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EDUCATION

University of Michigan	PhD	1990	Applied Mechanics
University of Michigan	MS	1981	Mechanical Engineering
University of Michigan	BS	1980	Mechanical Engineering

PROFESSIONAL EMPLOYMENT/POSITIONS

2006 – <u>present</u>	Director, Biomechanics Research Laboratory, Allegheny General Hospital, Pittsburgh, Pa
2006 – <u>present</u>	Associate Research Professor, University of Pittsburgh, Department of Mechanical Engineering and Materials Science & Department of Bioengineering, Pittsburgh, Pa
2006 – <u>present</u>	Associate Professor of Orthopaedic Surgery, College of Medicine, Drexel University, Allegheny General Hospital Campus, Pittsburgh, Pa
2002 – 2005	Associate Professor of Health Science and Adjunct Associate Professor of Physics, Duquesne University, Pittsburgh, Pa
1996 – 2005	Assistant Research Professor, University of Pittsburgh, Department of Mechanical Engineering and Material Science, Pittsburgh, Pa
2001 – 2005	Technical Director, Biomechanics Research Laboratory, Allegheny General Hospital, Pittsburgh, Pa
2002 – 2004	Director, Graduate Program in Rehabilitation Science, Duquesne University, Pittsburgh, Pa
1996 – 2002	Assistant Professor of Health Science and Adjunct Assistant Professor of Physics, Pittsburgh, Pa
1991 – 1996	Assistant Professor of Mechanical Engineering, University of Pittsburgh, Department of Mechanical Engineering, Pittsburgh, Pa.
1989 – 1990	Lecturer Department of Mechanical Engineering, University of Pittsburgh, Pittsburgh, Pa.
1985 – 1989	Teaching Assistant & Research Assistant, University of Michigan, Department of Mechanical Engineering and Applied Mechanics, Ann Arbor, Michigan
1984 – 1988	Instructor, Computer Science, Washtenaw Community College, Ypsilanti, Michigan
1982 – 1984	Biomedical Engineer, Orthopaedic Biomechanics Laboratory, Hines Veterans' Administration Hospital, Hines, IL
1980 – 1981	Design Engineer, Bechtel, Inc., Ann Arbor, Michigan

AWARDS & HONORS

Ranawat Award, 2001 Knee Society research award from the American Academy of Orthopaedic Surgeons, for "A Justification for the Use of the Epicondylar Axis for Femoral Component Rotation in TKA"

Tau Beta Pi, member, engineering honor society

Pi Tau Sigma, member, mechanical engineering honor society

Presidential Scholarship Award, 2001, Duquesne University

Federal Pacific Electric Graduate Fellowship, 1980

PROFESSIONAL SERVICE

Design and Rehabilitation Technical Committee Bioengineering Division, American Society of Mechanical Engineers, 2000 - present

Associate Editor, IEEE Transactions on Rehabilitation Engineering, 1999 - 2001

Chairman, Design and Rehabilitation Technical Committee, American Society of Mechanical Engineers, 1997 - 2000.

PUBLICATIONS IN SUBMISSION FOR PEER REVIEW:

Sotereanos, DG, Kokkalis, ZT, Darlis, NA, Zanaros, G, Altman, GT, Miller, MC, "Effects of Radiofrequency Probe Application on Irrigation Fluid Temperature in the Wrist Joint", *Journal of Hand Surgery*, accepted, in revision, December, 2008.

Kuxhaus, L, Schimoler, PJ, Viperman, MC, "Validation of a Feedback-Controlled Elbow Simulator Design: Elbow Muscle Moment Arm Measurement", *Journal of Medical Devices*, accepted, in revision, November 2008.

PEER REVIEWED PUBLICATIONS:

Kuxhaus, L, Schimoler PJ, Viperman, JS, Miller, MC, "Effects of camera switching on fine accuracy in a motion capture system", *Journal of Biomechanical Engineering*, to appear 2009.

Rutkowski, MM, Smolinski, PJ, Miller, MC, "The Geometry of Vacuum Assisted Interface Adhesion: Resistance to Axial Moment", *Vacuum*, **83** (2009), pp 869–872.

