

CURRICULUM VITAE

JEFFREY L. KRICHMAR

WORK ADDRESS

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EDUCATION

1991 - Doctor of Philosophy in Computational Science and Informatics
1997 Computational Biology and Neuroscience Track
Dissertation: "A Computational Model of Cerebellar Saccadic Control."
Dissertation Defense: May 1, 1997.
George Mason University, Fairfax, Virginia

1989 - Master's of Science in Computer Science
1991 The George Washington University, Washington, DC.

1981 - Bachelor's of Science in Computer Science
1983 University of Massachusetts, Amherst, Massachusetts

1979 - Brandeis University, Waltham, Massachusetts
1981

TEACHING EXPERIENCE

2008 – Department of Cognitive Science,
Present University of California, Irvine
Courses taught:
Cognitive Neuroscience
Cognitive Robotics
Computational Neuroscience
Perceptual Neuroscience

1997 - Assistant Professor
1999 Bioinformatics, Computational Neuroscience
Department of Computational Science and Informatics

George Mason University, Fairfax, Virginia

Courses taught:

Bioinformatics

Computational Neuroscience Systems

1990 - Graduate Teaching Assistant
1991 Senior Microprocessor Laboratory
Department of Electrical Engineering and Computer Science
George Washington University, Washington, D.C.

1989 - Graduate Teaching Assistant
1990 Senior Computer Project Laboratory
Department of Electrical Engineering and Computer Science
George Washington University, Washington, D.C.

EMPLOYMENT

2008 - Associate Professor
Present Department of Cognitive Sciences
Department of Computer Science
University of California, Irvine
Irvine, CA

1999 - Senior Fellow
2007 Theoretical Neurobiology
The Neurosciences Institute
San Diego, CA

1999- Consultant
2003 Generation and Description of Dendritic Morphology
Human Brain Project / Neuroinformatics Research Grant
National Institute of Neurological Disorders and Stroke /
National Institute of Mental Health
Grant Number: R01-NS39600-01

1996 - Research Professor
1999 Krasnow Institute for Advanced Study
George Mason University
Fairfax, VA

1997 - Assistant Professor
1999 Department of Computational Science and Informatics
George Mason University, Fairfax, VA

1994 - Chief Scientist
1999 Fatigue and Drug Detection - Oculomotor Measurements

Eye Tracking Software Development
Fitness Impairment Testing
Pulse Medical Instruments, Incorporated, Rockville, MD

- 1997 - Consultant
1999 Police Executive Research Forum
U.S. Department of Justice's National Institute of Justice
Grant Number: 96-IJ-CS-0046
- 1993 - Software Engineer
1994 System Services Software
FAA Air Traffic Control Advanced Automation System
Loral Corporation, Rockville, MD
- 1991 - Software Engineer
1993 System Services Common Code Software
FAA Air Traffic Control Advanced Automation System
IBM Corporation - Federal Systems Company, Rockville, MD
- 1989 Software Engineer
Infrared guided Missile Seeker software.
Raytheon Corporation, Bedford, MA
- 1988 - Consultant to Japanese Defense Army
1989 Command and Control software for the PATRIOT Missile System
Mitsubishi Heavy Industries, Nagoya, Japan
- 1984 - Software Engineer
1989 Training and Simulation software for the PATRIOT Missile system.
Infrared guided Missile Seeker software.
Communications software for the PATRIOT Missile system
Input/Output Processor software for Continuous Wave Radar
Raytheon Corporation, Bedford, MA

PUBLICATIONS

Reprints of publications can be found at: <http://www.socsci.uci.edu/~jkrichma/publications.html>

