

## **JOHN STAUDENMAYER**

### **EDUCATION**

- 1989-1992 B.A. (Mathematics) Williams College, Williamstown, MA, USA
- 1996-1998 M.S. (Operations Research) Cornell University, Ithaca, NY, USA
- 1998-2000 Ph.D. (Operations Research) Cornell University, Ithaca, NY, USA

### **PROFESSIONAL EXPERIENCE**

- 1998 - 2000 NIEHS Predoctoral Training Grant Fellow, Cornell University
- 2000 - 2001 NIEHS Postdoctoral Training Grant Fellow, Harvard School of Public Health, Department of Biostatistics
- 2001 - 2008 Assistant Professor, Dept. of Mathematics and Statistics, University of Massachusetts, Amherst
- 2008 - 2014 Associate Professor, Dept. of Mathematics and Statistics, University of Massachusetts, Amherst
- 2014 - present Professor, Dept. of Mathematics and Statistics, University of Massachusetts, Amherst

### **HONORS**

- 2016 Fellow of the American Statistical Association
- 2017 UMass Convocation Research and Creativity Award

### **PEER REVIEWED PAPERS**

Blankenship J, Chipkin S, Freedson P, Staudenmayer J, Lyden K, Braun B. (2019). Managing Free-Living Hyperglycemia with Exercise or Interrupted Sitting in Type 2 Diabetes. *J Appl Physiol.* 126(3):616-625.

Whitaker KM, Pettee Gabriel K, Buman MP, Pereira MA, Jacobs DR Jr, Reis JP, Gibbs BB, Carnethon MR, Staudenmayer J, Sidney S, Sternfeld B. Associations of accelerometer-measured sedentary time and physical activity with prospectively assessed cardiometabolic risk factors: the CARDIA Study. *J Am Heart Assoc.* 2019;8.

Keadle SK, Lyden K, Strath S, Staudenmayer J, Freedson PS. (2019). Perspectives for Progress - A Framework to Evaluate Devices that Assess Physical Behavior. *Exercise and Sport Sciences Reviews.* To appear.

Tudor-Locke C, Aguiar E, Han H, Ducharme s, Schuna J, Barreira T, Moore C, Busa M, Lim J, Sirard J, Chipkin S, Staudenmayer J. (2019). Walking cadence (steps/min) and intensity in 21-40 year olds: CADENCE-Adults. *International Journal of Behavioral Nutrition and Physical Activity.* 16: 1-11.