Conti, SF, Dazen, D; Stewart G; Green, A; Martin, R; Kuxhaus, L; Miller, MC, "Proprioception after total ankle arthroplasty", *Foot and Ankle International*, Vol 29, No 11, November, pp 1069-1073, 2008.

Shors. HC, Gannon, C, Miller, MC, Schmidt, CC, Baratz, ME, "Plain Radiographs Are Inadequate to Identify Overlengthening With a Radial Head Prosthesis", *Journal of Hand Surgery*, Vol 33A, p 335-339, 2008.

Galik, K, Baratz, ME, Butler, AL, Dougherty, J, Cohen, MS, Miller, MC, "The effect of annular ligament transection on radial head travel", *Journal of Hand Surgery*, Vol 32A, No. 8, p1218-1224, 2007.

PEER REVIEWED PUBLICATIONS (cont.)

- Sotereanos, N G, Miller, MC, Smith, B, Hube, R, Sewecke, JJ, Wohlrab, D, "Utilizing Intra-Operative Pelvic Landmarks for Acetabular Component Placement in Total Hip Arthroplasty", *Journal of Arthroplasty*, Vol. 21, No. 6, p 832-840, 2006.
- Miller, M C, Nair, M, Baratz, ME, "A Device for Assessment of Hand and Wrist Coronal Plane Strength", *Journal of Biomechanical Engineering*, pp. 998 – 1000, November, 2005
- Miller, M C, Galik, K, Conti, S, Smolinski, PJ, "Stresses in the Polyethylene Liner of a Semi-Constrained Ankle Replacement", *Journal of Biomechanical Engineering*, pp. 636-640, October, 2004.
- Mamo, D.C., Pollock, B.G., Mulsant, B., Houck, P.R., Bensasi, S., Miller, M.C., Redfern, M.S., Reynolds, C.F., "The Effects of Nortriptyline and Paroxetine on Postural sway in Depressed Elderly Patients", *American Journal of Geriatric Psychiatry*, 10(2) 199-205, 2002 .
- Miller, M.C., Berger, RA., Petrella, AJ, Rubash, HE, "A Justification for the Use of the Epicondylar Axis for Femoral Component Rotation in TKA", *Clinical Orthopaedics and Related Research*, Number 392, pp 38-45, 2001.
- Miller, M.C., Zhang, X., Berger, R., Petrella, A.J., Karmas, A, Rubash, H, "The effect of component rotation and component placement on knee knee kinetics after arthroplasty with a semi-constrained prosthesis", *Journal of Orthopaedic Research*, Vol. 19 (4), 2001, p 614-620.
- Smolinski, P, Hake, R, Onipede, D, Miller, M, "A computational and experimental dynamics project for an integrated engineering curriculum", *Computer Applications in Engineering Education*, Vol. 9 (1), p 1-7, 2001.
- Spotts, V.J., Miller, M.C., "Time and frequency analysis of emg signals with steady-state-dynamic and transient loading of the biceps", *International Journal of Electromyography and Kinesiology*, 10, (2000) p 15-23.
- Mamo DC, Sweet RA, Mulsant BH, Pollock BG, Miller MC, Stack JA, Begley AE, Reynolds CF, Effect of nortriptyline and paroxetine on extrapyramidal signs and symptoms: A prospective double-blind study in depressed elderly patients, *American Journal for Geriatric Psychiatry*, Summer; 8(3): 226-31, 2000.
- Ebig, M., Burdett, R, Pincivero, D, Lephart, S, Miller, M, "The effect of sudden inversion stress on emg activity of the peroneal and tibialis anterior muscles in the chronically unstable ankle", *Journal of the Orthopaedic and Sports Physical Therapy*, Aug, p. 73-77, 1997.
- Shelley, F., Anderson, D., Kolar, M., Miller, M., Rubash, H., "Modeling Hip Joint Forces in Stair Climbing", *IMEchE*, V 210, p. 65-68, 1996.
- Laghrissi-Thode, F., Pollock, BG, Miller, M.C., Mulsant, B , "Double-blind comparison of paroxetine and nortriptyline on the postural stability of late-life depressed patients", *Psychopharmacology Bulletin*, Vol. 34(4) p 659-663, 1995
- Laghrissi-Thode, F., Pollock, BG, Miller, M.C., Rachid, K, Altieri,L, "Comparative assessment of sertraline and nortriptylene on body sway in older depressed patients", *American Journal of Geriatric Psychiatry*, 3(3): 217-228, 1995.
- Zindrick MR, Knight GW, Bunch WH, Miller MC, Butler DM, Lorenz M, Behal R., "Factors Influencing the Penetration of Wires into the Neural Canal During Segmental Wiring", *Journal of Bone and Joint Surgery*, p. 742-750, 1989.

