

BIOGRAPHICAL SKETCH

Roy E. Ritzmann - Professor

BIRTHDATE: November 24, 1947

PLACE OF BIRTH: Chicago, Illinois

EDUCATION:

B.A., 1969, Zoology, University of Iowa, Iowa City, Iowa

Ph.D., 1974, Biology, University of Virginia, Charlottesville, Virginia

Post-doc., 1974 -77, Neurophysiology, Cornell University, Ithaca, New York

MAJOR RESEARCH INTEREST: Behavioral Neurobiology

EMPLOYMENT:

Postdoctoral Research Assistant in laboratory of J.M. Camhi, 1974 - 1977

NIH Postdoctoral Fellow, 1976 - 1977

Assistant Professor, Department of Biology, Case Western Reserve University (CWRU), Cleveland, Ohio,
1977 - 1983

Associate Professor, Department of Biology, CWRU, Cleveland, Ohio, 1983 - 1992

Adjunct Associate Professor, Department of Neuroscience, CWRU, Cleveland, Ohio, 1989 - 1992

Full Professor, Department of Biology, CWRU, Cleveland, Ohio, 1992 - Present

Adjunct Full Professor, Department of Neuroscience, CWRU, Cleveland, Ohio, 1992 – Present

Director of NSF sponsored IGERT Graduate Training Program in Neuromechanics at CWRU, 1999 – 2006

Directed task force for adaption of SAGES undergraduate curriculum reform that replaced standard general education requirement with seminar based program throughout undergraduate curriculum. Plan adapted by Case faculty in Spring 2004, 2003 - 2004.

HONORS

Recipient of NIH Postdoctoral Fellowship, 9/75

Grass Traveling Lecturer, Marshall University, 5/91

Diekhoff award for Graduate Teaching, 5/97

Robot III: Finalist for Discover Magazine's 9th Annual Technology Award, 6/98

Elected Fellow of AAAS, 9/00

Invited to give Keynote Address at Singapore Robot Olympic Games (with Roger D. Quinn), 5/01

Winner of Best Video Award – 2005 IEEE International Conference on Robotics and Automation

Invited to give Kenneth Roeder Memorial Lecture, 4/06/2006, Tufts University, Medford, MA.

Poster developed by students in Biorobotics Team Research Course won 1st place in Natural Sciences Poster Competition of 2006 Case SOURCES Undergraduate Symposium.

Invited to give Dupont Lectures, 4/2008, University of Arizona, Tucson, AZ.

Invited to join Editorial Advisory Board for the Journal of Comparative Physiology, A., 7/29/2008

Invited to join the “Virtual Faculty” of the "Cognitive Interaction Technology" (CITEC) based in Bielefeld, Germany 01/28/2009.

Nominated for Wittke award for Undergraduate Teaching, 5/2009

Finalist for Diekhoff award for Graduate Mentorship 4/2010

PROFESSIONAL SOCIETIES:

Society for Neurosciences, 1978 - Present

International Society for Neuroethology, 1985 - Present

AAAS, 1989 - Present

PROFESSIONAL SERVICE:

Panel Member, NSF Instrumentation and Instrument Development Panel (1988-91)

Panel Member, NSF Undergraduate Laboratory Panel (1991)

NIH Site Visit Team - San Juan, PR. (1992)

Ad hoc reviewer for NSF and USDA

Referee for J. Comp. Physiol, J. Exp. Biol., J. Neurobiol., J. Insect Phys. J. Neurophys.

Lead Organizer 4th meeting of Adaptive Motion of Animals and Machines, 2008 held at Case Western Reserve University, Cleveland, OH June 1-6, 2008.

Member of Editorial Advisory Board of the Journal of Comparative Physiology A. (2008-Present)

STUDENTS TRAINED:

Name	Predoc/ Postdoc	Training Period	Grad. Degree	Year Granted	Current Position
<u>Past Graduate Students</u>					
Tobias, M.L.	Pre	78-83	Ph.D.	1983	Sr. Research Sci, Columbia Univ.
Murrain, M.P.	Pre	81-87	Ph.D.	1987	Owens Computer Network Co.
Dieckman, L.J.	Pre	81-85	M.S.	1985	unknown
Nye, S.W.	Pre	88-91	M.S.	1991	Physician
Casagrand, J.L.	Pre	85-91	Ph.D.	1991	Out of science
Songhai Chai	Pre	90- 95	Ph.D.	1995	Res. Assoc. Cleveland State Univ.
Dan Greenblatt	Pre	99	M.S.	2000	Physician
Tryba, Andrew	Pre	93-00	Ph.D.	1999	Asst. Prof, Medical College of Wisconsin, Physiology Dept.
Paul Schaefer	Pre	93-01	Ph.D.	2001	Physician
Blythe Alexander	Pre	02 - 04	M.S.	2004	Graduate School – Univ. of Kansas
Laiyong Mu	Pre	01-07	Ph.D.	2007	Postdoc with N. Strausfeld, U. Arizona
Cynthia Harley	Pre	03 -09	Ph.D.	2009	Postdoc with D. Wagenaar; Cal Tech
<u>Past Postdoctoral</u>					
James Watson	Post	91- 00	Ph.D.	1989	H.S. Teacher – Cleveland Schools
Angela Ridgel	Post	01-06	Ph.D.	2000	Asst. Prof., Kent State University
<u>Current Post-Graduate Students</u>					
Nicholas Kathman	Pre	06 -			
Peiyuan Guo	Pre	08 -			
Amy Brown	MS	09 -			
<u>Current Postdoctoral</u>					
John Bender	Post	007 -	Ph.D.	2007	
<u>Undergraduate Researchers</u>					
Amy Csorba	Undgr				
Sue Hudson	Undgr				

Veruni Kondagunta	Undgr	
Paul Schaefer	Undgr	
Timothy Tufel	Undgr	
David Gondenswager	Undgr	
J. Mark Saunders	Undgr	
Abel Donka	Undgr	
Ryan Edel	Undgr	
David Mills	Undgr	1999 – 2000
Rob Kollmorgen	Undgr	1999 – 2000
Katherine Otto	Undgr	2000, 2001
Cynthia Rice	Undgr	2001
Lyndsey Benson	Undgr	2002
Dave Howard	Undgr	2003, 2004-5
Jeff Archinal	Undgr	2003 – 2004
Katherine Moore	Undgr	2004
Yidi Xu	Undgr	2005
Anna Booth	Undgr	2005
Genevieve Criss	Undgr	2005 – 2006
Robert Pollack	Undgr	2006
Brittany English	Undgr	2006-2007
Elaine Simpson	Undgr	2007-2010
Solomon J. Awe	Undgr	2008
Nicholas Korsantia	Undgr	2009
Brian R. Tietz	Undgr	2009-2011
Audra Horomanski	Undgr	2010-2011
Claudia Nieuwoudt	Undgr	2011- Present
Andrea Sterenstein	Undgr	2011- Present
Kimberly Schraitle	Undgr	2011- Present

Pre-college Interns

Nick Celeste	Gilmour Acad.
Brad Gazdag	Gilmour Acad.

