

DEVIN L. JINDRICH

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EDUCATION

2001	Ph. D.	University of California, Berkeley	Integrative Biology
		(Emphasis on comparative biomechanics and physiology).	
1993	B.A.	University of California, Berkeley	Integrative Biology

HONORS

2002	World Congress of Biomechanics Calgary Award finalist.
1996	National Science Foundation Graduate Research Fellowship awardee.
1996	Department of Defense Graduate Fellowship Honorable Mention.
1995	Acceptance to the Santa Fe Institute's Complex Systems Summer School, full funding (attended).
1990	Pacific Rim Scholarship to attend the University of California's Education Abroad field biology course in Monteverde, Costa Rica.

PROFESSIONAL POSITIONS

06/16-present	Associate Professor, Kinesiology	California State University, San Marcos
01/16 - 06/16	Chair, Kinesiology	California State University, San Marcos
01/12-05/16	Assistant Professor, Kinesiology	California State University, San Marcos
05/10-01/12	Assistant Professor, School of Life Sciences	Arizona State University
	Graduate faculty in Mechanical Engineering	Arizona State University
01/07-05/10	Assistant Professor, Kinesiology	Arizona State University

- * **Director, The Laboratory for Integrative Motor Behavior.** Discovering fundamental principles of biomechanics and motor control, interpreting these principles in the context of the physical and occupational environment, and applying basic research discoveries to problems in biomedicine and public health.

04/04-12/06 **Assistant Researcher** **UCLA**

- * **Understanding neuromuscular plasticity towards restoring function after spinal cord injury.** Research in musculoskeletal biomechanics, motor control, and neural plasticity towards improving rehabilitation treatments and developing neural prostheses for improved function after spinal cord injury. V. Reggie Edgerton, P.I.

06/01-10/03 **Research Fellow** **Harvard School of Public Health**

- * **Finger mechanics during typing: towards improved keyboard and workstation design to prevent musculoskeletal disorders.** Conducted experiments to measure forces of tendons, muscles and bones in the hand as a function of computer keyswitch design and posture to estimate musculoskeletal exposure during computer keyboard and workstation use. Funded by the Whitaker foundation, Jack Dennerlein, P.I.

8/95-05/01 **Graduate Research Assistant** **University of California at Berkeley**

- * **Locomotion biomechanics and biological inspiration of robot design.** Initiated, designed, implemented and published original research on the stability, maneuverability and control of rapid running in insects. Worked with team of scientists and engineers on a multidisciplinary computational neuromechanics project sponsored by the Defense Advanced Research Project Agency (DARPA) Controlled Biological Systems Program and the Office of Naval Research (ONR). Developed two experimental techniques new to biology that allowed measurements previously impossible using existing methods. These experiments developed and verified of new analytical and mathematical models of stability and maneuverability during rapid locomotion. Worked with engineers to apply these findings to

robot design (prototypes were built at McGill University and Stanford University, and subjects of current study at more than six research laboratories).

- * **Dynamic computer simulation.** With engineers at M.I.T. and The University of Michigan, and mathematicians at Princeton and Cornell, developed 2-D mathematical models of animal locomotion and 3-D, dynamic computer simulations using MATLAB, ADAMS and Boston Dynamics (implemented in C using SD-FAST) packages.

8/95-8/97

Representative

UCB Instructional Technologies

- * **Instructional technology.** Represented graduate students from the biological sciences to the U.C. Berkeley Instructional Technologies Program. Designed and implemented websites for poly-pedal lab and several courses in the Integrative Biology department. Initiated a project to develop a 'Virtual Classroom Kit', and contributed to the development of a 'Shared Discoveries' program to facilitate the use of current research in instruction.
- * **Scientific visualization.** Contributed to structuring the Department of Integrative Biology's Scientific Visualization Center. Advised purchase of over \$1.3 million in equipment and software. Set up and maintained the center six months before permanent staff were hired. Sought collaboration with companies interested in biological data through presentation and booth at 1996 ACM SIGGRAPH.

6/93-7/95

Research Assistant

University of California at Berkeley

- * **Experimental design.** Contributed to the development of a novel technique using photoelastic gelatin to make the first simultaneous measurements of single-leg ground-reaction forces in arthropods.
- * **Physiological ecology.** Tested hypothesis that nocturnal lizards exhibit lower metabolic cost of transport (energy per unit distance) than diurnal lizards.
- * **Technology support.** Maintained a heterogeneous computing environment of Apple Macintoshes, Windows 98 and NT machines, and Silicon Graphics workstations.

7/91-8/92

Research Assistant

InfoUse, Emeryville, CA

- * **Public health research.** Research on nutrition and cancer for Phase I interactive computer program. Implemented a pilot Expert System using the Level V language to assist vocational rehabilitation case workers.

TEACHING EXPERIENCE

Curriculum development and administration

- 2011 Graduate of the HHMI and National Academies' Summer Institute (undergraduate instruction)
- 2010-11 Member, Curriculum Reform Committee, School of Life Sciences, Arizona State University
- 2009-10 Director, Graduate Studies, Dept. of Kinesiology, Arizona State University

Courses Taught

- Kinesiology 301 – Motor Control and Learning (CSUSM)
- Biology 181 – Introduction to Biology (ASU)
- Kinesiology 494/598 – Comparative Biomechanics and Motor Control (ASU)
- Kinesiology 345 – Motor Control, Development, and Learning (ASU)
- Integrative Biology 150 (Berkeley) – *Physiological Ecology*. GSI with Professor Robert J. Full.
- Integrative Biology 150L (Berkeley) – *Physiological Ecology Laboratory*. GSI with Professor Robert J. Full.
- Integrative Biology 160 (Berkeley) – *Evolution*. GSI with Professor David Wake.

