference. Bloomington-Normal, IL. June 21-24, 2015.
23. Anderson D, Houser R, Simpson J, Browne L, Coleman B, Fethke N, Anton D. Comparison of acceleration during thoracic spinal manipulation between students and physical therapists experienced in delivering high velocity low amplitude thrust (poster). 4th Annual Celebration Conference. 2015 (9/22). Cheney, WA.
24. Branch CA, Fethke NB, Merlino L, Smith K. A worksite wellness coaching component of a Total Worker Health® intervention in a manufacturing setting: coaching summary and select effects on stress. Work, Stress, and Health Conference. Minneapolis, MN, June 7-10, 2017.
25. Huizinga N, Fethke N*. Occupational injury and employment duration: an analysis of newly hired manufacturing workers. Total Worker Health® 2nd International Symposium. Bethesda, MD, May 8-11, 2018.
26. Fethke N, Merlino L, Branch C. Comparing employee goals set during health coaching to health risk appraisal responses. Total Worker Health® 2nd International Symposium. Bethesda, MD, May 8-11, 2018.
27. Chen H, Schall Jr MC, Fethke NB. Identification of magnetically disturbed inertial measurement unit data segments. 20th Congress of the International Ergonomics Association. Florence, Italy, August 26-30, 2018.
28. Shull JR, Kim H, Roshdibenam V, Fethke N, Baek S. Ergonomic assessment via deep convolutional neural networks. 2020 Institute of Industrial and Systems Engineers (IISE) Annual Conference. May 30 – June 2, 2020, New Orleans, LA. (*conference delayed and held in virtual format Nov 1-3, 2020*)
29. Harris Adamson C, Rempel D, Eisen E, Meyers R, Bao S, Gerr F, Fethke N, Evanoff B, Dale AM, Hegmann K, These M, Kapellusch J, Bonfiglioli R, Violante F. Comparison of the 2001 and 2018 ACGIH TLV® for Hand Activity and risk of carpal tunnel syndrome across pooled multi-national prospective studies. International Ergonomics Association 21st Triennial Congress. Vancouver, Canada, June 13-18, 2021.
30. Berman JD, Ramirez MR, Bell JE, Bilotta R, Gerr F, Fethke NB. The association between drought conditions and occupational psychosocial stress among Midwestern US farmers: an occupational cohort study. International Society for Environmental Epidemiology Annual Meeting. New York City, New York, August 13-16, 2021.

Conference Abstracts Submitted

None at this time

Other Conference Presentations/Posters (without accompanying proceedings paper or abstract)

1. Anton D, Cook T, Rosecrance J, Deter S, Fethke N. Tool Design for the 21st Century. 12th Annual Construction Safety & Health Conference. Chicago, IL, June 6-8, 2002
2. Cook T, Anton D, Fethke N. Ergonomics in Construction (short course). 14th Annual Construction Safety & Health Conference. Chicago, IL, February 12-14, 2004.
3. Fethke N, Anton D. A comparison of methods for directly measuring awkward postures of the wrist. NIOSH Pilot Project Research Symposium. Iowa City, IA – Chicago, IL via Polycom, April 21, 2004.
4. Fethke N, Anton D, Gerr F, Rosecrance J, Merlino L. Exposure assessment in a longitudinal study of work-related musculoskeletal disorders: emphasis on EMG data collection and analysis. Lucien Brouha Work Physiology Symposium, Keystone, CO, June 22-24, 2004.
5. Fethke N, Anton D. How much is enough? The impact of sampling duration on the accuracy and precision of exposure estimates. Lucien Brouha Work Physiology Symposium, Waterloo, IA, Sept 5-7, 2005.
6. Fethke N, Anton D. The effect of EMG sampling duration on the precision of forceful exertion exposure estimates. Bringing Research to Practice: A Colloquium of NIOSH Pilot Projects, Iowa City, IA, May 6, 2006.