COURSES TAUGHT

Human Physiology
Invertebrate Biology
Neurobiology Laboratory
Neurobiology of Behavior
Organismal Biology
Organisms and Ecosystems
Physiology Laboratory
Biorobotics Team Research
Backyard Behavior (Capstone Experience)

CURRENT RESEARCH SUPPORT:

NSF Grant IOS-1120305 “Processing in the Insect Brain Leading to Context Dependent Turning”

08/2011 – 08/2015

PI/PD – R.E. Ritzmann

AFOSR Grant FA9550-10-1-0054 “Hierarchical Control of Maneuverability in Walking and Flying Insects: A Neurobiological and Hardware Model Approach”

03/01/2010 – 2/28/2014

PI/PD – R. E. Ritzmann

DARPA/DSO Contract W91CRB-11-1-0003 “Biologically-Based Network Controller for Dynamic Legged Locomotion”

1/26/2011 – 1/25/2015

PI/PD – R.D. Quinn

PUBLICATIONS over last 10 years (out of 89 total peer reviewed publications):

1. Schaefer, P.L. and R.E. Ritzmann (2001) Descending influences on escape behavior and motor pattern in the cockroach. *J. Neurobiol.* **49**:9-28.
2. Kaliyamoorthy, S., Zill, S.N., Quinn, R.D., Ritzmann, R.E., Choi, J. (2001) Finite element analysis of strains in a *Blaberus* cockroach leg during climbing, Int. Conf. on Intelligent Robots and Systems (IROS), Maui, HI. pp. 833-838.
3. Birch, M.C., Quinn, R.D., Hahm, G., Phillips, S.M., Drennan, B., Fife, A., Beer, R.D., Yu, X., Garverick, S.L., Laksanacharoen, S., Pollack, A.J., Ritzmann, R.E., (2001) A Miniature Hybrid Robot Propelled by Legs, Int. Conf. on Intelligent Robots and Systems (IROS), Maui, HI. pp. 845-851.
4. Vaidyanathan, R., Quinn, R.D., Ritzmann, R.E., Prince, T.S., (2001) An Insect Inspired Endgame Targeting Reflex for Autonomous Munitions. Int. Conf. on Intelligent Robots and Systems. Int. Conf. on Intelligent Robots and Systems (IROS), Maui, HI. pp. 1609-1615.
5. Quinn, R. D. Nelson, G.M., Bachmann, R.J., Kingsley, D.A., Offi, J. and Ritzmann, R. E. (2001). Insect Designs for Improved Robot Mobility. In Proc. of Climbing and Walking Robots (CLAWAR01) Conference, Karlsruhe, Germany.

6. Quinn, R.D., Nelson, G.M., Bachmann, R.J., and Ritzmann, R.E. (2001) Toward Mission Capable Legged Robots through Biological Inspiration. *Autonomous Robots*, 11 (3), 215-220.
7. Birch, M.C., Quinn, R.D., Hahm, G., Phillips, S.M., Drennan, B.T., Fife, A.J., Beer, R.D., Yu, X., Garverick, G., Laksanacharoen, S., Pollack, A.J., Ritzmann, R.E., (2002) "A Miniature Hybrid Robot Propelled by Legs," *IEEE Robotic & Automation Magazine*, Vol. 10, Dec. 2002.
8. Fife, A., Laksanacharoen, S., Quinn, R.D., Beer, R.D. and Ritzmann, R.E. (2002). The evolution of neural network controllers for the targeted swing of a cockroach-like robot. In Proceedings of the IEEE World Congress on Computational Intelligence, Honolulu, HI, May 12-17, 2002.
9. Quinn, R.D., Kingsley, D.A., Offi, J. and Ritzmann, R.E., (2002), Improved Mobility Through Abstracted Biological Principles, IEEE Int. Conf. On Intelligent Robots and Systems (IROS'02), Lausanne, Switzerland.
10. Watson, J.T, Ritzmann, R.E., Zill, S.N. and Pollack, A.J. (2002) Control of Obstacle Climbing in the Cockroach, *Blaberus discoidalis* I. Kinematics. *J.Comp. Physiol. A*. **188**:39-53.
11. Watson, J.T, Ritzmann, R.E., and Pollack, A.J. (2002) Control of Obstacle Climbing in the Cockroach, *Blaberus discoidalis* II. Motor Activities Associated with Joint Movement. *J. Comp. Physiol. A*. **188**:55-69.
12. Birch, M.C., Quinn, R.D., Hahm, G., Phillips, S.M., Drennan, B.T., Fife, A.J., Beer, R.D., Yu, X.Y., Garverick, S.L., Laksanacharoen, S., Pollack, A.J. and Ritzmann, R.E. (2002). Cricket- based robots. *IEEE Robotics and Automation Magazine* **9**(4) pp. 20-30.
13. Quinn, R.D., Nelson, G.M., Ritzmann, R.E., Bachmann, R.J., Kingsley, D.A., Offi, J.T. and Allen, T.J. (2003), Parallel Strategies For Implementing Biological Principles Into Mobile Robots. *Int. Journal of Robotics Research* **22**: 169-186.
14. Ridgel, A.L., R.E. Ritzmann and P.L. Schaefer (2003) Effects of aging on behavior and leg kinematics during locomotion in two species of cockroach. *J. exp. Biol.* **206**(24):4453-4465.
15. Boggess, M.J., Schroer, R.T., Quinn, R.D., Ritzmann, R.E. (2004) Mechanized Cockroach Footpaths Enable Cockroach-like Mobility, IEEE International Conference on Robotics and Automation (ICRA'04), New Orleans.
16. Ritzmann, R.E., R.D. Quinn and M.S. Fischer (2004) Convergent Evolution and Locomotion through Complex Terrain by Insects, Vertebrates and Robots. *Arth. Struct. Dev.* **33**(3):361-379.
17. Ritzmann, R.E., R.D. Quinn and S. Gorb (2004) Arthropod locomotion systems: from biological materials and systems to robotics - Editorial. *Arth. Struct. Dev.* **33**(3):183-185.
18. Schroer, R.T, Boggess, M.J., Bachmann, R.J., Quinn, R.D., and Ritzmann, R.E. (2004) Comparing Cockroach and Whegs Robot Body Motions, IEEE International Conference on Robotics and Automation (ICRA'04), New Orleans.
19. Wei, T.E., Quinn, R.D., and Ritzmann, R.E. (2004) "A CLAWAR That Benefits From Abstracted Cockroach Locomotion Principles," In Proc. of Climbing and Walking Robots Conference (CLAWAR04), Madrid.
20. Daltorio, K.A., Horchler, A.D., Gorb, S., Ritzmann, R.E., Quinn, R.D. (2005) A small wall walking robot with compliant adhesive feet, 2005 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS05), Edmonton, Canada.