LANGUAGES SPOKEN

English (primary), Spanish (Conversational)

SERVICE

PROFESSIONAL SERVICE

Journal Referee

Ad-Hoc reviewer for: *Journal of Experimental Biology*, *Journal of Biomechanics*, *Journal of Neuroscience*, *Exercise and Sport Sciences Reviews*, *Integrative and Comparative Biology*, *Journal of Neurophysiology*, *Medical Engineering and Physics*, *Transactions on Neural Systems & Rehabilitation Engineering*, *IEEE Transactions on Biomedical Engineering*, *Journal of Experimental Zoology*, *Journal of Theoretical Biology*, *Journal of Mathematical Biology*, *Journal of Applied*

Biomechanics, Biological Cybernetics, Chaos, Neuroscience, Journal of Biomechanical Engineering, PLoS Computational Biology, Ergonomics, Journal of Human Evolution, American Journal of Physical Anthropology, PLoS One, Proceedings of the Royal Society B, Journal of the Royal Society Interface, Physical Biology, SpringerPLUS, Bioinspiration and Biomimetics

Grant Reviewer

- 2016 Panelist reviewer for Joint Warfighters Medical Research Program (Department of Defense)
- 2015 Ad-Hoc reviewer for Congressionally Directed Medical Research Programs Spinal Cord Injury Research Program (SCIRP; Department of Defense)
- 2014 Ad-Hoc reviewer for Joint Warfighters MRP (Department of Defense)
- 2014 Panelist reviewer for Joint Warfighters Medical Research Program (Department of Defense)
- 2012 Panelist reviewer for Congressionally Directed Medical Research Programs Spinal Cord Injury Research Program (SCIRP) (Department of Defense)
- 2012 Panelist reviewer for Congressionally Directed Medical Research Programs Spinal Cord Injury Research Program (SCIRP; Department of Defense)
- Ad-Hoc reviewer for: National Science Foundation, Craig H. Neilsen Foundation.

UNIVERSITY SERVICE

- 2012-2013 CEHHS Representative, Long-term Academic Master Plan (LAMP) committee (CSUSM)
- 2015-2016 Selection for and participation in CSUSM Campus Connect

COLLEGE SERVICE

- 2013-2014 Kinesiology Representative, Budget and Academic Planning (BAPC) committee (CSUSM)
- 2012-2013 Kinesiology Representative, Dean's Advisory committee (CSUSM)

DEPARTMENT SERVICE

- 2012-2015 Faculty Advisor, Pre-Physical Therapy option (~70 students) (CSUSM)
- 2010-11 Member, Curriculum Reform Committee, School of Life Sciences, Arizona State University
- 2009-10 Director, Graduate Studies, Dept. of Kinesiology, Arizona State University

PUBLICATIONS

1. 2016 D. Asakawa, J.T. Dennerlein and **D. L. Jindrlich**. Performance and Index Finger Kinematics For Common Touchscreen Gestures. (In Press).
2. 2016 M. Qiao† and **D. L. Jindrlich**. Leg Joint Function During Walking Acceleration and Deceleration. *Journal of Biomechanics* Jan 4;49(1):66-72.
3. 2016 M.B. Trudeau, D.S. Asakawa, **D.L. Jindrlich** and J.T. Dennerlein. Two-handed grip on a mobile phone affords greater thumb motor performance, decreased variability, and a more extended thumb posture than a one-handed grip. *Applied Ergonomics* **52**:24e28.
4. 2015 J.H. Lee†, D.S. Asakawa#, J.T. Dennerlein and **D.L. Jindrlich**. Finger muscle attachments for an OpenSim upper-extremity model. *PLoS One*. 2015 Apr 8;10(4):e0121712.
5. 2015 B. K. Hillen, **D. L. Jindrlich**, J. J. Abbas, G T. Yamaguchi, R. Jung. Effects of spinal cord injury induced changes in muscle activation on foot drag in a computational rat ankle model. *Journal of Neurophysiology*. 2015 Apr;113(7):2666-75.
6. 2015 J.H. Lee†, D.S. Asakawa#, J.T. Dennerlein and **D.L. Jindrlich**. Extrinsic and intrinsic index finger muscle attachments in an OpenSim upper-extremity model. *Annals of Biomedical Engineering*. 2015 Apr;43(4):937-48.
7. 2014 M.B. Trudeau, E.M. Sunderland, **D.L. Jindrlich** and J.T. Dennerlein. A data-driven design evaluation tool for handheld device soft keyboards. *PLoS One*. 2014 Sep 11;9(9):e107070.
8. 2014 M. Qiao† and **D. L. Jindrlich**. Compensations during unsteady locomotion. *Integrative and Comparative Biology*. 54(6):1109-21.
9. 2014 M. Qiao†, B. Brown*, and **D. L. Jindrlich**. Compensations for increased rotational inertia during human cutting turns. *Journal of Experimental Biology*. **217**(3): 432-43.
10. 2013 M.B. Trudeau, P.J. Catalano, **D.L. Jindrlich**, J.T. Dennerlein. Tablet Keyboard Configuration Affects Performance, Discomfort and Task Difficulty for Thumb Typing in a Two-Handed Grip. *PLoS One*. 8(6): e67525.
11. 2012 M. Qiao†, **D.L. Jindrlich**. Task-level strategies for human sagittal-plane running maneuvers are consistent with robotic control policies. *PLoS One*.7(12):e51888