- Viskochil V, Lyden K, Staudenmayer J, Keadle S, Freedson P, Braun B. (2019). Elevated insulin levels following 7 days of increased sedentary time are due to lower hepatic extraction and not higher insulin secretion. *Appl. Physiol. Nutr. Metab.* To appear.
- Matthews C, Keadle S, Berrigan D, Staudenmayer J, F Saint-Maurice P, Troiano R, Freedson P. (2018). Influence of accelerometer calibration approach on MVPA estimates for adults. *Med Sci Sports Exerc.* 50(11): 2285-2291.
- Marcotte R, Petrucci G, Cox M, Freedson P, Staudenmayer J, Sirard J. (2018+). Estimating Sedentary Time from a Hip- and Wrist-Worn Accelerometer. *Med Sci Sports Exerc.* To appear.
- Ray E, Sasaki J, Freedson PS, Staudenmayer J. (2018). Physical Activity Classification with Dynamic, Discriminative Methods. *Biometrics.* 74: 1502–1511.
- Li H, Staudenmayer J, Wang T, Kozey-Keadle S, Carroll RJ. (2018). Three-part joint modeling methods for complex functional data mixed with zero-and-one inflated proportions and zero inflated continuous outcomes with skewness. *Statistics in Medicine.* 2018 Feb 20;37(4):611-626.
- Yue X, Nelson S, Kerr J, Godbole S, Patterson R, Merchant G, Abramson I, Staudenmayer J, Natarajan L. (2018). Statistical approaches to account for missing values in accelerometer data. *Stat Methods Med Res.* (4):1168-1186.
- Lyden K, Keadle K, Staudenmayer J, Freedson P. (2017). The activPAL Accurately Classifies Activity Intensity Categories in Healthy Adults. *Med Sci Sports Exerc.* 49:1022-1028.
- Greg P, Freedson P, Masteller B, Cox M, Staudenmayer J, Sirard J. (2017). Sensitivity of the Misfit Shine to Detect Changes in Laboratory-Based and Free-Living Physical Activity. *Journal for the Measurement of Physical Behaviour.* 1:18-25.
- Sasaki JE, Hickey AM, Staudenmayer JW, John D, Kent JA, Freedson PS. (2016). Performance of Activity Classification Algorithms in Free-Living Older Adults. *Med Sci Sports Exerc.* 48(5): 941-50.
- Kerr J, Patterson RE, Ellis K, Godbole S, Johnson E, Lanckriet G, Staudenmayer J. (2016). Objective Assessment of Physical Activity: Classifiers for Public Health. *Med Sci Sports Exerc.* 48(5):951-7.
- Ellis K1, Kerr J, Godbole S, Staudenmayer J, Lanckriet G. (2016). Hip and Wrist Accelerometer Algorithms for Free-Living Behavior Classification. *Med Sci Sports Exerc.* 48(5): 933-40.
- Li, H, Kozey-Keadle, S, Staudenmayer, J, Assaad, H, Huang, J, Carroll, RJ. (2015). Methods for three-level functional data to assess an exercise intervention trial. *Biostatistics.* 16(4): 754-71.
- Staudenmayer, J, He, S, Hickey, A, Sasaki, J, Freedson PS. (2015). Methods to estimate aspects of physical activity and sedentary behavior from high frequency wrist accelerometer measurements. *Journal of Applied Physiology.* 119(4): 396-403.
- Lyden, K, Kozey-Keadle, S, Staudenmayer, J, Braun, B, Freedson PS. (2015). Discrete features of sedentary behavior impact markers of cardiometabolic health. *Medicine and Science in Sports and Exercise.* 47(5): 1079-86.
- Li, H, Staudenmayer, J, Carroll, RJ. (2014). Hierarchical functional data with mixed continuous and binary measurements. *Biometrics.* 70(4):802-11.