21. Lewinger, W.A., C.M. Harley, R.E. Ritzmann, M.S. Branicky, and R.D. Quinn. "Insect-like Antennal Sensing for Climbing and Tunneling Behavior in a Biologically-inspired Mobile Robot," IEEE International Conference on Robotics and Automation (ICRA'05) Proceedings, Barcelona, Spain, April 18-22, 2005.
22. Mu, L., R.E. Ritzmann (2005) Kinematics and motor activity during tethered walking and turning in the cockroach, *Blaberus discoidalis*. *J. Comp. Physiol. A*. **191**:1037-1054.
23. Ridgel, A.L. and R.E. Ritzmann (2005) Insights into age-related locomotor declines from studies of insects. *Aging Res Rev* **4**:23-39.
24. Ridgel, A.L. and R.E. Ritzmann (2005) Effects of neck and circumoesophageal connective lesions on posture and locomotion in the cockroach *J. Comp. Physiol. A*. **191**:559-73.
25. Ritzmann, R.E., A.J. Pollack, J. Archinal, A.L. Ridgel, and R.D. Quinn, (2005) Descending Control of Body Attitude in the Cockroach, *Blaberus discoidalis* and Its Role in Incline Climbing. *J. Comp. Physiol. A*. **191**:253-264.
26. Kingsley, D.A., Quinn, R.D., Ritzmann, R.E. (2006) A cockroach inspired robot with artificial muscles, IEEE IROS'06, Beijing
27. Daltorio, K.A., Gorb, S., Peressadko, A., Horchler, A.D., Wei, T.E., Ritzmann, R.E., Quinn, R.D. "Micro-structured polymer adhesive feet for robot climbing." MRS (Materials Research Society) Bulletin. vol. 32, no. 6, pp. 504-508, June 2007.
28. Daltorio, K.A., T.E. Wei, S.N. Gorb, R.E. Ritzmann, R.D. Quinn. (2007) "Passive Foot Design and Contact Area Analysis for Climbing Mini-Whegs™." International Conference on Robotics and Automation (ICRA '07). Rome, Italy. April 10-14, 2007.
29. Ridgel, A.L., Alexander, B.E. and Ritzmann, R.E. (2007) Descending control of turning behavior in the cockroach, *Blaberus discoidalis*. *J. Comp. Physiol. A*. **193**:385–402.
30. Rutter, B.L., Mu, L., Ritzmann, R.E., Quinn, R.D. (2007) Transforming Insect Electromyograms into Pneumatic Muscle Control. International Conference on Robotics and Automation (ICRA '07). Rome, Italy. April 10-14, 2007.
31. Ritzmann, R.E., Büschges, A. (2007) Adaptive Motor Behavior in Insects. *Curr. Opin. Neurobiol.* **17**:629-636.
32. Daltorio, K.A., T. Witushynsky, G. Wile, L. Palmer, A. Malek, M.R. Ahmad, L. Southard, S.N. Gorb, R.E. Ritzmann, R.D. Quinn (2008) A Body Joint Improves Vertical to Horizontal Transitions of a Wall-Climbing Robot. International Conference on Robotics and Automation (ICRA'08), Pasadena. In press.
33. Mu, L., R.E. Ritzmann (2008) Interaction between descending input and local thoracic reflexes for joint coordination in cockroach turning: I. Descending influence on thoracic sensory reflexes. *J. Comp. Physiol. A* **194**:283-298.
34. Mu, L., R.E. Ritzmann (2008) Interaction between descending input and local thoracic reflexes for joint coordination in cockroach turning: II. Comparative studies on tethered turning and searching. *J. Comp. Physiol. A* **194**:299-312.
35. Ritzmann R.E., Ridgel A, Pollack AJ: (2008) Multi-unit recording of antennal mechano-sensitive units in the central complex of the cockroach, *Blaberus discoidalis*. *J. Comp. Physiol. A* **194**:341–360.

36. Wile, G.D. Daltorio, K.A., Diller, E.D., Palmer, L.R., Gorb, S.N., Ritzmann, R.E. and Quinn, R.D. (2008) Screenbot: Walking inverted using distributed inward gripping, Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'08), Nice, France.
37. Daltorio, K.A. Wei, T.E., Horchler, A.D., Southard, L., Wile, G.D., Gorb, S.N., Ritzmann, R.E., Quinn, R.D.. (2009) “Mini-Whegs™ Climbs Steep Surfaces Using Insect-Inspired Attachment Mechanisms” *International Journal of Robotics Research* Vol. 28, No. 2, February 2009, pp. 285–302.
38. Harley, C.M., English, B. and Ritzmann, R.E. (2009) Characterization of obstacle negotiation behaviors in the cockroach, *Blaberus discoidalis*. *J. Exp. Biol.* **212**:1463-1476.
39. Lewinger, W.A., Harley, C.M., Watson, M.S., Branicky, M.S., Ritzmann, R.E. and Quinn, R.D. (2009) “Animal-inspired sensing for autonomously climbing or avoiding obstacles,” in Applied Bionics and Biomechanics, Vol. 6, No. 1, pp. 3-21, 2009.
40. Ritzmann, R.E. and Zill, S.N. (2009) “Walking and Jumping” in Encyclopedia of Insects 2nd edition. edited by V.H. Rush and R.T. Carde, Academic Press. 1044 - 1048.
41. Ritzmann, R.E. (2010) Visuomotor Control: Not So Simple Insect Locomotion. *Curr. Biol.* **20**:R18-R19.
42. Ritzmann, R.E. and Bender, J.A. (2010) Neural Basis for Flight and Walking in Insects. In Encyclopedia of Animal Behavior, M. Breed and J. Moore eds. Academic Press, Oxford.
43. Bender, J.A., A.J. Pollack and R.E. Ritzmann (2010) Neural activity in the central complex of the insect brain is linked to locomotor changes. *Curr. Biol.* **20**: 921-926.
44. Harley, C.M. and R.E. Ritzmann (2010) Electrolytic Lesions within Central Complex Neuropils of the Cockroach Brain Affect Negotiation of Barriers. *J. Exp. Biol.* **213**:2851-2864.
45. Bender, J.A., E.M. Simpson and R.E. Ritzmann (2010) Computer-assisted 3D kinematic analysis of all leg joints in walking insects. *PLoS ONE* **5**: e13617.doi:10.1371/journal.pone.0013617.
46. Bender, J.A., E.M. Simpson, B.R. Tietz, K.A. Daltorio, R.D. Quinn, and R.E. Ritzmann Kinematic and behavioral evidence for a distinction between trotting and ambling gaits in the cockroach, *Blaberus discoidalis*. *J. Exp. Biol* **214**:2057-2064.

ABSTRACTS over last 10 years (out of 146 total):

1. Kaliyamoorthy, S., S. Zill, R. Ritzmann, J. Choi and R. Quinn (2001) Finite element analysis of exoskeletal strains and discharges of force receptors during walking and climbing. *Soc. Neurosci. Abstr.* **27**: program no. 518.12.
2. Ritzmann, R.E., C.M. Rice, A.J. Pollack, A.L. Ridgel, D.A. Kingsley, and R.D. Quinn (2001) Roles of Descending Control in Locomotion through Complex Terrain. *The Sixth International Congress of Neuroethology*, July 29-August 3, 2001 vol. 6, p. 234.
3. Birch, M.C., Quinn, R.D., Ritzmann, R.E. Pollack, A.J., Phillips, S.M. (2002), Micro-robots inspired by crickets. Proceedings of Climbing and Walking Robots Conference (CLAWAR02), Paris, France.
4. Bachmann, R.J., Kingsley, D.A., Quinn, R.D., Ritzmann, R.D. (2002), A Cockroach Robot with Artificial Muscles. Proceedings of Climbing and Walking Robots Conference (CLAWAR02), Paris, France.
5. Choi, J., Watson, J.T., Nelson, G.M., Ritzmann, R.E., Quinn, R.D., (2002) Virtual versus real locomotion over obstacles. 5th Int. Conf. On Dynamics and Control of Systems and Structures in Space, Cambridge, England, July 14-18.