12. 2012 M.B. Trudeau, J.G. Young, **D.L. Jindrlich**, J.T. Dennerlein. Thumb motor performance varies with thumb and wrist posture during single-handed mobile phone use. *J Biomech.* **45**(14):2349-54.
13. 2012 W. L. Johnson[†], **D. L. Jindrlich**, R. R. Roy, and V. R. Edgerton. Quantitative metrics of spinal cord injury recovery in the rat using motion capture, electromyography and ground reaction force measurement. *J Neurosci Methods.* **206**(1):65-72.
14. 2011 A. Takeoka, **D. L. Jindrlich**, C. Munoz-Quiles, H. Zhong, R. van den Brand, D. Pham, M. Ziegler, A. Ramon-cueto, R. Roy, V. R. Edgerton, and P. Phelps. **Functional axon regeneration occurs after OEG transplantation.** *Journal of Neuroscience*, **16**;31(11):4298-310.
15. 2011 **D.L. Jindrlich**, G. Courtine, H.L. McKay, R. Moseanko, T.J. Bernot, R.R. Roy, H. Zhong, J.J. Liu, M.H. Tuszynski, V.R. Edgerton. **Unconstrained three-dimensional reaching movements by Rhesus monkeys.** *Experimental Brain Research*, **209**:35-50.
16. 2011 W. L. Johnson[†], **D. L. Jindrlich**, H. Zhong, R. R. Roy, and V. R. Edgerton. **Application of a rat hindlimb model: A prediction of force spaces reachable through stimulation of nerve fascicles.** *IEEE Transactions on Biomedical Engineering*, **58**(12):3328-38.
17. 2010 E. S. Rosenzweig, G. Courtine, **D. L. Jindrlich**, J. H. Brock, S. Strand, A. R. Ferguson, Y. Nout, R. R. Roy, D. Miller, M. Beattie, L. A. Havton, J. Bresnahan, V. R. Edgerton, and M. H. Tuszynski. **Extensive Spontaneous Plasticity of Corticospinal Projections After Primate Spinal Cord Injury.** *Nature Neuroscience*, **13**(12):1505-10.
18. 2009 **D.L. Jindrlich**, M. S. Joseph, C.K. Ootoshi, R.Y. Wei, H. Zhong, R. R. Roy, N.J.K Tillakaratne., V.R. Edgerton. **Spinal learning in the adult mouse using the Horridge Paradigm.** *Journal of Neuroscience Methods*, **182**(2):250-4.
19. 2009 **D.L. Jindrlich** and M. Qiao[†]. Maneuvers During Legged Locomotion. *Chaos*, **19**(2), 026105.
20. 2009 D. L. Lee, P-L. Kuo, **D.L. Jindrlich**, J. T. Dennerlein. **Computer Keyswitch Force-Displacement Characteristics Affect Muscle Activity Patterns During Index Finger Tapping.** *Journal of Electromyography and Kinesiology*, **19**(5):810-20.
21. 2008 R.M. Ichiyama, Y. Gerasimenko, **D. L. Jindrlich**, H. Zhong, R. R. Roy, V. R. Edgerton. **Combining epidural stimulation and the 5-HT agonist quipazine induces acute plantar stepping after a complete spinal cord transection in adult rats.** *Neuroscience Letters*. **438**: 281-285.
22. 2008 Johnson, W.L.[†], **Jindrlich, D.L.**, Roy, R.R., Edgerton, V.R. **A musculoskeletal model of the rat hindlimb.** *Journal of Biomechanics*, **41**:610-619.
23. 2008 M.D. Kubasak, **D.L. Jindrlich**, Zhong H, Takeoka, A, McFarland, KC, Munoz-Quiles, C, Roy RR, Edgerton VR, Ramón-Cueto A, Phelps PE. **Step training enhances improvements in hindlimb plantar stepping and step kinematics promoted by OEG transplantation in adult paraplegic rats.** *Brain*, **131**(1):264-76.
24. 2007 Petruska, J.C., Ichiyama, R.M., **Jindrlich, D.L.**, Crown, E.D., Tansey, K.E., Roy, R.R., Edgerton, V.R., Mendell, L.M. **Changes in Motoneuron Properties and Synaptic Inputs Related to Step Training Following Spinal Cord Transection in Rats.** *Journal of Neuroscience*. **27**(16):4460–4471.
25. 2007 **Jindrlich, D. L.**, Smith, N., Jespers, K., and Wilson, A.M. **Mechanics of cutting maneuvers by ostriches (*Struthio camelus*).** *Journal of Experimental Biology* **210**: 1378-1390.
26. 2006 Kuo, P-L., Lee, D.L., **Jindrlich, D. L.** and Dennerlein, J.T. **Finger joint coordination during tapping.** *Journal of Biomechanics*, **39**(16):2934-42.
27. 2006 Balakrishnan, A.D.* , **Jindrlich, D. L.** and Dennerlein, J.T. **Horizontal force components can reduce finger joint torques during tapping on a computer keyswitch.** *Human Factors*. **48**(1):121-9.
28. 2006 **Jindrlich, D. L.**, Besier, T. F. and Lloyd, D. G. **A hypothesis for the function of braking forces during running turns.** *Journal of Biomechanics*, **39**: 1611-1620.
29. 2004 **Jindrlich, D. L.**, Balakrishnan, A.D. and Dennerlein, J.T. **Keyswitch design and finger posture affect finger joint impedance during tapping on a computer keyswitch.** *Clinical Biomechanics*, **19**:600-608.
30. 2004 **Jindrlich, D. L.**, Balakrishnan, A.D. and Dennerlein, J.T. **Finger joint impedance during voluntary tapping on a computer keyswitch.** *Journal of Biomechanics*, **37**: 1589-1596.
31. 2003 **Jindrlich, D.L.**, Zhou, Y., Becker, T. and Dennerlein, J.T. **Non-linear viscoelastic models predict fingertip pulp force-displacement characteristics during voluntary tapping.** *Journal of Biomechanics*. **36**(4) 497-503.
32. 2002 **Jindrlich, D. L.** and Full, R. J. **Dynamic stabilization of rapid hexapedal locomotion.** *Journal of Experimental Biology*. **205**,2803-2823.
33. 1999 **Jindrlich, D.L.** and Full, R. J. **Many-legged maneuverability: dynamics of turning in hexapods.** *Journal of Experimental Biology*. **202**, 1603-1623.
34. 1999 Autumn, K., **Jindrlich, D.L.**, deNardo, D., and Mueller, R. **Locomotor performance at low temperature and the evolution of nocturnality in geckos.** *Evolution*. **53**(2), 580-599.