- Ellis, K, Godbole, S, Marshall, S, Lanckriet, G, Staudenmayer, J and Kerr, J. (2014). Identifying active travel behaviors in challenging environments using GPS, accelerometers, and machine learning algorithms. *Front. Public Health*. Volume 2.
- Sarkar, A, Mallick, B, Staudenmayer, J, Pati, D, Carroll, RJ. (2014). Bayesian Semiparametric Density Deconvolution in the Presence of Conditionally Heteroscedastic Measurement Errors. *Journal of Computational and Graphical Statistics*. 23(4):1101-1125.
- Kozey-Keadle, S, Lyden, K, Libertine, A, Viskochil, R, Staudenmayer, J, Braun, B, Freedson PS. (2014). The independent and combined effects of exercise training and reducing sedentary behavior on cardiometabolic risk factors. *Applied Physiology, Nutrition, and Metabolism*. 39(7): 770-780.
- Lyden, K, Kozey-Keadle, S, Staudenmayer, J, Freedson PS. (2014). A method to estimate free-living active and sedentary behavior from an accelerometer. *Medicine and Science in Sports and Exercise*. 46(2): 386-97.
- Lyden, K, Petruski, N, Mix, S, Staudenmayer, J, Freedson PS. (2014). Direct Observation is a Valid Criterion for Estimating Physical Activity and Sedentary Behavior. *Journal of Physical Activity and Health*. 11(4):860-3.
- Kozey-Keadle, S, Libertine, Lyden, K, Staudenmayer, J, Freedson, PS. (2014). Changes in sedentary time and spontaneous physical activity in response to an exercise training and/or lifestyle intervention. *Journal of Physical Activity and Health*. 11(7): 1324-33.
- John D, Jeffer S, Staudenmayer J, Mavilia M, Freedson PS. (2013). Comparison of Raw Acceleration from the GENE A and ActiGraph™ GT3X+ activity monitors. *Sensors*. 13(11): 14754-63
- Altman, N, Balco, G, Crainiceanu, C, Gehrels, Qiu, J, Staudenmayer, J, Sullivan, P. (2013). Statistical Modeling of Changes in Relative Sea Level in Maine during the Holocene Era. *Environmetrics*. 24(5), 298-305.
- John D, Staudenmayer J, Freedson P. (2013). Simple to complex modeling of breathing volume using a motion sensor. *The Science of the Total Environment*, 454-455, 184-8.
- Liu S, Gao RX, John D, Staudenmayer J, Freedson P. (2013). Tissue artifact removal from respiratory signals based on empirical mode decomposition. *Ann Biomed Eng*. 41(5): 1003-15.
- Lyden K, Kozey-Keadle S, Staudenmayer J, Freedson P, Alhassan S. (2012). Energy cost of common activities in children and adolescents. *Journal of Physical Activity and Health*. 9: 62-69.
- Liu S, Gao R, He Q, Staudenmayer J, Freedson P. (2012). Improved regression models for ventilation estimation based on chest and abdomen movements. *Physiol Meas*. 33(1): 79-93.
- Staudenmayer J, Zhu W, Catellier DJ. (2012). Statistical considerations in the analysis of accelerometry-based activity monitor data. *Med Sci Sports Exerc*. 44(1 Suppl 1): S61-7.
- Liu S, Gao R, John D, Staudenmayer J, and Freedson P. (2012). Multi-Sensor Data Fusion for Physical Activity Assessment. *IEEE transactions on bio-medical engineering*, 59(3): 687-96.
- Lyden K, Kozey Keadle SL, Staudenmayer JW, Freedson PS. (2012). Validity of two wearable monitors to estimate breaks from sedentary time. *Med Sci Sports Exerc*, 44: 2243-2252.
- Kozey-Keadle S, Libertine A, Staudenmayer J, Freedson P. (2012). The Feasibility of Reducing and Measuring Sedentary Time among Overweight, Non-Exercising Office Workers. *J Obes*. 282-303.