6. Quinn, R.D., T.J. Allen, A.D. Horchler, A.J. Pollack, M.C. Birch, B.L. Rutter, L. Mu, R.J. Bachmann, R.E. Ritzmann (2002) Two distinct but complementary strategies for biorobotic development. *Soc. Neurosci. Abstr. CD ROM 28*: Prog Numb. 465.3.
7. Pollack, A.J., R.E. Ritzmann, R.D. Quinn, T.E. Wei. (2002) Role of higher centers of insect CNS in climbing and incline running. *Soc. Neurosci. Abstr. CD ROM 28*: Prog Numb. 465.2.
8. Ridgel, A.L., B.E. Alexander, L. Mu, R.E. Ritzmann, N. Strausfeld (2002) Roles Of Descending Control In Insect Turning. *Soc. Neurosci. Abstr. CD ROM 28*: Prog Numb. 465.4.
9. Vaidyanathan, R., Williams, C., Prince, T.S., Ritzmann, R.E., Quinn, R.D., (2002), "An Insect-Inspired Targeting/Evasion Reflex for Autonomous Air Vehicles," 2002 Digital Avionics Conference.
10. Kingsley, D.A., Quinn, R.D., Ritzmann, R.E., (2003) "A cockroach inspired robot with artificial muscles," Int. Symposium on Adaptive Motion of Animals and Machines (AMAM), Kyoto, Japan.
11. Vaidyanathan, R., Williams, C., Prince, T.S., Ritzmann, R.E., Quinn, R.D., (2002), "An Insect-Inspired Targeting/Evasion Reflex for Autonomous Air Vehicles," 2002 Digital Avionics Conference (Won best paper in session award).
12. Quinn, R.D., T.J. Allen, A.D. Horchler, J.M. Morrey, B. Lambrecht, A.J. Pollack, M.C. Birch, B.L. Rutter, L. Mu, R.J. Bachmann, R.E. Ritzmann (2003) Two distinct but complementary strategies for biorobotic development. *CWRU ShowCase, April 4*.
13. Ritzmann, R.E., A.L. Ridgel, B.E. Alexander, L. Mu, A.J. Pollack (2003) Descending control in insect locomotion over and around barriers *CWRU ShowCase, April 4*
14. Allen, T.J., Quinn, R.D., Bachmann, R.J., and Ritzmann, (2003) Abstracted Biological Principles Applied with Reduced Actuation Improve Mobility of Legged Vehicles. IEEE Int. Conf. On Intelligent Robots and Systems (IROS'03), Las Vegas, Nevada.
15. Morrey, J.M., Lambrecht, B., Horchler, A.D., Ritzmann, R.E., and Quinn, R.D., (2003) Highly Mobile and Robust Small Quadruped Robots. IEEE Int. Conf. On Intelligent Robots and Systems (IROS'03), Las Vegas, Nevada.
16. Mu, L. A.L. Ridgel, , B.E. Alexander, R.E. Ritzmann (2003) The role of brain neuropils during turning in the cockroach. *Soc. Neurosci. Abstr. CD ROM 29*: Prog Numb. 606.4.
17. Pollack, A.J., R.E. Ritzmann, A.L. Ridgel, J. Archinal (2003). Incline climbing behaviors in cockroach require intact connections from brain. *Soc.. Neurosci. Abstr. CD ROM 29*: Prog Numb. 606.5.
18. Ridgel, A.L., R.E. Ritzmann, P.L. Schaefer (2003). Effects of aging on behavior and leg kinematics in the cockroach. *Soc. Neurosci. Abstr. CD ROM 29*: Prog Numb. 606.2.
19. Kingsley, D.A., Quinn, R.D., Ritzmann, R.E., (2003) "A cockroach inspired robot with artificial muscles," Int. Symposium on Adaptive Motion of Animals and Machines (AMAM'03), Kyoto, Japan.
20. Kingsley, D.A., Quinn, R.D., Ritzmann, R.E., (2003) "A cockroach inspired robot with artificial muscles," Int. Symposium on Adaptive Motion of Animals and Machines (AMAM'03), Kyoto, Japan.
21. Quinn, R.D., Kauer, J.S., Willis, M.A., Ritzmann, R.E., Young, D., White, J. (2004) A Biologically Inspired System For Demining, UXO Site Remediation, And National Security Missions. 2004 Mine Warfare Conference (MINWARA), Naval Post Graduate School, Monterey, CA.
22. Horchler, A.D., Reeve, R.E., Webb, B.H., Quinn, R.D., Ritzmann, R.E., (2004) Investigating Conflicting Orientation Systems Using A Robot. *ShowCASE, April 2*.

23. Horchler, A.D., Reeve, R.E., Webb, B.H., Quinn, R.D., Ritzmann, R.E., (2004) Investigating Conflicting Orientation Systems Using A Robot. *ShowCASE*, April 2.
24. Choi, J., Rutter, B.L., Kingsley, D.A., Ritzmann, R.E., Quinn, R.D. (2005) A Robot with Cockroach Inspired Actuation and Control. *Advanced Intelligent Mechatronics Proceedings, 2005 IEEE/ASME International Conference.*, Monterey, CA, pp. 1569 – 1574.
25. Daltorio, K.A., Funt, J.M, Horchler, A.D. Gorb, S.M., Ritzmann, R.E, Quinn, R.D., (2005) Insect-inspired attachment mechanisms enable a small robot to climb glass walls. *Soc. Neurosci. Abstr. CD ROM 31*: 176.7.
26. Daltorio, K.A., Horchler, A.D., Gorb, S., Ritzmann, R.E., Quinn, R.D. (2005) A small wall walking robot with compliant adhesive feet, *Proceedings of Climbing and Walking Robots Conference (CLAWAR'05)*, London, U.K., September, 2005.
27. Harley, C.M., Lewinger, W.A., Ritzmann, R.E., Quinn, R.D., (2005) Characterization of obstacle avoidance behaviors in the cockroach *Blaberus discoidalis* and implementation in a semi-autonomous robot. *Soc. Neurosci. Abstr. CD ROM 31*: 176.10.
28. Mu, L, Ritzmann, R.E., (2005) Alteration of Coordinated Joint Movement Demonstrated by Turning and Searching Behaviors in the Cockroach, *Blaberus discoidalis*. *Soc. Neurosci. Abstr. CD ROM 31*: 176.8.
29. Ridgel, A.L., Pollack, A.J., Partusch, M., Ritzmann, R.E., Daly, K.C., (2005) Role of brain circuits during transitional locomotion in the cockroach. *Soc. Neurosci. Abstr. CD ROM 31*: 176.9.
30. Rutter, B.L., Mu, L. Ritzmann, R.E., Quinn, R.D., (2005) A model that transforms insect electromyograms into pneumatic muscle control. *Soc. Neurosci. Abstr. CD ROM 31*: 176.12.
31. Daltorio, K., Gorb, S., Peressadko, A., Horchler, A.D., Ritzmann, R.E., Quinn, R.D., (2006) A Biologically Inspired, Vertical-Surface Climbing Robot, *ShowCASE*, Cleveland, Ohio Apr. 6, 2006.
32. Daltorio, Kathryn A. Terence E. Wei, Stanislav N. Gorb, Jason M. Funt, Roy E. Ritzmann and Roger D. Quinn. “Enhancing Robotic Mobility Through Insect Strategies” *International Symposium for Biologically-Inspired Design and Engineering*. Atlanta, Georgia. May 10-12, 2006.
33. Daltorio, K.A., Wei, T.E., Gorb, S.N., Ritzmann, R.E., Quinn, R.D. (2006) Insect-inspired foot geometry for rotating legs on a climbing robot. *Soc. Neurosci. Abstr. CD ROM 32*: 449.14.
34. Harley, C.M., Lewinger, W.A., Ritzmann, R.E., Quinn, R.D., (2006) Characterization of obstacle avoidance behaviors in the cockroach *Blaberus discoidalis* and implementation in a semi-autonomous robot. *Research ShowCASE*, Cleveland, OH April 6.
35. Harley, C.M. Predina, J.D., Ritzmann, R.E. (2006) Responses to incomplete sensory information in cockroach climbing behavior. *Soc. Neurosci. Abstr. CD ROM 32*: 449.12.
36. Harley, C.M. and R.E. Ritzmann (2006) Complex Decisions about Simple Obstacles: Cockroach Climbing and Tunneling, *East Coast Nerve Net*. Woods Hole, Ma. April 1, 2006.
37. Mu, L, Ritzmann, R.E., (2006) Neural control mechanism for motor pattern change in cockroach turning behavior. *Research ShowCASE*, Cleveland, OH April 6.
38. Mu, L., Taylor, B.K., Rutter, B.L., Ritzmann, R.E. (2006) Altered joint reflexes in the cockroach may lead to directional changes in leg extension. *Soc. Neurosci. Abstr. CD ROM 32*: 449.11.
39. Pollack, A.J., Ridgel, A.L., Ritzmann, R.E. (2006) Multi-unit recording in cockroach brain associated with antennal mediated turning. *Soc. Neurosci. Abstr. CD ROM 32*: 449.10.