35. 1995 Full, R. J., Yamauchi, A. and **Jindrich, D. L.** **Maximum single leg force production: cockroaches righting on photoelastic gelatin.** *Journal of Experimental Biology*, **198**, 2441-2452.

Submitted Publications

2016 M. Qiao[†] and **D. L. Jindrich**. Functional Differences Among Human Leg Joints During Sagittal-Plane Running Maneuvers.

Publications in preparation

C.A. Lozano[#], D. Asakawa, K. Kahol, J.T. Dennerlein and **D. L. Jindrich** (*in preparation*). Muscle activity during multi-touch human-computer interaction.

D. L. Jindrich, B. Brown* and D. Protas* (*in preparation for Neuroscience Letters*). Selective Neurotransmitter antagonists affect motor evoked potentials in anesthetized rats.

C.A. Lozano[#], L. Doerfler*, S. Sidique* and **D. L. Jindrich** (*in preparation for Spinal Cord*). Towards a meta-analysis of spinal cord injury therapies.

D. L. Jindrich, T.A. Dawson*, W.L. Johnson[†], and V.R. Edgerton (*in preparation for Biology Letters*). Do rodents walk? D. Morrison* and **D. L. Jindrich**. (*in Preparation for Biology Letters*). Contributions of active muscles to joint impedance in rats.

D.L. Jindrich, J.A. Nessler, V.R. Edgerton (*in preparation for Journal of Neuroscience Methods*). **Objective methods for assessing rat locomotion kinematics.**

D.L. Jindrich, G. Courtine, H.L. McKay, R. Moseanko, T.J. Bernot, R.R. Roy, H. Zhong, J.J. Liu, H. Yang, L.A. Havton, M.H. Tuszynski, V.R. Edgerton. (*in preparation for Journal of Neuroscience*). **Recovery from spinal lesions in Rhesus monkeys part I: Motor control of grasping.**

D. L. Jindrich, R. J. Full (*in preparation for Journal of Comparative Physiology A*). **Control of leg movements in response to perturbations of rapid running in the cockroach, *Blaberus discoidalis*.**

*Mentored undergraduate. [†]Mentored graduate [#]Mentored post-doctoral

PRESENTATION ABSTRACTS

1. 2014 Deanna S. Asakawa, Jack T. Dennerlein and **Devin L. Jindrich**. Comparison of Task Completion Time, Finger Joint Angles, and the Pressure Applied by the Fingers for 7 Common Gestures on a Touchscreen Computing Device. World Congress of Biomechanics. (06-11 July, 2014. Boston, MA).
2. 2014 M. Qiao and **D.L. Jindrich**. The Functional Preference among the Joints in the Lower Extremities during Walking **Maneuvers**. World Congress of Biomechanics. (06-11 July, 2014. Boston, MA).
3. 2013 **Devin L. Jindrich**, Deanna S. Asakawa, Jong Hwa Lee, Cecil A. Lozano, Jack T. Dennerlein. Finger and arm control during interactions with multitouch devices. Society for Neuroscience Annual Meeting. (9-13 November, San Diego, CA).
4. 2013 Jong Hwa Lee, Deanna S. Asakawa, Cecil A. Lozano, Jack T. Dennerlein and **Devin L. Jindrich**. A data-driven optimization method to determine muscle-tendon paths of the index finger. American Society of Biomechanics. (04-07 September 2013, Omaha, NE).
5. 2013 Deanna S. Asakawa, Cecil Lozano, Jong Hwa Lee, Jack T. Dennerlein and **Devin L. Jindrich**. Joint angles of the fingers and thumb during 8 different gestures on a touchscreen computing device. American Society of Biomechanics. (04-07 September 2013, Omaha, NE).
6. 2013 M. Qiao and **D.L. Jindrich**. Using perturbations to understand the neuromechanical control of unsteady locomotion. Southern Biomedical Engineering Conference. (03-05 May, 2013, Miami, FL)
7. 2013 **D.L. Jindrich** and M. Qiao. Compensations for increased rotational inertia during human cutting turns. Society for Integrative and Comparative Biology. (03-07 January 2013, San Francisco, CA).
8. 2012 D.L. Jindrich. The LIMB Lab: comparative biomechanics and physiology at CSU San Marcos. *1st Annual Southwest Regional Joint DVM&DCB meeting of SICB* (California State University at San Bernardino (CSUSB) October 13th, 2012)
9. 2012 M. Qiao, **D.L. Jindrich**, and **M. Hughes**. Response to medio-lateral perturbations of human walking and running. *American Society of Biomechanics*. (August 15-18, 2012, Gainesville, FLA)
10. 2012 **D.L. Jindrich** and M. Qiao. Active control of unsteady locomotion. Dynamic Walking 2012. (21-24 May 2012, Pensacola, FLA).
11. 2011 M. Qiao and **D.L. Jindrich**. Effects of increasing inertia on sidestep cutting turns. *American Society of Biomechanics*. (10-12 August 2011).