7. Fethke N. EMG acquisition and processing for exposure assessment in occupational studies. 1st ERC Interdisciplinary Forum on Measurement Systems in Occupational Health and Safety, Iowa City, IA, March 6-7, 2009.
8. Fethke N. Variability of exposure to physical risk factors in non-cyclic work. H. Kenneth Dillon – Brian J. Carnahan Research Day. Deep South Center for Occupational Health and Safety, Tuscaloosa, AL, March 5, 2010.
9. Fethke N. Data acquisition, analysis and signal conditioning. 2nd ERC Interdisciplinary Forum on Measurement Systems in Occupational Health and Safety, Fort Collins, CO, April 29-May 1, 2010.
10. Gant L, Fethke N. Spectral analysis of RMS-processed EMG. 2nd ERC Interdisciplinary Forum on Measurement Systems in Occupational Health and Safety, Fort Collins, CO, April 29-May 1, 2010.
11. Dartt A, Rosecrance J, Douphrate D, Fethke N. Ergonomic exposure assessment: reliability, exposure variability, and sampling strategy. 2nd ERC Interdisciplinary Forum on Measurement Systems in Occupational Health and Safety, Fort Collins, CO, April 29-May 1, 2010.
12. Fethke N. Surface electromyography: quality, processing, and exposure estimation. 3rd ERC Interdisciplinary Forum on Measurement Systems in Occupational Health and Safety, Fort Collins, CO, June 6-8, 2012.
13. Shull J, Fethke NB, Baek S. Posture estimation using computer vision algorithms. 2020 NIOSH ERC Exposure Assessment Symposium. Auburn, AL, February 27-28, 2020.
14. Fethke N, Peters T, Thomas G, Roeder S, Tatum M, Brown N, Ellis D. Multi-hazard exposure assessment and automatic task detection. 2020 NIOSH ERC Exposure Assessment Symposium. Auburn, AL, February 27-28, 2020.

Patents

1. Marquart EJ, Johnson PR, Konkler AW, Fethke NB. (2004). Two-hand tool grip. Patent Number: D488,046. Industry, United States of America. (assignee: Fiskars Brands, Inc.)
2. Marquart EJ, Johnson PR, Konkler AW, Fethke NB. (2004). Handle for a hand tool. Patent Number: D487,010. Industry, United States of America. (assignee: Fiskars Brands, Inc.)
3. Marquart EJ, Johnson PR, Konkler AW, Fethke NB. (2004). Hand tool. Patent Number: 7,350,839. Industry, United States of America. (assignee: Fiskars Brands, Inc.)
4. Baek S, Fethke NB, Robillard J, Buckwalter JA, Villacorta P. (2022). System and method to predict, prevent, and mitigate workplace injuries. Patent Number: US 11328239 B2. (assignee: University of Iowa Research Foundation)

Active Research and Training Grants and Contracts

<i>Grant Information: Title, agency, role, % effort</i>	<i>Funding Period Direct Funds</i>
Using computer vision and deep learning to measure worker kinematics CDC/NIOSH, 1R21OH011911-01A1 Role: PI, 21%	09/30/21 - 09/29/23 \$390k (total, all years)
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (O'Shaughnessy) Role: Ergonomics Training Program Director, 14% Role: Occupational Injury Prevention Program faculty, 8%	07/01/19 - 06/30/24 \$1.4-1.6M/year

Great Plains Center for Agricultural Health CDC/NIOSH U54OH007548 (Anthony) Role: Center Deputy Director, 8% Role: PI, Pilot/Feasibility Projects Program, 5% (\$100k/yr) Role: PI: Research Project 1, 15% (whole-body vibration, \$195k/yr)	09/30/22 – 09/29/27 \$1.14M/year
High Plains Intermountain Center for Agricultural Health and Safety CDC/NIOSH U54OH008085 (Reynolds) Role: Co-investigator of research project, 5% (dairy worker fatigue; Douphrate, PI)	09/30/22 – 09/29/27 \$25k/year (UI sub only)