40. Quinn, R.D., Gorb, S. and Ritzmann, R.E. (2006) Nature holds solutions for mobile robots. *US Industry Today*, Volume 9, Issue 4, pp 6-7.
41. Ridgel, A.L., Pollack, A.J., Partusch, M., Ritzmann, R.E., Daly, K.C., (2006) Role of brain circuits during transitional locomotion in the cockroach. *Research ShowCASE*, Cleveland, OH April 6.
42. Rutter, B.L., Lewinger, W., Taylor, B., Wilson, M., Blümel, M., Ekeberg, Ö., Büschges, A., Ritzmann, R.E., Quinn, R.D. (2006) Neurally-based robot control for neuromechanical modeling of insect stepping. *Soc. Neurosci. Abstr. CD ROM 32*: 449.13.
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44. Rutter, B., L. Mu, R.D. Quinn, and R.E. Ritzmann. (2006) A Model that Transforms Insect Electromyograms into Pneumatic Muscle Control. International Symposium for Biologically-inspired Design and Engineering. Atlanta, GA: Center for Biologically Inspired Design. Online
45. Rutter, B., L. Mu, R.E. Ritzmann, R. Quinn (2006) Transforming Insect Electromyograms into Pneumatic Muscle Control. Proceedings of SPIE 6230 "Unmanned Systems Technology VIII" June 2006. Online.
46. Wei, T.E. K.A. Daltorio, S.N. Gorb, J.M. Funt, R.E. Ritzmann and Roger D. Quinn. "Enhancing Robotic Mobility Through Insect Strategies" *Intelligence Community Postdoctoral Fellowship Colloquium*. Washington DC. April 17-19, 2006.
47. Wei, T.E., K.A. Daltorio, S. N. Gorb, L. Southard, R.E. Ritzmann, and R.D. Quinn "A Small Climbing Robot with Compliant Ankles and Multiple Attachment Mechanisms," *Int. Conf. on Climbing and Walking Robots (CLAWAR '06)*, Brussels, Belgium. September 12-14, 2006.
48. Xu, Y., (2006) Role of the Central Complex on Transitional Behaviors of *Blaberus discoidalis*, Proceedings of National Conference on Undergraduate Research (NCUR'06), Asheville, NC, April 6-8, 2006. (Undergraduate student who worked in our lab during 2005 SPUR program presented her work at this undergraduate conference).
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50. Daltorio, K.A., T.E. Wei, G.D. Wile, S.N. Gorb, R.E. Ritzmann, R.D. Quinn. "Insect-Inspired Foot Geometry for Rotating Legs on a Climbing Robot." *Research ShowCASE*, April 12, 2007.
51. Harley, C.M., Pollack, A.J., Ritzmann, R.E. (2007) Discrete lesions within the cockroach brain and their effect on negotiation of barriers. Eighth Cong. Neuroethol. **8:P052**, July 22-27, Vancouver, BC, Canada
52. Ritzmann, R.E., Pollack, A.J., Ridgel, A.L. (2007) Extracellular recordings in the central body complex of the cockroach *Blaberus discoidalis*. Eighth Cong. Neuroethol. **8:P053**, July 22-27, Vancouver, BC, Canada.
53. Mu, L., Ritzmann, R.E. (2007) Interaction between descending input and local thoracic reflexes for joint coordination, Eighth Cong. Neuroethol. **8:P0230**, July 22-27, Vancouver, BC, Canada.
54. Rutter, B.L. W.A. Lewinger, B.K. Taylor, M. Wilson, M. Blümel, Ö. Ekeberg, A. Büschges, R.E. Ritzmann, R.D. Quinn. (2007) "Neurally-based robot control for neuromechanical modeling of insect stepping," *Research ShowCASE*, Case Western Reserve University, April 11-12, 2007. (Awarded Honorable Mention)

55. Rutter, B.L., Taylor, B.L., Mu, L. Ritzmann, R.E. (2007) A functional kinematic model of the cockroach mesothoracic leg. *Neuroethol.* **8:P0232**, July 22-27, Vancouver, BC, Canada.
56. Bender, J.A., B.L. Rutter, E.M. Simpson, T. Papay, D.Parker, B.K. Taylor, R.D. Quinn, R.E. Ritzmann. (2008) Robotic control based on cockroach 3D leg kinematics. 4th meeting of AMAM, June 1-6, 2008, Cleveland, OH. **4:200**
57. Bender, J.A., E.M. Simpson, R.E. Ritzmann (2008) Increased Stereotypy of Leg Movement Patterns with Increased Walking Speed in the Cockroach. *Soc. Neurosci. Abstr. CD ROM* **34:198.6**.
58. Daltorio, K.A. Boxerbaum, A.S., Witushynsky, T.C., Wile, G.D., Palmer, L.R., Malek, A.A., Ahmad, M.R. Southard, Stanislav N. Gorb, L.S., Ritzmann, R.E, Quinn, R.D. (2008) The Effect of a Body Joint on Performance of Whegs™ overRough Terrain. 4th meeting of AMAM, June 1-6, 2008, Cleveland, OH. **4:192**.
59. Harley, C., English, B., Ritzmann, R.E. (2008) Using Your Head: The Involvement of the Cockroach Brain and Head Sensors in Obstacle Negotiation. 4th meeting of AMAM, June 1-6, 2008, Cleveland, OH. **4:135**
60. Harley, C.M., S.J. Awe, R.E. Ritzmann (2008) Discrete lesions within the cockroach brain effect obstacle negotiation behaviors. *Soc. Neurosci. Abstr. CD ROM* **34:198.1**.
61. Pollack, A.J. Kathmann, N.D. Ritzmann, R.E. (2008) Characterization of the Cockroach Brain Central Complex Utilizing Extracellular Multi-Unit Techniques. 4th meeting of AMAM, June 1-6, 2008, Cleveland, OH. **4:133**
62. Ritzmann, R.E., N.D. Kathman, A.J. Pollack (2008) Extracellular responses in units recorded in the cockroach brain central complex. *Soc. Neurosci. Abstr. CD ROM* **34:198.9**.
63. Rutter, B.L., Bender, J.A., Papay, T., Parker, D.A., Taylor, B.K., Ritzmann, R.E., Quinn, R.D. (2008) Neuromechanically Based Robotic Models for Biological Experimentation. 4th meeting of AMAM, June 1-6, 2008. Cleveland, **4:243**.
64. Rutter, B.L. W.A. Lewinger, B.K. Taylor, M. Wilson, M. Blümel, Ö. Ekeberg, A. Büschges, R.E. Ritzmann, R.D. Quinn. (2008) Neurally-based robot control for neuromechanical modeling of insect stepping. 4th meeting of AMAM, Cleveland (OH), USA, June 1-6, 2008.
65. Rutter, B.L., J.A. Bender, B.K. Taylor, R.E. Ritzmann, R.D. Quinn (2008) Experiments in locomotion with neuromechanically based robotic insect models. *Soc. Neurosci. Abstr. CD ROM* **34:198.7**.
66. Wile, G.D. Daltorio, K.A., Palmer, L.R., Gorb, S.N., Ritzmann, R.E., Quinn, R.D. (2008) Screenbot: Traversing Screens Using Opposing Spines. 4th meeting of AMAM, June 1-6, 2008, Cleveland, OH.
67. Harley, C.M., L. Mu, R.E. Ritzmann (2009) Lesions within the specific cockroach brain regions reveal control for obstacle avoidance. *Soc. Neurosci. Abstr.* **35:287.5**.
68. Pollack, A.J., J.A. Bender, R.E. Ritzmann, (2009) Multi-unit brain recordings in the central complex of walking cockroaches. *Soc. Neurosci. Abstr.* **35:287.6**.
69. Ritzmann, R.E., N.D. Kathman, P. Guo (2009) Responses to multifaceted sensory stimuli in the cockroach brain central complex. *Soc. Neurosci. Abstr.* **35:287.4**.
70. Rutter, B.L., J.A. Bender, R.E. Ritzmann, R.D. Quinn (2009) Descending commands modify local feedback circuitry to effect behavioral transitions in a robotic neuromechanical cockroach leg model. *Soc. Neurosci. Abstr.* **35:287.3**.

