

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
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NAME Bryan O. Buchholz, Ph.D.		POSITION TITLE Professor – Work Environment Director – Biomedical Engineering and Biotechnology	
eRA COMMONS USER NAME			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
The University of Michigan	B.S.E.	1979	Chemical Engineering
The University of Michigan	M.S.	1983	Bioengineering
The University of Michigan	M.S.E.	1983	Applied Mechanics
The University of Michigan	Ph.D.	1989	Bioengineering

A. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

- 1980 - 1985 Research Assistant: Center for Ergonomics, The University of Michigan, Ann Arbor, Michigan.
1984 Teaching Assistant: Industrial and Operations Engineering Department, The University of Michigan, Ann Arbor, Michigan.
1986 - 1989 NASA Fellow: NASA Center of Excellence in Man-Systems Research, The University of Michigan, Ann Arbor, Michigan.
1989 NIOSH Trainee: NIOSH Center for Occupational Health and Safety Engineering, The University of Michigan, Ann Arbor, Michigan.
1989 - 1990 NIOSH Post-Doctoral Fellow: NIOSH Center for Occupational Health and Safety Engineering, The University of Michigan, Ann Arbor, Michigan.
1990 Research Associate: Center for Ergonomics, The University of Michigan, Ann Arbor, Michigan.
1990 - 1996 Assistant Professor: Department of Work Environment, University of Massachusetts Lowell, Lowell, Massachusetts.
1996 - 2003 Associate Professor: Department of Work Environment, University of Massachusetts Lowell, Lowell, Massachusetts.
2002 - Director: Biomedical Engineering and Biotechnology Program, University of Massachusetts, Lowell, Massachusetts.
2003 - Professor: Department of Work Environment, University of Massachusetts Lowell, Lowell, Massachusetts.

PROFESSIONAL SOCIETIES

- 1987 - American Society of Biomechanics
1989 - International Society of Biomechanics
1993 - Human Factors and Ergonomics Society
1995 - American Industrial Hygiene Association
1997 - International Society of Occupational Ergonomics and Safety
1999- The Ergonomics Society

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.

- Buchholz, B.** and Armstrong, T.J. (1992) A kinematic model of the human hand to evaluate its prehensile capabilities. *Journal of Biomechanics* **25**(2): 149-162.
Buchholz, B., Armstrong, T.J. and Goldstein, S.A. (1992) Anthropometric data for describing the kinematics of the human hand. *Ergonomics* **35**(3): 261-273.

- Perez-Balke, G.M. and **Buchholz, B.** (1994) Role of wrist immobilization in the work environment: Ergonomics and carpal tunnel syndrome. *Work* **4**(3):187-194.
- Buchholz, B.**, Paquet, V., Punnett, L., Lee, D. and Moir, S.M. (1996) PATH: A work sampling-based approach to ergonomic job analysis for construction and other non-repetitive work. *Applied Ergonomics* **26**(3):177-187.
- Moir, S. and **Buchholz, B.** (1996) Emerging participatory approaches to ergonomic interventions in the construction industry. *American Journal of Industrial Medicine* **29**(4):425-430.
- Buchholz, B.** (1997) Electromyographic assessment of prehensile hand function and muscle control. In *Advances in Occupational Ergonomics and Safety 1997*, edited by B. Das and W. Karwowski, Ch. 12, pp.347-350, IOS Press, Amsterdam.
- Buchholz, B.** and Wellman, H. (1997) Practical operation of a biaxial goniometer at the wrist joint. *Human Factors* **39**(1): 119-129.
- Buchholz, B.** (1998) An EMG-driven biomechanical model of the hand. In *Advances in Occupational Ergonomics and Safety 2*, edited by S. Kumar, pp.443-446, IOS Press, Amsterdam.
- Buchholz, B.** and Paquet V. (1998) Reducing ergonomic hazards during highway construction: A case study of a tunnel ceiling panel assembly operation. In *Ergonomics in Health Care and Rehabilitation*, edited by V. Rice, Ch. 11, pp. 187-203, Butterworth-Heinemann, Boston.
- Paquet, V., Punnett, L. and **Buchholz, B.** (1999) An evaluation of manual materials handling in highway construction work. *International Journal of Industrial Ergonomics* **24**(4): 431-444.
- Buchholz, B.**, Moir, S. and Garrett, J. (1999) Health Trak: A participatory approach for ergonomic improvement in construction. In *Implementation of Safety and Health on Construction Sites*, edited by A. Singh, J. Hinze and R.J. Coble, pp. 711-716, Balkema, Rotterdam.
- Kittusamy, N.K. and **Buchholz, B.** (2001) An ergonomic evaluation of excavating operations: A pilot study. *Applied Occupational and Environmental Hygiene* **16**(7): 723-726.
- Paquet, V., Punnett, L. and **Buchholz, B.** (2001) Validity of fixed-interval observations for postural assessment in construction work. *Applied Ergonomics* **32**(3): 215-224.
- Fulmer, S. and **Buchholz, B.** (2002) Ergonomic exposure case studies in Massachusetts fishing vessels. *American Journal of Industrial Medicine Supplement 2*: 10-18.
- Buchholz, B.**, Paquet, V., Wellman, H. and Forde, M. (2003) Quantification of ergonomic hazards for iron workers performing concrete reinforcement tasks during heavy highway construction. *American Industrial Hygiene Association Journal* **64**(2): 243-250.
- Moir, S., Paquet, V., Punnett, L., **Buchholz, B.** and Wegman, D. (2003) Making sense of highway construction: A taxonomic framework for ergonomic exposure assessment and intervention research. *Applied Occupational and Environmental Hygiene* **18**(4):256-267.
- Forde, M.S. and **Buchholz, B.** (2004) Task content and physical risk factors in construction ironwork. *International Journal of Industrial Ergonomics* **34**(4): 319-333.
- Gold, J.E, Cherniak, M. and **Buchholz, B.** (2004) Examination of cutaneous circulation patterns in the distal upper extremity of office workers via infrared thermography. *European Journal of Applied Physiology* **93**:245-251.
- Kalil, A.J., Woskie, S., Holcroft, C., Ellenbecker, M. and **Buchholz, B.** (2004) Time variant exposure analysis (TVEA): A measurement tool for characterizing particulate exposure determinants in construction. *Journal of Occupational and Environmental Hygiene* **1**: 816-825.
- Paquet, V., Punnett, L., Woskie, S. and **Buchholz, B.** (2005) Reliable exposure assessment strategies for physical ergonomic stressors in construction and other non-routinized work. *Ergonomics* **48**(9): 1200-1219.
- Wu, G., van der Helm, F.C.T., Veeger, H.E.J., Makhsous, M., van Roy, P., Anglin, C., Nagels, J., Karduna, R.K., McQuade, K., Wang, X., Werner, F.W. and **Buchholz, B.** (2005) ISB Recommendation on Definitions of Joint Coordinate Systems of Various Joints for the Reporting of Human Joint Motion - Part II: Shoulder, Elbow, Wrist and Hand. *Journal of Biomechanics* **38**: 981-992.
- Tak, S., Punnett, L, Paquet, V., Woskie, S. and **Buchholz B.** (2007) Estimation of compressive forces on lumbar spine from categorical posture data. *Ergonomics* **50**(12): 2082-2094.
- Buchholz, B.**, Park, J.-S., Gold, J.E. and Punnett, L. (2008) Subjective ratings of upper extremity exposures: Inter-method agreement with direct measurement of exposures. *Ergonomics* **51**(7): 1064-1077.
- Tak, S.W., Paquet, V., Woskie, S.R., **Buchholz, B.** and Punnett, L. (2009) Variability in risk factors for knee injury in construction. Accepted for publication in *Journal of Occupational and Environmental Hygiene*