Completed Research and Training Grants

Grant Information: Title, agency, role	Funding Period Direct Funds
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (Sprince) Pilot project: A comparison of methods for directly assessing awkward postures of the wrist Role: Co-Investigator (pilot project PI: Anton)	01/01/03 – 06/30/03 \$15,000
Effect of a drill bit extender on physical risk factors during overhead sheet metal drilling tasks CDC/NIOSH, via contract (Anton) Role: Co-Investigator	04/07/03 – 03/31/04 \$17,182
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (Sprince) Pilot project: The electromyographic sampling duration required to precisely estimate individual exposure to forceful exertions Role: pilot project PI	07/01/05 – 06/30/06 \$13,192
Deep South Center for Occupational Health and Safety CDC/NIOSH, T42OH008436 (Ostendstad) Pilot project: Exposure variability among workers performing non-cyclic work Role: pilot project PI	04/01/08 - 06/30/09 \$20,000
National Center for Construction Safety & Health Research CDC/NIOSH, U60OH009762 (Stafford) Pilot project: Evaluation of an intervention to reduce trunk flexion among stud welders Role: pilot project PI	04/01/08 – 06/30/10 \$26,050
Heartland Center for Occupational Health and Safety CDC/NIOSH T42OH009491 Role: Ergonomics Training Program Faculty (01/02/2009-6/30/2012, 4%) Role: Ergonomics Training Program Director (07/01/2012-06/30/2014, 10%)	07/01/08 – 06/30/14 \$1.1-1.6M/year
High Plains Intermountain Center for Agricultural Health and Safety CDC/NIOSH, U54OH008085 (Reynolds) Pilot project: Direct measurement of physical risk factors of awkward postures & repetition involving large herd dairy parlor workers Role: Consultant (pilot project PI: Douphrate)	05/01/09 – 04/30/10 \$11,873
Healthier Workforce Center for Excellence CDC/NIOSH, U19OH008868 (Merchant) Pilot project: Effect of participatory ergonomics training on non-ergonomist ratings of ergonomic exposures Role: pilot project PI, 23%	03/15/10 – 8/31/11 \$50,000

Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (O'Shaughnessy) Pilot project: Spectral analysis of root-mean-square processed EMG data as a measure of repetitive muscular exertion Role: Faculty advisor (pilot project PI: Gant)	07/01/11 – 06/30/12 \$15,000
Healthier Workforce Center for Excellence CDC/NIOSH U19OH008868 (Merchant, Rohlman) Role: Center Deputy Director, 5% Role: PI, Pilot/Feasibility Projects Program (\$50k/year) Role: PI, Translational Research Project #4 (\$227k/year, 17%; ended 03/31/2017))	\$600-700k/year 09/01/11-08/31/2016
National Center for Construction Safety & Health Research CDC/NIOSH, U60OH009762 (Stafford) Subproject: Ergonomic and fume exposures during stud welding Role: subproject PI, 13%	09/01/11 - 08/31/14 \$150k/year (sub only)
High Plains Intermountain Center for Agricultural Health & Safety CDC/NIOSH, U54OH008085 (Reynolds) Subproject: Exposure assessment and intervention analysis in industrialized dairy parlors Role: Consultant (subproject PI: Douphrate)	09/30/11 - 09/29/16 \$126k/year (sub only)
Great Plains Center for Agricultural Health CDC/NIOSH U54OH007548 (Gerr, Anthony) Role: PI, Musc. symptoms among agricultural workers (\$165k/year; 20%, ended 03/31/2017)	09/30/11-09/29/16 \$1.3M/year
Southeast Center for Agricultural Health and Injury Prevention CDC/NIOSH, U54OH007547 (Sanderson) Pilot project: Tomato worker ergonomics: REBA panel evaluation of video Role: Consultant (pilot project PI: Silver)	01/01/12 – 12/31/12 \$14,828
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (O'Shaughnessy) Pilot project: Assessment of a novel device for directly measuring trunk posture Role: Faculty advisor (pilot project PI: Schall Jr)	07/01/12 – 06/30/13 \$5,000
Muscle activity and posture during clinical ophthalmologic practice Haag-Streit USA, unrestricted research contract Role: Co-investigator (PI: Kitzmann)	11/01/12 – 10/31/13 \$15,046
Healthier Workforce Center for Excellence CDC/NIOSH, U19OH008868 (Merchant) Pilot project: Efficacy of a combined ergonomic health promotion intervention on employee health Role: Co-investigator (pilot project PI: Carr)	07/01/13 – 06/30/14 \$30,000
Healthier Workforce Center for Excellence CDC/NIOSH, U19OH008868 (Rohlman) Pilot project: Inertial measurement units as a tool for simultaneous worker health protection and promotion Role: Faculty advisor (pilot project PI: Schall Jr)	06/01/14 – 05/31/15 \$29,108
Heartland Center for Occupational Health and Safety CDC/NIOSH T42OH009491 Role: Ergonomics Training Program Director (07/01/2012-06/30/2014, 14%)	\$1.6-1.7M/year 07/01/14-06/30/19
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (O'Shaughnessy) Pilot project: Characterizing operable conditions for inertial measurement units Role: Faculty advisor (pilot project PI: Chen)	07/01/15 – 06/30/16 \$15,000