12. 2011 K. Rich, J. Prince, M. Qiao and **D.L. Jindrlich**. An instrumented split-belt treadmill system using commercial parts. *American Society of Biomechanics*.(10-12 August 2011).
13. 2011 M. Qiao and **D.L. Jindrlich**. Comparing stride local stability during walking and running. *Society for Integrative and Comparative Biology Annual Meeting*.(03-07 January 2011).
14. 2010 M. Qiao and **D.L. Jindrlich**. Comparing dynamic stability during walking and running. *Society for Neuroscience Annual Meeting* (13-17 November 2010).
15. 2010 L.F. Friedli, E.S. Rosenzweig, **D. Jindrlich**, S.C. Strand, A.R. Ferguson, P. Musienko, R.R. Roy, H. Zhong, M.S. Beattie, J.C. Bresnahan, M.H. Tuszynski, V.R. Edgerton, G. Courtine. Non-human primates show extensive functional recovery compared to rats after partial spinal cord injuries. *Society for Neuroscience Annual Meeting* (13-17 November 2010).
16. 2010 D.C. Dunbar, E. Rejc, S. Zdunowski, A. Sotolongo, **D. Jindrlich**, R.R. Roy, H. Zhong, G. Courtine, J. Liu, T. Bernot, R. Moseanko, M. Tuszynski, V. R. Edgerton. Role of motor pool recruitment and coordination in food-grasping and spring-pull tasks by Rhesus monkeys after a spinal hemisection. *Society for Neuroscience Annual Meeting* (13-17 November 2010).
17. 2010 M. Qiao and **D. L. Jindrlich**. Whole-body local dynamic stability during walking and running. *American Society of Biomechanics* (10-13 August 2010), Providence, RI.
18. 2010 **D. L. Jindrlich** and M. Qiao. How do humans stabilize running? *Society for Integrative and Comparative Biology Annual Meeting* (3-7 January 2010), Seattle, WA.
19. 2010 D. Morrison and **D. L. Jindrlich**. Contributions of active muscles to joint impedance in rats. *Society for Integrative and Comparative Biology Annual Meeting* (3-7 January 2010), Seattle, WA.
20. 2010 T. Dawson and **D. L. Jindrlich**. Mechanical properties of rat hindlimbs during locomotion. *Society for Integrative and Comparative Biology Annual Meeting* (3-7 January 2010), Seattle, WA.
21. 2010 B. Brown and **D. L. Jindrlich**. Effects of increased rotational inertia on the mechanics of human cutting turns. *Society for Integrative and Comparative Biology Annual Meeting* (3-7 January 2010), Seattle, WA.
22. 2009 M. Qiao and **D. L. Jindrlich**. Do humans stabilize running like robots? *Society for Neuroscience Annual Meeting* (13-17 November 2009), Chicago, IL.
23. 2009 M. S. Joseph, Y. Faynerman, R. Cruz, S. Sasthri-rajaputrage, P. B. Duong, Y.-S. Lee, **D. L. Jindrlich**, H. V. Zhong, R. R. Roy, A. Silva, V. R. edgerton, N. J. K. Tillakaratne. Paw withdrawal learning is impaired in spinal cord transected adult transgenic mice that unable to phosphorylate cyclic AMP response element binding protein (CREB). *Society for Neuroscience Annual Meeting* (13-17 November 2009), Chicago, IL.
24. 2009 S. Sidique and **D. L. Jindrlich**. Towards a meta-analysis of spinal cord injury therapies. *Society for Neuroscience Annual Meeting* (13-17 November 2009), Chicago, IL.
25. 2009 **D. L. Jindrlich** and M. Qiao. Mechanical Contributions to Controlling Maneuvers During Bipedal Locomotion *Society for Neuroscience Annual Meeting* (13-17 November 2009), Chicago, IL.
26. 2009 M. Qiao and **D. L. Jindrlich**. Do humans stabilize running like robots? *American Society for Biomechanics annual meeting* (August 2009), College Park, PA.
27. 2009 **D. L. Jindrlich**, G. Courtine, J. J. Liu, H.L. McKay, R. Moseanko, T.J. Bernot, R.R. Roy, H. Zhong, M.H. Tuszynski, V.R. Edgerton. Gravity dominates unconstrained reaching movements by Rhesus monkeys. *American Society for Biomechanics annual meeting* (August 2009), College Park, PA.
28. 2008 **D.L. Jindrlich**, G. Courtine, J. J. Liu, H.L. McKay, R. Moseanko, T.J. Bernot, R.R. Roy, H. Zhong, M.H. Tuszynski, V.R. Dynamics of unconstrained three-dimensional reaching movements by Rhesus monkeys. *Society for Neuroscience Annual Meeting*, (November 15-19 2008), Washington, DC.
29. 2008 D Protas, B Brown, R Jung, and **D L Jindrlich**. Selective Neurotransmitter Blockers Affect Motor Evoked Potentials in Anesthetized Rats. *Society for Neuroscience Annual Meeting*, (November 15-19 2008), Washington, DC.
30. 2008 B. K. Hillen, **D. Jindrlich**, J. J. Abbas, R. Jung. Computational model of the effects of muscle activation profile on foot drag in the SCI rat. *Society for Neuroscience Annual Meeting*, (November 15-19 2008), Washington, DC.
31. 2008 A Takeoka, **DL Jindrlich**, H Zhong, MD Ziegler, C Muñoz-Quiles, A Ramón-Cueto, RR Roy, VR Edgerton, PE Phelps. Evidence for functional reconnectivity of descending motor pathways in adult rats after complete spinal cord transection and olfactory ensheathing glia transplantation. *Society for Neuroscience Annual Meeting*, (November 15-19 2008), Washington, DC.
32. 2008 B. Hillen, J.J. Abbas, **D.L. Jindrlich** and R. Jung. Effects of muscle strength and activation profile on foot drag in a simulated SCI rat. *Organization for Computational Neurosciences Annual Meeting*, (July 2008), Portland, OR.
33. 2007 **Jindrlich, D.L.**. Objective methods for assessing rat locomotor kinematics. *Society for Neuroscience Annual Meeting*, (November 3-7 2007), San Diego, CA.