71. Ritzmann, R.E., J.A. Bender, N.D. Kathman. (2010) Multi-channel Analysis of Sensory Integration within the Central Complex of the Cockroach. Ninth Cong. Neuroethol. **9**: P347 **August 2-7**, Salamanca, Spain.
72. Bender, J.A., B.R. Tietz, K.A. Daltorio, A.E. Brown, A.L. Horomanski, R.D. Quinn, R.E. Ritzmann. (2010) Optomotor and Goal-oriented Turning Behavior in Tethered and Free-walking Cockroaches. Ninth Cong. Neuroethol. **9**: P352 **August 2-7**, Salamanca, Spain.
73. Horchler, A.D., R.E. Ritzmann, R.D. Quinn. (2010) A Dynamical Systems Approach to Behavior Modulation and Decision Making. Ninth Cong. Neuroethol. **9**: P114. **August 2-7**, Salamanca, Spain.
74. Guo, P., A. J. Pollack, R. E. Ritzmann (2011) The role of the central complex of the insect brain in antenna guided turning. *Soc. Neurosci. Abstr.* **37**: 944.03.
75. Kathman, N.D., A. L. Horomanski, A. J. Pollack, R. E. Ritzmann (2011) The role of the central complex in optomotor behavior of the cockroach. *Soc. Neurosci. Abstr.* **37**: 944.06.
76. Klein, M.A., A. E. Brown, W. Li, S. N. Zill, R. D. Quinn, R. E. Ritzmann (2011) Biological observation and robotic modeling to understand leg control in the cockroach *Blaberus discoidalis*. *Soc. Neurosci. Abstr.* **37**:944.02.
77. Pollack, A.J., , A. L. Horomanski, N. D. Kathman, R. E. Ritzmann (2011) Neurophysiological and behavioral effects of procaine microinjections into the cockroach central complex. *Soc. Neurosci. Abstr.* **37**: 944.04.
78. Tietz, B.R., K. A. Daltorio, J. A. Bender, D. A. Porr, J. T. Richards, N. S. Szczecinski, V. A. Webster, R. D. Quinn, R. E. Ritzmann; (2011) Robotic modeling of goal directed behavior in the cockroach *Blaberus discoidalis*. *Soc. Neurosci. Abstr.* **37**: 944.05.

VIDEO PROCEEDINGS:

1. Quinn, R.D., Kingsley, D.A., Offi, J. and Ritzmann, R.E., “Its got whlegs” 2002 IEEE International Conference on Robotics and Automation (ICRA’02) Video Proceedings, Washington, D.C., May, 2002.
2. Morrey, J.M., Horchler, A.D., Didona, N., Lambrecht, B., Ritzmann, R.E. and Quinn, R.D. (2003) Increasing Small Robot Mobility Via Biological Inspiration, 2003 IEEE International Conference on Robotics and Automation (ICRA’03) Video Proceedings, Taiwan. (Runner up for Best Video Award).
3. Lewinger, W.A., C.M. Harley, R.E. Ritzmann, M.S. Branicky, R.D. Quinn (2005) Insect-like Antennal Sensing for Climbing and Tunneling Behavior in a Biologically-inspired Mobile Robot, 2005 IEEE International Conference on Robotics and Automation, Barcelona, Spain - Awarded Best Video.
4. Daltorio, K.A., Gorb, S., Peressadko, A., Horchler, A.D., Ritzmann, R.E., Quinn, R.D. (2006) Wall-Climbing Mini-Whlegs™. IEEE International Conference on Robotics and Automation (ICRA ‘06) Video Proceedings, Orlando
5. Daltorio, K.A., Wei, T.E., Wile, G.D., Southard, L., Gorb, S., Ritzmann, R.E., Quinn, R.D. (2007) Mini-Whlegs™ climbing steep surfaces with insect inspired attachment mechanisms, Video Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'07), San Diego, October 29 – November 2.
6. Wile, G.D., Daltorio, K.D., Palmer, L., Witushynsky, T., Southard, L., Ahmad, M.R., Malek, A., Gorb, S.N., Boxerbaum, A., Ritzmann, R.E., Quinn, R.D. (2008) Making Orthogonal Transitions with Climbing

Mini-Whegs™, IEEE International Conference on Robotics and Automation (ICRA '08) Video Proceedings, Pasadena.

7. Wile, G.D. Daltorio, K.A., Diller, E.D., Palmer, L.R., Gorb, S.N., Ritzmann, R.E. and Quinn, R.D. (2008) Screenbot: Walking inverted using distributed inward gripping, **Video Proceedings** of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'08), Nice, France.

BOOK CHAPTERS over last 10 years (out of 14 total):

1. R.D. Quinn and R.E. Ritzmann (2001) Construction of a hexapod robot with cockroach kinematics benefits both robotics and biology. In Biorobotics eds. B. Webb and Consi. MIT press, pp 87-105..
2. Quinn, R.D., Colbrunn, R.W., Nelson, G.M., Kingsley, D.A., Bachmann R.J., Ritzmann, R.E., (2001) McKibben Artificial Muscles for Insect Inspired Robots, in Biomechanical Modeling, edited by M.D. Grabiner.
3. Quinn, R.D., Nelson, G.M. and Ritzmann, R.E. (2002) "Toward the Development of Agile and Mission Capable Legged Robots" in Neurotechnology for Biomimetic Robots, edited by J. Ayers, J. Davis, and A. Rudolph, MIT Press, MA, pp 401-418.
4. Ritzmann, R.E. and Zill, S.N. (2003) "Walking and Jumping" in Encyclopedia of Insects edited by V.H. Rush and R.T. Carde, Academic Press. pp 1174-1179.
5. Ritzmann, R.E. and Quinn, R.D. (2004) "Locomotion in Complex Terrain" in Walking: Biological and Technological Aspects edited by F. Pfeiffer and T. Zielinska. Springer, Wien and New York pp 31-49
6. Quinn, R.D. and Ritzmann, R.E. (2006) "Biologically Inspired Robotics" in McGraw-Hill Yearbook of Science and Technology McGraw-Hill Press, NY.
7. Ritzmann, R.E. and Büschges, A. (2007) "Insect Walking: From Reduced Preparations to Natural Terrain." in Invertebrate Neurobiology, eds. G. North and R. Greenspan. Cold Spring Harbor Press, Cold Spring Harbor, NY. 229-250.
8. Ritzmann, R.E. and Zill, S.N. (2009) "Walking and Jumping" in Encyclopedia of Insects 2nd edition. edited by V.H. Rush and R.T. Carde, Academic Press. pp 1044-1048.

