

Nathaniel H. Hunt, PhD

Assistant Professor
UC Berkeley Chancellor's Fellow
NSF CiBER IGERT Fellow

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Research Interests

Biomechanics, Movement variability, Nonlinear Dynamical Systems, Motor Control and Learning

Professional Preparation

2012.7- 2017.5	University of California, Berkeley Poly-PEDAL Lab Center for Interdisciplinary Bio-Inspiration in Education and Research Dissertation: <i>Unsteady Maneuvers in Arboreal Locomotion</i>	PhD Integrative Biology NSF CiBER-IGERT Fellow UC Berkeley Chancellor's Fellow Advisor: Robert J. Full
2010.5- 2012.5	University of Nebraska, Omaha Nebraska Biomechanics Core Facility Thesis: <i>Manipulating Gait Variability with Fur Elise: Chaotic and Fractal Variations</i>	MS Exercise Science Advisor: Nicholas Stergiou
2002.5- 2010.5	University of Nebraska, Lincoln High Energy Particle Physics Research Group	B.S. Physics Track: Computational Methods Minor Mathematics
2006.8	Henry H Lind Non-Commissioned Officer Academy	Rank: Sergeant Honor Graduate
2004.5- 2005.8	Deployed in Operation Iraqi Freedom	Iraq Campaign Medal Global War on Terrorism Service Medal

Awards

2012-2017	Chancellor's Fellowship, University of California, Berkeley
2012-2015	Center for Interdisciplinary Bio-Inspiration in Research and Education Fellowship, National Science Foundation
2015	Fellowship of Graduate Student Travel, Society for Integrative and Comparative Biology
2014	Mentoring Summer Undergraduate Research Fellowship
2012	NASA Nebraska Travel Grant
2011-2012	NASA Nebraska Fellowship
2011	NASA Nebraska Travel Grant
2010-2011	NASA Nebraska Fellowship

Publications

Book Chapters

Published

1. Autocorrelation, Mutual Information, and Correlation Dimension; Nonlinear Analysis for Human Movement Variability

Journal Publications

Published in Peer-Reviewed Scientific Journals

1. Yentes J, Hunt N, Schmidt K, Kaipust J, McGrath D, Stergiou N, The appropriate use of approximate entropy and sample entropy with short data sets, Annals of Biomedical Engineering
2. Hunt N, McGrath D, Stergiou N, The influence of auditory motor coupling on fractal dynamics in human gait, Scientific Reports
3. Decker LM, Cignetti F, Hunt N, Potter JF, Studenski SA, Effects of aging on the relationship between cognitive demand and step variability during dual-task walking, Age
4. Full RJ, Jayaram K, Li C, Naik, S Hunt N, Lee C, Bio-Inspired Principles of Extended Terrain Mobility, Micro Autonomous Systems and Technology

In Preparation

1. Hunt, N., Full, RJ Rolling Maneuver and Inverted Running Capability Increase Rod Running Robustness, Journal of Experimental Biology
2. Hunt, N., Jinn, J., Jacobs, L. Full RJ. Error based motor learning enables free ranging Fox Squirrels to recalibrate a highly developed motor skill in the face of a dynamic perturbation.
3. Hunt, N., Jinn, J., Jacobs, L. Full RJ. Parkour-like wall jump maneuver adds intermediate control phase to targeted leaping.

Published Conference Abstracts

1. Hunt, N., Hammond, A., Burnett, N.P., Pritchard-Berman, M., Full, R.J., Stability of Cockroaches Running Rapidly on Rigid Rods. Society of Integrative and Comparative Biology 2013. Austin, Texas
2. Hunt, N.; Jinn, J; Libby, T; Jacobs, LF; Full, RJ, Learning to launch: targeted leaping from a dynamic obstacle in squirrels, Society of Integrative and Comparative Biology 2014. West Palm Beach, FL

Conference Presentations

3. Hunt, N., Stergiou, N., Effects of Chaotic Music on Movement Patterns. Proceedings of the 121st Nebraska Academy of Sciences Annual Meeting. Lincoln, Nebraska. 2011.
4. Hunt, N., Investigating the Effects of Various Kinds of Chaotic Auditory Stimulus on the Walking Patterns of Both Human Subjects and a Computer Model. Proceedings of the 121st Nebraska Academy of Sciences Annual Meeting. Lincoln, Nebraska. 2012.
5. Hunt, N., Haworth, J., McGrath, D., Myers, S., Stergiou, N., Manipulation of the Structure of Gait Variability with Rhythmic Auditory Stimulus. Proceedings of the American Society of Biomechanics 2012 Meeting. Gainesville, Florida, August 2012
6. Schieber, M, Decker, L, Hunt, N., Myers, SA, Aging Impacts Structure of Gait Variability While Dual-Tasking, The Gerontological Society of America
7. Liu, X, Decker, L, Hunt, N., Myers, SA, The variability of minimum toe clearance decreases in both healthy young and healthy older adults during dual-task treadmill walking, The Gerontological Society of America