Great Plains Center for Agricultural Health CDC/NIOSH, U54OH007548 (Gerr/Anthony) Pilot project: Identifying job demands and health outcomes among Iowa beginning farmers Role: Faculty advisor (pilot project PI: Ramaswamy)	09/30/15 – 09/29/16 \$19,998
Healthier Workforce Center of the Midwest CDC/NIOSH U19OH008868 Role: Associate Center Director (10%) Role: PI, Pilot/Feasibility Projects Program (\$50k/year)	09/01/16 – 08/31/21 \$600-900k/year
Southwest Center for Agricultural Health, Injury Prevention & Education CDC/NIOSH, U54OH007541 (Cassanova) Subproject: Physical exposures and MSS among logging machine operators Role on subproject: Consultant (subproject PI: Douphrate)	09/15/16 - 09/14/22 \$92,721/yr (sub only)
Great Plains Center for Agricultural Health CDC/NIOSH U54OH007548 (Anthony) Role: Center Deputy Director (3%, 03/01/2020-09/29/2022) Role: PI, Pilot/Feasibility Projects Program (\$100k/year, 14%, 03/01/2020-09/29/2022)	09/30/16 – 09/29/22 \$950k-1.1M/year
Heartland Center for Occupational Health and Safety CDC/NIOSH, T42OH008491 (O'Shaughnessy) Pilot project: Temporal relationships of trunk posture variation, task performance, and localized muscle fatigue during training of a simulated cyclic lifting task Role: Faculty advisor (pilot project PI: Metwali)	07/01/17 – 06/30/18 \$19,224
Integration of particulate matter sensor into a system to increase the frequency of personal hearing protective equipment use Air Force Research Laboratory Prime contract #FA8650-18-C-6935 (UES, Inc.) Subcontract PI: Peters Role: Co-investigator (8%)	11/26/18 – 11/25/19 \$133,000
Quasi-semi-active seats (QSAS) for heavy machinery, Phase I NSF Phase I SBIR (Actibiomotion) Subcontract PI: Rahmatalla Role: Co-investigator (4%)	06/15/18 – 02/29/20 \$225,000 (total)
Great Plains Center for Agricultural Health CDC/NIOSH, U54OH007548 (Anthony) Pilot project: The impact of drought conditions on occupational psychosocial stress... Role: Co-investigator (pilot project PI: Berman [U MN])	09/30/19 – 03/31/21 \$30,000
Healthier Workforce Center of the Midwest CDC/NIOSH, U19OH008868 (Rohlman) Role: Center Deputy Director (ended effective 03/01/2023) Role: PI, Pilot/Feasibility Projects Program (ended effective 03/01/2023)	09/01/21 - 08/31/26 \$700-800k/year

Pending Research and Training Grants

<i>Grant Information: Title, agency, role (% effort)</i>	<i>Funding Period Funding Request</i>
Effect of teat cleaning methods on physical demands and musculoskeletal symptoms among dairy parlor workers CDC/NIOSH, Occupational Safety and Health Research (R01) Role: MPI with David Douphrate of UTHSC and PI of subcontract to U of Iowa, 25% Status: Impact score = 25 (11 th percentile; funding decision pending)	07/01/23 – 06/30/27 \$1.8M (total, all years)

Service Activities

Review Panels (external to the University of Iowa)

<u>Dates of Service</u>	<u>Role</u>
2010	Reviewer for “Construction Solutions,” an online database of health and safety interventions for the construction industry published by the NIOSH-funded Center for Construction Research and Training
2012 – 2014	Reviewer, submissions to the Human Factors and Ergonomics Society annual meetings (Occupational Ergonomics Technical Group)
2012	Reviewer (ad hoc), grant proposal to the Saskatchewan Research Foundation
2013	Reviewer (ad hoc), High Plains Intermountain Center for Agricultural Health and Safety (NIOSH Ag Center at Colorado State University)
2014	Reviewer (ad hoc), High Plains Intermountain Center for Agricultural Health and Safety (NIOSH Ag Center at Colorado State University)
2014	Reviewer, submissions to the 7 th International Symposium: Safety & Health in Agricultural & Rural Populations: Global Perspectives
2015	Reviewer (ad hoc), Research and Artistry Awards at Northern Illinois University
2015 – present	Reviewer (ad hoc), Southwest Center for Occupational and Environmental Health (NIOSH ERC at the University of Texas)
2015	Reviewer (ad hoc), Deep South Center for Occupational Health and Safety (NIOSH ERC at the University of Alabama-Birmingham)
2016 – 2019	Reviewer (ad hoc), Safety and Occupational Health Study Section, NIOSH
2017 – 2019	Ely Award Review Panelist, Human Factors and Ergonomics Society
2018	Reviewer (ad hoc), grant proposal to the Workers Compensation Board of Manitoba: Research and Innovation Program
2018	Reviewer (ad hoc), NIOSH internal NORA research proposal
2019 – 2021	Editorial Board Member, IISE Transactions on Occupational Ergonomics and Human Factors
2019 – 2023	Standing Member, Safety and Occupational Health Study Section, NIOSH
2021 – present	Associate Editor, IISE Transactions on Occupational Ergonomics and Human Factors