BOOKS EDITED:

1. Beer, R.D. , R.E. Ritzmann and T. McKenna (1993) Biological Neural Networks in Invertebrate Neuroethology and Robotics. Academic Press, NY.

INVITED PRESENTATIONS over last 10 years (out of 102 total):

1. Ritzmann, R.E. and R.D. Quinn (2001) Insect Neuromechanical Designs for Improved Robotic Mobility", CWRU College of Engineering Seminars, February 9, 2001.
2. Ritzmann, R.E. and R.D. Quinn (2001) "Insect Neuromechanical Designs for Improved Robotic Mobility", Great Lakes Science Center, Cleveland, OH, March 10, 2001 and April7, 2001.

3. Ritzmann, R.E. (2001) Seminar at Andrews University, Berien Springs, MI. "Insect Locomotion in Complex Terrain: A Neuroethological and Robotics Approach" April 19, 2001.
4. Quinn, R.D. and R.E. Ritzmann (2001) "Insect Designs for Improved Robot Mobility". Keynote address at Singapore Robotic Games, May 17, 2001.
5. Quinn, R.D. and R.E. Ritzmann (2001) "Biologically-Inspired Robotics" Full Day Workshop at Singapore Robotic Games, May 18, 2001.
6. Quinn and Ritzmann (2001). Presented "Climbing Robots for Defeating Hard and Buried Targets," Eglin AFB, Fort Walton Beach, June 5, 2001.
7. Quinn, R.D. and R.E. Ritzmann (2001) "Insect Designs for Improved Robot Mobility". Ohio Aerospace Institute Seminar, June 8, 2001.
8. Quinn and Ritzmann (2001). Presented "Improved Mobility through Insect Designs," ONR Workshop on Biorobotics, Arlington, VA, July 12, 2001.
9. Quinn, R.D. and R.E. Ritzmann (2001) "Insect Designs for Improved Robot Mobility". CWRU Freshman Forum, August 20, 2001.
10. Ritzmann, R.E. (2001) "Interaction between higher centers and thoracic circuits for locomotion in complex terrain" International Symposium on "Neuronal Organization and Plasticity in the Microbrain System", Tsukuba, Japan, October 13-14, 2001.
11. Ritzmann, R.E. (2002) "Hexapod walking in unpredictable terrain", International Symposium on "A Systems Approach to Motor Behaviour: From Physiology to Biomimetic Models", Bielefeld, Germany, June 25 - 27, 2002
12. Ritzmann, R.E. (2002) "Solutions to Moving over Complex Terrain Found in Cockroach Locomotion" Workshop on "Robotics as Theoretical Biology", Edinburgh, UK, August 10, 2002.
13. Quinn, R.D. and R.E. Ritzmann (2002) "Insect Designs for Improved Robot Mobility". CWRU Freshman Forum, August 20, 2002.
14. Quinn, R.D. and Ritzmann, R.E. (2003), "Biologically Inspired Robots: Running, Jumping, Crawling and Flying", Strongsville High School Physics Club, February (Presented by R.D. Quinn).
15. Ritzmann, R.E. (2003) "Getting Around on a Flat Surface: Walking and Turning in the cockroach *Blaberus discoidalis*". Florida State University, Rushton Lectures March 8, 2003.
16. Ritzmann, R.E. and R.D. Quinn (2003) "Get Over It! Dealing with Barriers to Insect and Robotic Locomotion". Florida State University, Rushton Lectures March 8, 2003. (Presented by R.E. Ritzmann)
17. Ritzmann, R.E. and R.D. Quinn (2003) "Control of Legged Locomotion Over Complex Terrain By Cockroaches and Robots" IGERT Research Symposium at Carnegie Mellon University, Pittsburgh, PA June 27-29, 2003.
18. Ritzmann, R.E. (2003) "Control of Legged Locomotion Over Complex Terrain By Cockroaches and Robots" American Behavior Society symposium. "Mechanisms of Behavioral Switching", Boise State University, Boise, Idaho, July 20, 2003.
19. Ritzmann, R.E. (2003) Participation (four lectures) in a course entitled "Walking-Biological and Technological Aspects" at the International Centre for Mechanical Sciences, Udine Italy, September 8-12, 2003.

20. Ritzmann, R.E. and R.D. Quinn (2003) "Control of legged locomotion over complex terrain by cockroaches and robots" at 4th Shanghai Roundtable: Nature as Engineer and Teacher: Learning for Technology from Biological Systems, Shanghai Institute for Advanced Studies, Shanghai, China, October 8-11, 2003.
21. Ritzmann, R.E. (2004) "Interaction Between Brain Centers and Local Circuits in Movement Control" Systems Engineering Working Group – DARPA, Ann Arbor, MI, June 29, 2004.
22. Ritzmann, R.E. (2004) "Interfacing Neuroethology and Biorobotics: Hints from Convergent Evolution" Workshop on Neuromorphic Engineering, Telluride, CO, July 12, 2004.
23. Ritzmann, R.E. (2004) "Control of Legged Locomotion Over Complex Terrain by Cockroaches and Robots" Workshop on Insect Sensors and Robotics, Brisbane, Australia, August 23-26, 2004.
24. Ritzmann, R.E. (2005) "It takes Brains for Insects or Robots to Walk over Complex, Unpredictable Terrain" Case Western Reserve University, Department of Neuroscience, Cleveland, OH, 02/03/2005.
25. Ritzmann, R.E. (2005) "It takes Brains for Insects or Robots to Walk over Complex, Unpredictable Terrain" Case Western Reserve University, Department of Biology, Cleveland, OH, 02/17/2005.
26. Ritzmann, R.E. (2005) "It takes Brains for Insects or Robots to Walk over Complex, Unpredictable Terrain" Department of Neuroscience, Tufts University School of Medicine, 03/30 /2005.
27. Ritzmann, R.E. (2005) "Movement Through Complex Terrain: Robots and Insects" Neuromorphic Engineering Workshop, June 28, 2005, Telluride, CO.
28. Ritzmann, R.E. (2005) "The Mechanical Roach: Interaction between Descending and Local Control" Gordon Conference "Neuroethology, Behavior, Evolution and Neurobiology" August 11, 2005, Oxford, UK.
29. Ritzmann, R.E. (2005) "Movement through Complex Terrain: Robots and Insects" seminar at University of Indiana. September 16, 2005, Bloomington, ID.
30. Ritzmann, R.E. (2005) " Movement Through Complex Terrain: From Animals To Robots And Back" 3rd International Symposium on Adaptive Motion in Animals and Machines - AMAM 2005 (keynote address). Technische Universität Ilmenau, Germany, September 26, 2005.
31. Ritzmann, R.E. (2005) "Movement through Complex Terrain: Robots and Insects" seminar at W. M. Keck Center for Behavioral Biology, North Carolina State University. November 28, 2005.
32. Ritzmann, R.E. (2006) "Movement through Complex Terrain: Robots and Insects" Kenneth Roeder Memorial Lecture at Tufts University. April 6, 2006.
33. Ritzmann, R.E. (2006) "Movement through Complex Terrain: Robots and Insects" Symposium "Bugs Did It First, Insect-Inspired Technology," at meeting of American Entomological Society, December 13, 2006, Indianapolis, IN.
34. Ritzmann, R.E. (2007) "Dealing with Barriers in Unpredictable Terrain" in conference entitled "Insect Behavior: Small Brains, Big functions" HHMI Janelia Farm Research Campus, March 13 – 15, 2007.
35. Ritzmann, R.E. (2007) "Movement Through Complex Terrain in Insects and Robots" in conjunction with full day workshop on Biomimetic Robotics at the ICRA 2007 conference, Rome, Italy, April 14, 2007.