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- Lyden K, Kozey SL, Staudenmeyer JW, and Freedson PS. (2011). A comprehensive evaluation of commonly used accelerometer energy expenditure and MET prediction equations. *Eur J Appl Physiol*, 111(2):187-201.
- Freedson, PS, Lyden, K, Kozey-Keadle, S, Staudenmayer, J. (2011). Evaluation of artificial neural network algorithms for predicting METs and activity type from accelerometer data: Validation on an independent sample. *Journal of Applied Physiology*, 111: 1804-1812.
- Kozey SL, Lyden K, Howe CA, Staudenmayer JW, Freedson PS. (2010). Accelerometer output and MET values of common physical activities. *Med Sci Sports Exerc*. 42(9): 1776-84.
- Kozey S, Lyden K, Staudenmayer J, Freedson PS. (2010). Errors in MET estimates of physical activities using  $3.5 \text{ ml} \times \text{kg}^{-1} \times \text{min}^{-1}$  as the baseline oxygen consumption. *J Phys Act Health*. 7(4):508-16.
- Liu, A, Qin, L, Staudenmayer, J. (2010). M-type smoothing spline ANOVA for correlated data. *Journal of Multivariate Analysis*. 101(10): 2282–2296.
- Howe, C, Staudenmayer, J, Freedson PS. (2009). Accelerometer Prediction of Energy Expenditure: Vector Magnitude vs. Vertical Axis. *Med Sci Sports Exerc*, 41(12): 2199-206.
- Staudenmayer J, Pober D, Crouter S, Bassett DR Jr, Freedson, PS. (2009). An artificial neural network to estimate physical activity energy expenditure and identify physical activity type from an accelerometer. *Journal of Applied Physiology*, 107: 1300-1307.
- Hasson, R, Haller, J, Pober, D, Staudenmayer, J, Freedson, PS. (2009). Validity of the Omron HJ-112 pedometer during treadmill walking. *Med Sci Sports Exerc*, 41(4): 805-809.
- Staudenmayer J. (2009). Comment on Nonparametric Prediction in Measurement Error Models by Carroll, Delaigle, and Hall. *Journal of the American Statistical Association*. 104, 993-1014.
- Staudenmayer J, Lake EE, Wand MP. (2009). Robustness for general design mixed models using the t-distribution. *Statistical Modeling*, 9(3): 235–255.
- Buonaccorsi, J, Staudenmayer, J. (2009). Statistical Methods to Correct for Observation Error in a Density-Independent Population Model. *Ecological Monographs*, 79(2), 299-324.
- Staudenmayer, J, Ruppert, D, Buonaccorsi, J. (2008). Density estimation in the presence of heteroskedastic measurement error. *Journal of the American Statistical Association*, 103, 726-736.
- Pober D, Staudenmayer J, Raphael C, Freedson P. (2006). Development of a novel analytical technique to assess physical activity using accelerometers. *Med Sci Sports Exerc*, 38:1626-1634.
- Staudenmayer, J, Buonaccorsi, J. (2006). Measurement error in a random walk model with applications to population dynamics. *Biometrics*, 62, 1178-1189.
- Calabrese, E, Staudenmayer, J, Stanek, E. (2006). Drug Development and Hormesis. *Drug Discovery and Development*, 9, 117- 123.
- Zhao, Y, Staudenmayer, J, Coull, B, Wand, MP. (2006). General Design Bayesian Generalized Linear Mixed Models. *Statistical Science*, 35-51.

Buonaccorsi, J, Staudenmayer, J, Carreras, M. (2006). Modeling observation error and its effects in a random walk / extinction model. *Theoretical Population Biology*, 70, 322-335.

Maselko, J, Kubzansky, L, Kawachi, I, Staudenmayer, J, Berkman, L. (2006). Religious service attendance and changes in pulmonary function in a high functioning elderly cohort. *Annals of Behavioral Medicine*, 245- 253.

Calabrese, E, Staudenmayer, J, Stanek, E, Hoffman, G. (2006). Hormesis Outperforms Threshold Model in NCI Anti-tumor Drug Screening Database. *Toxicological Sciences*, 94, 368-378.

Ganguli, B, Staudenmayer, J, Wand, MP. (2005). Additive Models with Predictors Subject to Measurement Error. *Australia and New Zealand Journal of Statistics*, 47, 193-202.

Staudenmayer, J, Buonaccorsi, J. (2005). Measurement Error in Linear Autoregressive Models. *Journal of the American Statistical Association*, 100, 841-852.

Wright, R, Finn, P, Contreras, JP, Cohen, S, Wright, RO, Staudenmayer, J, Wand, MP, Perkins, D, Weiss, S, Gold, DR. (2004). Chronic Caregiver Stress and IgE Expression, Allergen-induced Lymphocyte Proliferation, and Cytokine Profiles in a Birth-cohort Predisposed to Atopy. *Journal of Allergy and Clinical Immunology*, 1051- 1057.

Coull, B, Staudenmayer, J. (2004). Self-modeling Regression for Multivariate Curve Data. *Statistica Sinica*, 14, 695-711.

Staudenmayer, J, Ruppert, D. (2004). Local Polynomial Regression and SIMEX. *Journal of the Royal Statistical Society, Series B*, 66, 17-30.

Staudenmayer, J, Spiegelman, D. (2002). Segmented regression in the presence of covariate measurement error in main study / validation study designs. *Biometrics*, 58, 871-877.