ABSTRACTS WITH CONFERENCE PRESENTATIONS (PRESENTER IS LISTED FIRST)

- Cook, HA, Miller, MC, Tupic, TM, Altman, DT, Altman, GT, “Lower Stresses Occur with a Piriformis Fossa than a Greater Trochanter Enty During Femoral Intramedullary Nail Insertion: a Modeling Study”, Transactions of the Orthopaedic Research Society 55th Annual Meeting, 2009
- Kuxhaus, L, DeMeo, PJ, Thomines, F, Flamm, A, Schimoler, PJ, Brogdon, ML, Vipperman, JS, Miller, MC; “Measurement of elbow medial ulnar collateral ligament strain: choice of reference length reduces interspecimen variability”, American Society for Biomechanics – August, 2008
- Brogdon, ML; Kuxhaus, L; DeMeo, PJ, Schimoler, PJ, Flamm, A, Vipperman, J; Miller, MC; “Physiologic Length of the UCL: At What Flexion Angle Do the Bands of the Anterior Bundle Have Zero Strain?”, 16th International Conference on Mechanics in Medicine and Biology, 2008
- Miller, MC, Clemente, J, Drabicki, R, Baratz, ME; “Functional Strength Testing of Radial and Ulnar Deviation Before and After CMC Arthroplasty”, International Society of Electromyography and Kinesiology, 2008
- Miller, MC; Vipperman, JS; Schimoler PJ, Kuxhaus, L; Flamm, A; Budny, D, “Accuracy and Precision of a Control System for an Elbow Joint Simulator”, Proceedings of the 2008 ASME Bioengineering Conference.
- Miller, MC, Thomines, F, Kuxhaus, L, Flamm, A, Schimoler, PJ, Vipperman, JS, DeMeo, PJ, “Tensile Strain Measurement of the Bands of the Medial Ulnar Collateral Ligament”, 54th Annual Meeting of the Orthopaedic Research Society, 2008.
- Schimoler PJ, Vipperman JS, Kuxhaus L, Flamm A, Budny DD, Baratz ME, Miller MC, “Control System for an Elbow Joint Motion Simulator”, Paper 42806, ASME International Mechanical Engineering Conference and Exhibition, 2007.
- Kuxhaus L, Schimoler PJ, Flamm, AM, Vipperman, JS, Baratz ME, Miller MC, “Moment Arm Measurement to Validate a Closed-Loop Feedback-Controlled Elbow Joint Simulator”, 31st Annual Meeting of the American Society of Biomechanics, 2007.
- Schimoler PJ, Vipperman, JS, Flamm, AM, Budny, DD, Baratz ME, Miller MC, “Switching Control to Actuate Elbow Motion”, 31st Annual Meeting of the American Society of Biomechanics, 2007.
- Kuxhaus L, Schimoler PJ Vipperman, JS, Baratz ME, Miller MC, “Changes In Camera Visibility Affect Measured Marker Motion” Proceedings of the Summer Bioengineering Conference, 2007.
- Kuxhaus L, Schimoler PJ, Vipperman JS, Flamm A, Budny, DD, Baratz ME, DeMeo P, Miller, MC, “Measuring Moment Arms Using Closed-Loop Force Control with an Elbow Simulator”, Proceedings of the Summer Bioengineering Conference, 2007.
- Miller, M C, Dazen, D; Martin R, Stewart, G W;Conti, S F., “Total Ankle Arthroplasty Does Not Affect Ankle Position Sense: Testing with Robotic Actuation” 53rd Annual Meeting of the Orthopaedic Research Society, 2007.
- Kuxhaus, L, Martin’ C, Galik, K, Adrian L. Butler, A L, Flamm, A, Baratz, ME, Miller, MC, “A computer model to evaluate radial head translation”, World Congress of Biomechanics, Munich, Germany, 2006.