34. 2007 E. S. Rosenzweig, M. D. Culbertson, J. H. Brock, L. Lu, T. Bernot, R. Moseanko, G. Courtine, **D. L. Jindrich**, J. J. Liu, V. R. Edgerton, L. A. Havton, M. H. Tuszynski. Spontaneous plasticity of corticospinal projections after primate spinal cord injury. *Society for Neuroscience Annual Meeting*, (November 3-7 2007), San Diego, CA.
35. 2007 D. C. Dunbar, **D. Jindrich**, N. Hamouda, R. Roy, H. Zhong, G. Courtine, J. Liu, T. Bernot, R. Moseanko, M. Tuszynski, V. Edgerton. Manual prehension strategies in rhesus monkeys before and after cervical hemisection. *Society for Neuroscience Annual Meeting*, (November 3-7 2007), San Diego, CA.
36. 2007 **Jindrich, D.L.** Mechanics of Bipedal Running Turns. *American Society of Biomechanics Annual Meeting*, (August 2007), Stanford, CA.
37. 2006 Jafari, R., **Jindrich, D.L.**, Edgerton, V.R., Sarrafzadeh, M. CMAS: Clinical Movement Assessment System for Neuromotor Disorders. *IEEE Biomedical Circuits and Systems Conference (BioCAS)*, (November-December 2006), London, UK.
38. 2006 Otoshi, C.K., **Jindrich, D.L.**, Wei, R.Y., Fong, A.J. Cai, L.L., Ali, N.J., Zhong, H. Tillakaratne, N.J.K., Roy, R.R., Edgerton, V.R. Application of the Horridge Paradigm in the Adult Spinal Mouse. *Society for Neuroscience Annual Meeting (October 14-18, 2006)*.
39. 2006 **Jindrich, D.L.**, Courtine, G. McKay, H.L., Bernot, T., Moseanko, R., Roy, R.R., Zhong, H., Rosenzweig, E., Havton, L.A., Tuszynski, M.H., Edgerton, V.R. Effects of cervical hemisection on locomotion and prehension in Rhesus monkeys. *Society for Neuroscience Annual Meeting (October 14-18, 2006)*.
40. 2006 Jafari, R., **Jindrich, D.L.**, Edgerton, V.R., Sarrafzadeh, M. Quantitative Assessment of Neuromotor Disorders Using a Wearable Sensor Network. *Society for Neuroscience Annual Meeting (October 14-18, 2006)*.
41. 2006 Johnson, W.L., **Jindrich, D.L.**, Roy, R.R., Edgerton, V.R. Muscle origin and insertion coordinates relative to bone landmarks in the rat hindlimb – toward a musculoskeletal model. *Society for Neuroscience Annual Meeting (October 14-18, 2006)*.
42. 2006 Jafari, R., **Jindrich, D.L.**, Edgerton, V.R., Sarrafzadeh, M. CMAS: Clinical Movement Assessment System for Neuromotor Disorders. *Tenth International Symposium on Wearable Computers (October 11-14, 2006)*.
43. 2005 **Jindrich, D.L.**, Courtine, G. McKay, H.L., Betts, S.L., Bernot, T., Roy, R.R., Zhong, H., Liu, J.J. Gupta, R.K. Yang, H., Havton, L.A., Tuszynski, M.H., Edgerton, V.R. **Effects of cervical hemisection on prehension in Rhesus monkeys.** *Society for Neuroscience 2005 meeting* (November 2005).
44. 2003 **Jindrich, D.L.**, Kuo, P-L, Balakrishnan, A.D. and Dennerlein, J.T. (2003) **Keyswitch design and finger posture affect joint impedance when tapping on computer keyswitches.** *Proc. Amer. Soc. Biomech.* 243.
45. 2002 **Jindrich, D.L.** (2002) **Dynamic stabilization of rapid hexapodal locomotion.** *Proc. Fourth World Congress of Biomechanics.* 878.
46. 2002 **Jindrich, D.L.** and Dennerlein, J.T. (2002) **Impedance models of finger joints during typing.** *Proc. Fourth World Congress of Biomechanics.* 5263.
47. 2002 **Jindrich, D.L.**, Becker, T. and Dennerlein, J.T. (2002) **Fingertip pulp mechanics during voluntary tapping.** *Proc. Fourth World Congress of Biomechanics.* 866.
48. 2000 **Jindrich, D. L.** and Full, R. J. (2000) **Dynamic stabilization of rapid hexapodal locomotion.** *Am. Zool.* 40(6), 1077-1077.
49. 1999 **Jindrich, D. L.** and Full, R. J. (1999) **Kinematic variability during constant average speed running in cockroaches.** *Am. Zool.* 38:81A.
50. 1998 **Jindrich, D. L.** and Full, R. J. (1998) **Requirements for self-stabilizing running in 3D hexapods.** *Am. Zool.* 37:176A.
51. 1996 Full, R.J. and **Jindrich, D. L.** (1996) **AAPE: 3D data acquisition, analysis, presentation and exchange.** *ACM SIGGRAPH 96 Visual Proceedings.* 108.
52. 1995 **Jindrich, D. L.** and Full, R. J. (1995) **Mechanics of turning in hexapods.** *Proc. Amer. Soc. Biomech.* 19: 105-106.
53. 1995 **Jindrich, D. L.** and Full, R. J. (1995) **Dynamics of turning in a running cockroach.** *Physiol. Zool.* 68: 57.
54. 1994 **Jindrich, D.L.** and Full, R.J. (1994). **Turning behavior of cockroaches.** *Amer. Zool.* 34: 38A.