Myatt, T, Staudenmayer, J, Adams, K, Walters, M, Rudnick, S, and Milton, D. (2002). A study of indoor carbon dioxide levels and sick leave among office workers. *Environmental Health: A Global Access Science Source*, 1-3.

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Aherns, C, Altman, N, Casella, G, Eaton, M, Hwang, GJT, Staudenmayer, J, Stefanescu, C. (2001). Leukemia clusters and TCE Wastesites in Upstate New York: How adding covariates changes the story. *Environmetrics*, 12, 659-672.

### **SELECTED FUNDING (Grants and Contracts)**

- Calibrating Free Living Physical Activity Characteristics Across Functionally Limited Populations Using Machine Learning. (NIH, R01.) PI on subcontract to University of Wisconsin. 4/1/16-3/30/21. \$2,500,000.
- Novel Accelerometer Calibration and Validation in Children and Adolescents (NIH, R01.) PI. 7/2/16-7/1/21. \$2,875,000.
- Cadence (steps per unit time). (NIH, R01.) Investigator. Tudor-Locke PI. 6/15/15-3/31/20. ~\$2,000,000.
- Misfit validation project. (Misfit.) Investigator. Boyer PI. 7/1/16-7/1/18. \$100,000.
- Measurement Error, Nutrition, Physical Activity and Cancer. (NIH.) Consultant. Carroll PI. 7/1/15-6/30/19. ~\$25,000.

- Objective Monitoring Solutions Service Program Package. (Actigraph/Anonymous Pharma.) PI. 5/15-9/18. ~\$250,000.
- Objective Monitoring Solutions Service Program Package. (Actigraph/ Anonymous Pharma.) Co-PI. Freedson PI. 5/14-9/16. ~\$175,000.
- Evaluation of consumer wearable sensors to estimate physical activity. (Reebok.) Investigator. Freedson PI. 6/14-8/14. ~\$57,000.
- Physical Activity Calibration in Individuals with Movement Limitations. (NIH, R21.) PI on subcontract to University of Wisconsin. Strath PI. 7/15/14-7/14/16. ~\$110,000.
- Behavioral database architecture for the storage, analysis, and reporting of biosignal datasets. (NIH SBIR.) PI on subcontract from Enformia. 9/13-9/15. ~\$50,000.
- Physical Activity Calibration. (NIH.) Consultant. Strath PI. 9/1/14-8/31/14.
- TREC: Physical Activity Measurement, (NIH.) Consultant. Kerr PI. 11-16. \$15,000.
- Technology to assess physical activity and sedentary behavior in aging adults with osteoarthritis. (UMass Life Sciences Moment Fund.) Co-PI. Freedson PI. 11/1/10 – 10/30/12. ~\$20,000.
- Advancing Physical Activity Measurement Using Pattern Recognition Techniques. (NIH-ARA Challenge Grant.) Co-PI. Freedson PI. 9/30/09 – 8/31/11. \$494,446.
- Development of an Integrated Measurement System to Assess Physical Activity. (NIH-U01.) Co-PI. Freedson PI. 8/1/07-6/30/11. \$2,195,835.
- Novel Analytic Methods for Estimating Physical Activity. (NIH-R01.) Co-PI. Freedson PI. 9/1/06-8/30/11. \$1,578,473.
- Comparison of the 7164 Actigraph to the GT1M Actigraph during Self- Paced Walking in Adults. (Contract from National Cancer Institute). Investigator, 07/07-5/31/08.
- Stress, Environment, and Genetics in Urban Asthma. (NIH-R01.) PI to subcontract from Channing Institute. 01/05-01/09. ~\$40,000.
- Pedometer Calibration and Energy Expenditure Estimation. (Omron, Inc.) Investigator, 05/06-06/06. \$5,000.
- Measurement Error in Time Series / Longitudinal Study Data. (NSF.) Co-PI. Buonaccorsi PI. 06/03-06/06. \$211,033.
- Measurement Errors in Cancer Epidemiology. (NIH-R01.) PI to subcontract from Harvard School of Public Health. Spiegelman PI. 06/02-09/02. \$20,000.