Departmental, Collegiate or University Service Appointments

<u>Dates of Service</u>	<u>Position</u>
2010 – 2013	Faculty Council, College of Public Health
2013 – 2015	Faculty Senate, University of Iowa
2015 – 2018	Graduate Council, University of Iowa
2015 – present	Integrated Health Management Advisory Group, University of Iowa
2017 – 2020	Research Council, College of Public Health
2019 – present	Undergraduate Curriculum Committee, College of Public Health
2020	UI Future of Work Initiative; Faculty subcommittee

Departmental, Collegiate or University Committees (other than teaching)

<u>Dates of Service</u>	<u>Role</u>
2007 – 2008	ETSU College of Public Health Education Committee
2008	Oral Presentation Judge, Appalachian Student Research Forum (ETSU)
2009 – present	Reviewer, Heartland Center for Occupational Health and Safety Pilot Project Proposals
2009	Member, search committee for Assistant/Associate/Full Professor (Ergonomics focus), Department of Occupational and Environmental Health, University of Iowa
2010	Strategic Planning, subcommittee for infrastructure, Department of Occupational and Environmental Health, University of Iowa
2010 – present	Reviewer, Great Plains Center for Agricultural Health (GCPAH) Pilot/Feasibility Project Proposals
2010 – 2011	Chair, search committee for Assistant/Associate/Full Professor (ergonomics focus), Department of Occupational and Environmental Health, University of Iowa
2012	Strategic Planning, subcommittee for alumni relations, Department of Occupational and Environmental Health, University of Iowa
2012	Member, search committee for Assistant/Associate/Full Professor (ergonomics focus), Department of Occupational and Environmental Health, University of Iowa
2012 – 2016	Director and reviewer, Healthier Workforce Center for Excellence Pilot Project Program
2016 – 2023	Director and reviewer, Healthier Workforce Center of the Midwest Pilot Project Program
2015	Member, Internal Review Group for faculty tenure
2016	Member, Internal Review Group for faculty reappointment
2017	Member, Internal Review Group for faculty promotion and tenure
2020	Member, search committee for Research Assistant Professor, Department of Occupational and Environmental Health
2020 – present	Member, College of Public Health Awards Committee
2021	Member, Internal Review Group for faculty promotion and tenure

State or National Committees

<u>Dates of Service</u>	<u>Role</u>
2007 – present	Human Factors and Ergonomics Society, Occupational Ergonomics Technical Group
2021 – present	Member of ANSI S2/WG39 – Human Exposure to Mechanical Vibration and Shock

International Committees

<u>Dates of Service</u>	<u>Role</u>
2019 – present	Member of US delegation to the ISO Technical Committee 108 / Subcommittee 4 / Working Groups 3 (hand-transmitted vibration), 13 (whole-body vibration), and 14 (posture with reference to whole-body vibration)

Advisory Committees

<u>Dates of Service</u>	<u>Role</u>
2022 – present	External Advisor, Central States Center for Agricultural Safety and Health

2023 – present External Advisor, Healthier Workforce Center of the Midwest

Referee Manuscripts

Frequent	Applied Ergonomics Ergonomics IISE Transactions on Occupational Ergonomics and Human Factors
Occasional	American Journal of Industrial Medicine Annals of Work Exposures and Health (formerly Annals of Occupational Hygiene) Human Factors International Journal of Human Factors and Ergonomics International Journal of Industrial Ergonomics Journal of Occupational and Environmental Hygiene Journal of Occupational and Environmental Medicine Journal of Rural Health Journal of Agricultural Safety and Health Journal of Agromedicine IMA Journal of Management Mathematics BMC Public Health