Conference Posters

1. Hunt, N., Decker, L., Stergiou, N. Phonological dual-task interference affects walking regularity. University of Nebraska Centennial Celebration of Student Research and Creative Activity. Omaha, Nebraska, April 2011.
2. McGrath, D., Wurdeman, S., Yentes, J., Hunt, N., Myers, S., Stergiou, N. Metabolic Cost of Postural Control During a Perturbed Gait Task is Related to Gait Variability. Proceedings of the American Society of Biomechanics 2012 Meeting. Gainesville, Florida, August 2012
3. Renz, J., Vallabhajosula, S., Hunt, N., Chien, J., Stergiou, N. Differences in Stride Interval Variability During Stair-Climbing and Treadmill Walking. Proceedings of the American Society of Biomechanics 2012 Meeting. Gainesville, Florida, August 2012
4. Vallabhajosula, S., Renz, J., Chien, J., Hunt, N., Stergiou, N., Influence of Stepping Rate on Stride Interval Variability of Stair Climbing. Proceedings of the American Society of Biomechanics 2012 Meeting. Gainesville, Florida, August 2012
5. Hunt, N., Stergiou, N., Manipulation of the Structure of Gait Variability with Rhythmic Auditory Stimulus. Society for Integrative and Comparative Biology 2013. San Francisco, CA
6. Hunt, N.; Jinn, J; Libby, T; Jacobs, LF; Full, RJ, Learning to launch: error-based learning drives changes in performance variables, Society for Integrative and Comparative Biology 2016. Portland, OR

Teaching Experience

2012	Nonlinear Analysis Workshop
2012	Guest Speaker, Biomechanics Seminar (IB 232), Integrative Biology, University of California, Berkeley
2012	Guest Speaker, Biomechanics Seminar (IB 232), Integrative Biology, University of California, Berkeley
2013	Guest Speaker, Biomechanics Seminar (IB 232), Integrative Biology, University of California, Berkeley

- 2014 Guest Speaker, Biomechanics Seminar (IB 232), Integrative Biology, University of California, Berkeley
- 2015 Guest Speaker, Biomechanics Seminar (IB 232), Integrative Biology, University of California, Berkeley
- 2016 Teaching Assistant, Bio-Inspired Design (IB 32), Integrative Biology, University of California, Berkeley
- 2017 Teaching Assistant, Bio-Inspired Design (IB 32), Integrative Biology, University of California, Berkeley

Reviewer Responsibilities

Journal Article Reviews

Chaos

Motor Control

Mentoring

Graduate Students

- 2014 Tony Worhl, Sports Science, FSU Jena
- 2015 Ben McInroe, Biophysics, UC Berkeley
- 2015 Shilpa Naik, Integrative Biology, UC Berkeley

Undergraduate Students

- 2010 Brian Arnold, University of Nebraska, Omaha
- 2011 Jessica Renz, University of Nebraska, Omaha
- 2012 Leo Moon, University of California, Berkeley
- 2013-2016 Crystal Lee, University of California Berkeley (awarded summer research fellowship)
- 2013 Han K. Lam, University of California, Berkeley, (finalist for summer research fellowship)
- 2014-2015 Ivonne Fajardo, University of California, Santa Cruz
- 2015 Dhvani Patel, University of California, Berkeley
- 2015 Jaron Armiger, University of California, Berkeley
- 2015 Prithvi Akella, University of California, Berkeley

Professional Affiliations

Society for Neuroscience

American Society of Biomechanics

Society of Integrative and Comparative Biology

Consulting

Sigma Sports – Wearable devices for team sports

Contributions

Sensor Fusion

State Estimation

Energetics Modeling

Behavior Classification with Machine Learning

Data Visualization

Data Interpretation

Graduate Level Courses

Computer Science

Artificial Intelligence

Machine Learning (audited)

Deep Reinforcement Learning (audited)

Mathematics

Dynamical Systems and Chaos

Modeling Networks

Biomechanics

Advanced Statistics

Motor Control

Doctoral Seminar

Advanced Biomechanics

Biology

Mechanics of Organisms

Evolution

Teaching Colloquium

Research & Outreach

Seminar in Biomechanics

Seminar in Locomotion and Energetics

Engineering

Control Theory (audited)

Nonlinear Systems, Identification and Control (audited)

Programming Languages Experience

MATLAB, C, C++, OpenGL, Python, JAVA, HTML, MySQL, Prolog

GRE Scores

Verbal: 610

Math: 800

Writing: 4.0

References

Robert J. Full

Doctoral Advisor

Chancellor's Professor

Department of Integrative Biology

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Doctoral Dissertation Committee

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