## **PROFESSIONAL SERVICE**

### Associate Editorship / Guest Editorship:

2016-	Associate Editor, <i>Journal of the Measurement of Physical Behaviour</i>
2007-2018	Associate Editor, <i>Biometrics</i>
2014-2018 2007-2011	Associate Editor, <i>Journal of the American Statistical Association</i>
2010-2016	Associate Editor, <i>Electronic Journal of Statistics</i>
2013-2014	Guest Editor. <i>Physiological Measurement</i> . Focus Issue on Ambulatory Monitoring of Physical Activity and Movement

### Ad hoc reviewer:

- American Journal of Epidemiology
- Biometrics
- Biometrika
- Communications in Statistics
- Computational Statistics and Data Analysis
- CRC Press
- Environmental Protection Agency
- Houghton-Mifflin
- Journal of Applied Physiology
- Journal of the American Statistical Association
- Journal of Agricultural, Biological and Ecological Statistics
- Journal of Physical Activity and Health
- Journal of the Royal Statistical Society
- Medicine and Science in Sports and Exercise
- Statistics in Medicine
- Statistica Sinica

Federal Grant Review Panels:

2010- Ad hoc member of the National Institutes of Health grant review panel. (KNOD panel: Kidney, Nutrition, Obesity, and Diabetes)

Professional Associations:

- American Statistical Association: Non-parametric statistics student paper award committee chair (2013-2014)
- American Statistical Association: Non-parametric statistics section treasurer. (2017-2019)
- Member American Statistical Association
- Biometric Society, ENAR

**PHD STUDENTS (Major Role)**

Major Role

- Yue Chang (Math and Stat), Major Advisor, (Current student, PhD)
- Vasin Suntayodom (Math and Stat), Major Advisor, (Current student, PhD)
- Albert Mendoza (Kinesiology), Committee Member, (2017 PhD). Currently an Assistant Professor at Cal State - Hayward.
- Jennifer Blankenship (Kinesiology), Committee Member, (2016 PhD). Currently a postdoc at University of Colorado)
- Evan Ray (Math and Stat), Major Advisor, (2015 PhD). Currently an Assistant Professor at Mount Holyoke College.
- Jeffer Sasaki (Kinesiology), Committee Member, (2014 PhD), Currently a post-doc at University of Illinois.
- Yue Zhao (Math and Stat), Major Advisor, (2012 PhD), Currently employed by Point72 Asset Management.

- Sarah Kozey-Keadle (Kinesiology), Committee Member, (2012 PhD). Currently an assistant professor at Cal-Poly.
- Kate Lyden (Kinesiology), Committee Member, (2012 PhD). Currently an independent consultant.
- Meng-Shiou Shieh (Math and Stat), Major Advisor, (2009 PhD). Currently a biostatistician at Bay State Medical Center.
- David Pober (Kinesiology), Committee Member, (2003-2007). Currently an Assistant Professor at Fitchburg State University.

#### Minor Role

- Scott Ducharme (Kinesiology), Committee Member
- Davit Kachatryan (Operations Management), Committee Member
- Damien Callahan (Kinesiology), Committee Member
- Marwan Mattar (Computer Science), Committee Member
- Gary Huang (Computer Science), Committee Member
- Rebecca Hassan (Kinesiology), Committee Member
- Anita Christie (Kinesiology), Committee Member
- Moon-Yong Baek (Resource Economics), Committee Member
- Brooke Stephens (Kinesiology), Committee Member
- Wei Li (Computer Science), Committee Member
- Vanessa Murdock (Computer Science), Committee Member
- Jennifer Neville (Computer Science), Committee Member
- Gary Holness (Computer Science), Committee Member
- Ying Lu (Education), Committee Member
- Raj Gupta (Computer Science), Committee Member
- Ramesh Nallapati (Computer Science), Committee Member