ABSTRACTS WITH CONFERENCE PRESENTATIONS (PRESENTER IS LISTED FIRST) (CONT.)

- Miller, MC, Dréau, K, Dazen, D, Martin, R, Kali Arnold, K, Conti, S F, “Measurement of ankle proprioception under self-driven servocontrol”, World Congress of Biomechanics, Munich, Germany, 2006.
- Darlis, NA, Miller, MC, Dazen, D, Konstantin, JK, Weiser, RW, Sotereanos, DG; “The Effects of Radiofrequency Probe Application on Irrigation Fluid Temperature in the Wrist Joint”, Transactions of the Orthopaedic Research Society, 2006.
- Miller, MC, Galik, K, Kuxhaus, L, Butler, A, Cohen, MS, Baratz, ME, “Transection of the Annular Ligament Affects Radial Head Travel, but not the Axis Location in Supination-Pronation”, Transactions of the Orthopaedic Research Society, 2006.
- Miller, MC, Galik, K, Kuxhaus, L, Butler, A, Cohen, MS, Baratz, ME, “Translation and Travel of Monoblock and Bipolar Radial Head Replacements during Supination-Pronation” Pronation”, Transactions of the Orthopaedic Research Society, 2006.
- Butler, AL, Miller, MC, Galik K, Baratz, ME, “Translational Kinematics of the Radial Head before and after Radial Head Replacement”, Annual Meeting of the American Society for Surgery of the Hand, San Antonio, 2005.
- Kuxhaus, L, Viperman, JS, Barratz, ME, Magnusen, JP, Miller, MC “Reproducing Physiologic Moment Arms With An Elbow Simulator”, XXth Congress of the International Society of Biomechanics and 29th Annual Meeting of the American Society of Biomechanics 2005.
- Miller, MC, Galik, K, Dazen, D, DeMeo, P, Baratz, ME, “The Effect of Annular Ligament Resection of Radial Head Kinematics”, Proceedings of the ASME Bioengineering Conference, 2005.
- Miller, MC, Nair, M, Baratz, ME, “Device Design for Hand Strength Testing”, Proceedings of the Design of Medical Devices Conference, April 2005.
- Miller, MC, Galik, K, Conti, SF, Smolinski, PJ, “The Effect of Polyethylene Liner Thickness on Stresses in Total Ankle Arthroplasty”, Proceedings of the Orthopaedic Research Society, Vol. 30, #317, 2005
- Galik, K, Miller, MC, He, J, Towsen A, Watson, AD, “Talonavicular Kinematics at Midsstance Resulting from Physiologic Muscle Loading”, Proceedings of the Orthopaedic Research Society, Vol 29, p 1276, 2004.
- Miller, MC, He, J, Smolinski, PJ, Donahue, K, Conti, SF, “Total Ankle Arthroplasty Improves Functional Measures of Gait”, 71st Annual Meeting of the American Academy of Orthopaedic Surgeons, Am. Ortho. Foot & Ankle Society Specialty Day, 2004.
- Chiang, PP, Miller, MC, and DeMeo, PJ, “Gait Analysis Following Medial Opening Wedge High Tibial Osteotomy” Paper # 291, 70th Annual Mtg. of the American Academy of Orthopaedic Surgeons, 2003

PATENT

A METHOD AND APPARATUS FOR ASSESSING HAND STRENGTH, with ME Baratz, J He, P. Devanny. Issued 26. December, 2006, Patent Number 7,152,471