C. Research Support. List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and responsibilities of principal investigator identified above.

CURRENT SUPPORT

Project Number (Principal Investigator)	<u>R01 OH008254 (Bryan Buchholz)</u>
Role	<u>Principal Investigator</u>
Source	<u>NIOSH</u>
Title of Project (or Subproject)	<u>Knee Disorders and Occupational Biomechanical Risks</u>
Dates of Project (Entire Period of Support)	<u>September 1, 2006 – August 31, 2009</u>
The major goals of this project are	<u>To characterize the exposure of carpenters in specific job categories to knee stressors, using observational exposure assessment and focus group/key informant methods.</u>

COMPLETED

Project Number (Principal Investigator)	<u>T42 OH008416-02 (Bryan Buchholz/Brad Schugardt)</u>
Role	<u>Principal Investigator</u>
Source	<u>NIOSH through Harvard ERC</u>
Title of Project (or Subproject)	<u>Biomechanical Evaluation of Air Stretcher as Alternative for Carpet Knee-Kicker</u>
Dates of Project (Entire Period of Support)	<u>July 1, 2007 - June 30, 2008</u>
The major goals of this project are	<u>To assess the biomechanical exposures during carpet stretching and to evaluate an air stretcher as an alternative.</u>

Project Number (Principal Investigator)	<u>T42 OH008416-01 (Jungkeun Park/Bryan Buchholz)</u>
Role	<u>Co-Investigator</u>
Source	<u>NIOSH through Harvard ERC</u>
Title of Project (or Subproject)	<u>An Evaluation of Muscle Activity and Posture of Upper Extremity during Simulated Pipette Work</u>
Dates of Project (Entire Period of Support)	<u>July 1, 2005 - June 30, 2006</u>
The major goals of this project are	<u>To better understand the risks for musculoskeletal disorders during pipette work in hospital laboratories.</u>

Project Number (Principal Investigator)	<u>T42 OH008416-01 (Lu Yuan/Bryan Buchholz)</u>
Role	<u>Co-Investigator</u>
Source	<u>NIOSH through Harvard ERC</u>
Title of Project (or Subproject)	<u>Biomechanical Analysis of the Low Back and Shoulder during Drywall Installation</u>
Dates of Project (Entire Period of Support)	<u>July 1, 2005 - June 30, 2006</u>
The major goals of this project are	<u>To develop biomechanical models of the low back and shoulder during drywall installation and to develop interventions to reduce risks for musculoskeletal disorders in this construction trade.</u>