INVITED PRESENTATIONS

1. **2015 Jindrich, D.L.** Comparative studies to understand body- and joint- level mechanics and control of unsteady locomotion. Dynamic Walking. (20-24 July, 2015. Columbus, OH).
2. **2014 Jindrich, D.L.** and Qiao, M. Terrestrial Dynamics and Control of Unsteady Locomotion. World Congress of Biomechanics. (06-11 July, 2014. Boston, MA).

3. 2014 **Jindrich, D.L.** and Qiao, M. Compensations during unsteady locomotion. Society for Integrative and Comparative Biology Annual Meeting, Terrestrial Locomotion Symposium. (03-07 January 2014. Austin, TX).
4. 2013 **Jindrich, D.L.** The LIMB Lab at CSUSM: Comparative Neuromechanics with Applications to Ergonomics and Rehabilitation. *CSU San Marcos presentation to KPBS* (18 April 2013)
5. 2013 **Jindrich, D.L.** From invertebrates to iPads: applying basic neuromechanics research to biomedicine and public health. *San Diego State University* (11 March 2013)
6. 2012 **Jindrich, D.L.** From invertebrates to iPads: applying basic neuromechanics research to biomedicine and public health. *U.C. Irvine Ecology and Evolutionary Biology Department Seminar* (28 September 2012)
7. 2012 **Jindrich, D.L.** Are constraints the mother of invention? Northeastern University (Boston, MA 07 June 2012)
8. 2011 **Jindrich, D.L. The LIMB Lab: Comparative Neuromechanics, with Applications to Ergonomics and Rehabilitation.** Northern Arizona University (Flagstaff, AZ, October 2011)
9. 2011 **Jindrich, D.L. Task-Level Control of Unsteady Locomotion in Humans.** Progress in Motor Control VIII (Cincinnati, OH, July 2011).
10. 2008 **Jindrich, D. L. Biomechanics and Motor Control of Unsteady Locomotion, with Applications.** Johns Hopkins University. (Baltimore, MD. 19 November 2008).
11. 2006 **Jindrich, D. L. Functional recovery following spinal cord injury in Rhesus Monkeys.** UCLA Neural Repair Seminar Series. (Los Angeles, CA. 28 April 2006).
12. 2005 **Jindrich, D. L. Strategies for restoring function following spinal cord injury.** Institute for Neuromorphic Engineering Workshop. (Zurich, Switzerland, 21-25 August 2005).
13. 2005 **Jindrich, D. L. Unsteady Locomotion.** Society for Experimental Biology Annual Meeting Symposium. (Barcelona, Spain, 11-15 July 2005).
14. 2004 **Jindrich, D. L. Stability and maneuverability of locomotion, with applications.** Harvey Mudd College Biology Department seminar. (Claremont, CA., 17 November 2004).
15. 2004 **Jindrich, D. L. Stability and maneuverability.** University of Southern California seminar series. (Los Angeles, CA., 7,11 October 2004).
16. 2004 **Jindrich, D. L. Unsteady locomotion in bipeds and polypeds.** Royal Veterinary College seminar series. (Brookman's Park, U.K. 19 July 2004).
17. 2003 **Jindrich, D. L. Running Roaches and Repetitive Motions: Studying the Mechanics of Movement.** Stanford University Biomechanical Engineering Seminar. (Palo Alto, CA. 02 May 2003).
18. 2002 **Jindrich, D. L. Stability, maneuverability, and control of rapid cockroach locomotion.** M.I.T. Computational Motor Control seminar. (Boston, MA. 28 August 2002).
19. 2002 **Jindrich, D. L. Stability, maneuverability, and control of rapid cockroach locomotion.** Harvard School of Public Health Work in Progress seminar. (Boston, MA. 05 March 2002).
20. 1998 **Jindrich, D. L. and Full, R. J. Stability and maneuverability: theoretical models and empirical correlates.** 1998 DARPA Michigan Site Visit. (Ann Arbor, MI. 9 December 1998).
21. 1997 **Jindrich, D.L. Control strategies for dynamic locomotion.** Workshop on Modeling and Simulation of Biomechanical Systems. (Bielefeld, Germany. 5-6 June, 1997).
22. 1997 **Jindrich, D. L. Preflexes and stability during rapid locomotion.** Office of Naval Research Legged Locomotion Workshop. (Cambridge, MA. 28-31 May, 1997).
23. 1997 **Jindrich, D.L. Using internet information servers to provide resources for research, instruction, and community outreach programs.** Colloquium on Using the Internet for Instruction and Outreach. (Berkeley, CA. 1997).
24. 1996 **Jindrich, D. L. The AAPE center at U. C. Berkeley: using data acquisition, analysis, presentation, and exchange to address biological complexity.** ACM SIGGRAPH. (New Orleans, LA, 1996).
25. 1995 **Jindrich, D. L. Locomotor behavior of the cockroach: mechanics and nervous organization.** Santa Fe Institute's Complex Systems Summer Program. (Santa Fe, NM. 1995).

GRANTS AND CONTRACTS

A. Current (funded)

TITLE: HCC Medium: A toolkit to evaluate the effect of multitouch interaction on musculoskeletal system and design safe multitouch systems

SOURCE: NSF (IIS/HCC)

PERIOD: 2010-2016

STATUS: Funded: NSF 0964220

TYPE: MEDIUM **BUDGET:** \$1,200,000

ROLE: PI

DESCRIPTION: Proposal to develop a toolkit to aid in the design of multitouch interfaces to prevent injuries.

B. Submitted (pending)

C. In Revision

TITLE: Neuromotor control of unsteady locomotion
SOURCE: NIH (NINDS) **PERIOD:** 2013-2016 **STATUS:** Submitted 06/2013
TYPE: R15 **BUDGET:** \$370,000 **ROLE:** PI
DESCRIPTION: Proposal to measure and model stability of human walking and running.