36. Ritzmann, R.E. (2007) "Movement Through Complex Terrain by Insects and Robots" presented as part of a symposium entitled "Grappling with complexity: re-emergence of "simple" systems" organized by J. Gray for the 8th Intl. Cong. of Neuroethol., Vancouver, BC, Canada, July 24, 2007.
37. Ritzmann, R.E. (2007) "Movement Through Complex Terrain in Insects and Robots" plenary lecture for the Annual Meeting of the Entomological Society of Canada, Saskatoon, Saskatchewan September 30, 2007.
38. Ritzmann, R.E. (2007) "Dealing with Barriers in Unpredictable Terrain with Brain Centers and Local Control Circuits of Insects and Robots" in conference entitled "Insect Brain and Control of Behaviour" organized by M. Heisenberg at the Evangelische Akademie Tutzing, Germany. Oct 12, 2007.
39. Ritzmann, R.E. (2007) "How do Insects and Insect Inspired Robots Deal with Barriers?" Dept. of Cognitive Science, Case Western Reserve University. Nov. 15, 2007.
40. Ritzmann, R.E. (2008) "How do Insects and Insect Inspired Robots Deal with Barriers?" Dept. of Biology, West Virginia University. Feb. 04, 2008.
41. Ritzmann, R.E. (2008) "How do Insects Re-direct Leg Movements to Deal with Barriers?" MBI Workshop on Neuromechanics of Locomotion, Ohio State University (3/31/2008 – 4/4/2008).
42. Ritzmann, R.E. (2008) DuPont Lectures (2), University of Arizona (4/07 – 4/09/2008).
43. Ritzmann, R.E. (2008) "How do Insects and Insect Inspired Robots Deal with Barriers?" Dept. of Entomology, University of Illinois, April 28, 2008.
44. Ritzmann, R.E. (2008) "Dealing with Barriers: Behavioral Choice, Local Changes and Multi-sensory Responses in the Central Complex" in conference entitled "Functional Anatomy of the Arthropod Central Complex and Motor System" HHMI Janelia Farm Research Campus, May 11-14. 2008.
45. Ritzmann, R.E. (2008) "Dealing with Barriers: Behavioral Choice, Local Changes and Multi-sensory Responses in the Central Complex" Georgia State University "Brains & Behavior Distinguished Lecturer" series. October 14, 2008.
46. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior, Brains and Robots" Case Western Reserve University, Department of Biology, Cleveland, OH. January 22, 2009.
47. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior, Brains and Robots". Bowling Green State University, Bowling Green, OH. February 19, 2009.
48. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior, Brains and Robots". Brock University, St. Catharines, Ont. Canada March 6, 2009.
49. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior, Brains and Robots" in seminar entitled "The arthropod central complex: Evolutionary, developmental, genetic & functional aspects" German Neuroscience Meeting, Göttingen, Germany, March 25-29, 2009.
50. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior, Brains and Robots". University of Akron, Akron, OH, April 9, 2009.
51. Ritzmann, R.E. (2009) "Negotiating Complex Terrain: Insect Behavior and Brains" Joint US/UK Workshop on BIO-INSPIRED Approaches for Surveillance and Sensing Application. Chilworth Manor, Southampton, England, September 7-10, 2009.

52. Ritzmann, R.E. and Quinn, R.D. (2009) “Bugs and Bots: Getting Around Complex Terrain by Agile Agents”. Science Café Presentation, Great Lakes Brewing Company, Cleveland, OH, September 14, 2009.
53. Ritzmann, R.E (2010) “Negotiating Complex Terrain: Insect Behavior and Brains” Holgerfest Workshop, Eglin AFB, Fort Walton Beach, FL, April 19-21, 2010.
54. Ritzmann, R.E. (2010) “Negotiating Complex Terrain: Insect Behavior and Brains” ONR & AFOSR Bio-Inspired Autonomous Systems, Arlington, VA, may 19-21, 2010.
55. Ritzmann, R.E. (2010) “Negotiating Complex Terrain: What Must We Understand to Develop Truly Animal-like Robots? 3rd International Conference of Bionic Engineering (ICBE’10), Zhuhai, China. Sept. 14-16, 2010 (Invited Keynote Presentation).
56. Ritzmann, R.E. (2010) “Negotiating Complex Terrain: What Must We Understand to Develop Truly Animal-like Robots? Invited Workshop on Frontier of Biomimetics. Nanjing, China. Sept. 18, 2010 (Invited Keynote Presentation).
57. Ritzmann, R.E. (2011) “Negotiating Complex Terrain: Insect Brains and Behavior – Not So Simple After All” University of Texas, Section of Neurobiology, Austin, Texas. March 28, 2011.
58. Ritzmann, RE (2011) “Negotiating Complex Terrain: Insect Brains and Behavior – Not So Simple After All” Joint US/UK Workshop on BIO-INSPIRED Approaches for Surveillance and Sensing Application. Chilworth Manor, Southampton, England, July 12-15, 2011.
59. Ritzmann, RE (2011) “Negotiating Complex Terrain: Insect Brains and Behavior and their Impact on Robotic Design”, 5th International Symposium on Adaptive Motion in Animals and Machines - AMAM 2011 (Invited Plenary Talk). Osaka, Japan, October 11-14, 2011.
60. Ritzmann, RE (2011) “Negotiating Complex Terrain: Insect Brains and Behavior – Not So Simple After All” invited presentation in conference entitled “The Neural Basis of Motor Control” HHMI Janelia Farm Research Campus, Oct 30- Nov. 2. 2011.

Coverage of Research in Popular Venues over last 10 years (out of 23 total)

1. Featured in article in *Akron Beacon Journal* “Robot Roaches Creep up Technology Chain” by Jim Carney, 6/29/2001.
2. Featured in article in *Nature* on High-speed Video: Dalton, R (2002) “Caught on Camera” *Nature*: 418:721-722.
3. Article in Plain Dealer by Brian Albrecht (4/3/2003)
4. Featured in article in *The New York Times* by James Gorman “What Really Happens When Fruit Flies Fly” 06/10/2003.
5. Featured in Discovery Channel Television Show “Ultimate Impact” shown in Canada and France, 2003.
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7. Article in “Times for Kids” by “Robots that look as if they crawled out from under a rock may one day work for you”, Kathy Satterfield, March 4, 2005.

8. Featured in Animal Planet Show “Buggin’ with Ruud” episode entitled “Bug Superheroes” aired November 27, 2005.
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11. Interviewed by Jim McIntyre, WDOK regarding AMAM 2008. May 25, 2008.
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Patents

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