TITLE: A Biomechanics-Based Neuoprosthetic Controller for Locomotion
SOURCE: NIH (NINDS) **PERIOD:** TBD **STATUS:** Submitted to NIH, Not Funded.
TYPE: R21 **BUDGET:** \$275,000 **ROLE:** PI
DESCRIPTION: Proposal to develop a neuroprosthetic control system for locomotion that takes advantage of the energy-saving and intrinsically-stabilizing mechanical mechanisms used by animals during locomotion.

TITLE: Using Ultrasound to Stimulate Spinal and Peripheral Neurons
SOURCE: NIH (NINDS), NSF (RAPD) **PERIOD:** TBD **STATUS:** Submitted to DoD CDMRP, Selected as Alternate
TYPE: HDA **BUDGET:** \$136,000 **ROLE:** PI
DESCRIPTION: Proposal to evaluate the potential for non-invasive ultrasound to modulate spinal and peripheral neural circuitry.

TITLE: A Meta-Analysis of Spinal Cord Injury Therapies
SOURCE: NSF (RAPD), Neilsen Foundation, CDRF **PERIOD:** TBD **STATUS:** Submitted to DoD CDMRP, Not Funded
TYPE: HDA **BUDGET:** \$136,000 **ROLE:** PI
DESCRIPTION: Proposal to perform a meta-analysis of treatments for spinal cord injury.

D. In Preparation

TITLE: Morphological and Physiological Interactions Underlying Unsteady Locomotion.
SOURCE: NSF (IOS) **PERIOD:** TBD **STATUS:** In Preparation.
TYPE: TBD **BUDGET:** TBD **ROLE:** PI
DESCRIPTION: Proposal to better understand the interactions among size, phylogeny, and morphology that underlie the performance and control of stability and maneuverability.

E. Completed

TITLE: Plasticity and Regeneration in the Primate Spinal Cord
SOURCE: National Institutes of Health **PERIOD:** 2006-2011 **STATUS:** Approved
TYPE: R01 **ROLE:** Researcher
DESCRIPTION: Continuation of a project to understand the functional and anatomical consequences of spinal cord injury in primates, and evaluate therapeutic strategies. I managed the UCLA contribution of this successful collaborative proposal between UCLA, UCSD, and UCD.

TITLE: Combined OEG transplantation and step training promote regeneration in adult SCI
SOURCE: National Institutes of Health **PERIOD:** 2006-2010 **STATUS:** Approved
TYPE: R01 **ROLE:** Researcher
DESCRIPTION: Proposal to evaluate the effectiveness of olfactory ensheathing glial cells and step training in improving locomotion following spinal cord injury. This project will also use neurophysiological studies to investigate the mechanisms of improved function following treatment with OEG cells. I contributed to the overall design of the study, oversaw the functional analysis of the data, and contributed to writing the proposal.

SOURCE: National Science Foundation **PERIOD:** 1996-1998 **STATUS:** Completed
TYPE: Graduate Research Fellowship **COSTS:** Stipend: \$15,000 / year
DESCRIPTION: Fellowship granted for graduate study in Integrative Biology at the University of California, Berkeley.

STUDENTS SUPERVISED

A. Graduate

Mu Qiao	Ph.D.	ASU Kinesiology	Dissertation Advisor
Jong-Hwa Lee	Ph.D.	ASU Mechanical Engineering	Dissertation Advisor
Mark Hughes	M.S.	ASU Mechanical Engineering	Thesis Advisor
Bryan Morrison	Ph.D.	ASU Kinesiology	Committee Member
Cecile Lozano	Ph.D.	ASU Kinesiology	Committee Member
Daisuke Shibata	Ph.D.	ASU Kinesiology	Committee Member
Wanyue Wang	Ph.D.	ASU Kinesiology	Committee Member
Qiushi Fu	Ph.D.	ASU Kinesiology	Committee Member
Mallika Fairchild	Ph.D.	ASU Bioengineering	Committee Member
Brian Hillen	Ph.D.	ASU Bioengineering	Committee Member
Charla Lindley	Ph.D.	ASU Bioengineering	Committee Member
James Waters	Ph.D.	ASU SoLS	Committee Member
Anne Curzon	M.A.	ASU Kinesiology	Committee Member
Giridar Hegde	M.A.	ASU Kinesiology	Committee Member

B. Undergraduate

Adam Schmalz	CSUSM		
Alejah Tabulah	CSUSM	Severne Herida	CSUSM
Amy Clark	CSUSM	Ryan Martineau	CSUSM
Marc Surdyka	ASU	Rachelle Holt	ASU
Kathryn Cotten	ASU	Brett Hughes	ASU
Danielle Protas	ASU	Brianna Angeleri	ASU
Elizabeth Drummond	ASU	Lacey Doerfler	ASU
Brian Brown	ASU	Nikki Castel	ASU
David Morrison	ASU	Tasha Cheshko	ASU
Tricia Dawson	ASU	Tim Hinton	ASU
Alex Wilson	ASU	Robert Wei	UCLA
Sumaya Sidique	ASU	Ravi Gupta	UCLA
Ara Austin	ASU	Kathleen (Kat) Yaphockun	UCLA
Zachary Gilbert	ASU	Aristakes Mnatsakanyan	UCLA
Josh Pfent	ASU	Aruna Balakrishnan	Harvard

PATENTS

“Method and Apparatus for Quantitative Assessment of Neuromotor Disorders.” M. Sarrafzadeh, R. Jafari, V.R. Edgerton, and D.L. Jindrich, inventors. USPTO Application # 20100113979.

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Articles about my research have appeared in *Science*, *Scientific American*, *LiveScience*, *Science et Vie*, *Fox News*, and *Wissenschaft-online* among others.