EDITED BOOKS

1. Krichmar, J.L., and Wagatsuma, H., eds. (2011). *Neuromorphic and Brain-Based Robots* (Cambridge University Press).

JOURNAL ARTICLES

1. Avery, M.C., Nitz, D.A., Chiba, A.A., and Krichmar, J.L. (2012). Simulation of Cholinergic and Noradrenergic Modulation of Behavior in Uncertain Environments. *Frontiers in Computational Neuroscience* 6, 1-16.
2. Richert, M., Nageswaran, J.M., Dutt, N., and Krichmar, J.L. (2011). An efficient simulation environment for modeling large-scale cortical processing. *Frontiers in Neuroinformatics* 5, 1-15.
3. Cox, B.R., and Krichmar, J.L. (2009). Neuromodulation as a Robot Controller: A Brain Inspired Design Strategy for Controlling Autonomous Robots. *IEEE Robotics & Automation Magazine* 16, 72-80.
4. Browne, W., Kawamura, K., Krichmar, J., Harwin, W., and Wagatsuma, H. (2009). Cognitive robotics: new insights into robot and human intelligence by reverse engineering brain functions. *IEEE Robotics and Automation Magazine* 16, 17-18.
5. Nageswaran, J.M., Dutt, N., Krichmar, J.L., Nicolau, A., and Veidenbaum, A.V. (2009). A configurable simulation environment for the efficient simulation of large-scale spiking neural networks on graphics processors. *Neural Networks* 22, 791-800.
6. Krichmar, J.L. (2008). The Neuromodulatory System – A Framework for Survival and Adaptive Behavior in a Challenging World. *Adaptive Behavior*, 16, 385-399.
7. McKinstry, J.L., Seth, A.K., Edelman, G.M., and Krichmar, J.L. (2008). Embodied Models of Delayed Neural Responses: Spatiotemporal Categorization and Predictive Motor Control in Brain Based Devices. *Neural Networks* 21, 553–561.
8. Albus, J.S., Bekey, G.A., Holland, J.H., Kanwisher, N.G., Krichmar, J.L., Mishkin, M., Modha, D.S., Raichle, M.E., Shepherd, G.M., and Tononi, G. (2007). A proposal for a Decade of the Mind initiative. *Science* 317, 1321.
9. Fleischer, J.G., and Krichmar, J.L. (2007). Sensory integration and remapping in a model of the medial temporal lobe during maze navigation by a brain-based device. *J Integr Neurosci* 6, 403-431.
10. Fleischer, J. G., Gally, J. A., Edelman, G. M., and Krichmar, J. L. (2007). *Retrospective and prospective responses arising in a modeled hippocampus during maze navigation by a brain-based device*. *Proc Natl Acad Sci USA*, 104, 3556-3561.
11. Krichmar, J. L., Velasquez, D., and Ascoli, G. A. (2006). *Effects of Beta-Catenin On Dendritic Morphology and Simulated Firing Patterns in Cultured Hippocampal Neurons*. *Biological Bulletin*, 211:31-43.
12. McKinstry, J. L., Edelman, G. M., and Krichmar, J. L. (2006). *A cerebellar model for predictive motor control tested in a brain-based device*. *Proc Natl Acad Sci USA*, 103, 3387-3392.

13. Krichmar, J. L., Seth, A. K., Nitz, D. A., Fleischer, J. G., and Edelman, G. M. (2005) *Spatial navigation and causal analysis in a brain-based device having detailed cortical-hippocampal interactions*. *Neuroinformatics*, 3: 197-222.
14. Seth, A. K., Sporns, O., and Krichmar, J. L. (2005) *Neurorobotic Models in Neuroscience and Neuroinformatics*. *Neuroinformatics*, 3: 167-170.
15. Krichmar, J. L., Nitz, D. A., Gally, J. A., and Edelman, G. M. (2005) *Characterizing functional hippocampal pathways in a brain-based device as it solves a spatial memory task*. *Proceedings of the National Academy of Sciences USA*, 2005: 102, 2111-2116.
16. Krichmar, J.L. and G.M. Edelman, (2005) *Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines*. *Artificial Life*, 11(1-2): p. 63-78.
17. Rowland, L. M., Thomas, M. L., Thorne, D. R., Sing, H. C., Krichmar, J. L., Davis, H. Q., Balwinski, S. M., Peters, R. D., Kloeppel-Wagner, E., Redmond, D. P., Alicandri, E. Belenky, G.. (2005). *Oculomotor responses during partial and total sleep deprivation*. *Aviat Space Environ Med* 76, C104-113.
18. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Visual binding through reentrant connectivity and dynamic synchronization in a brain-based device*. *Cerebral Cortex*, 2004: 14:11 p. 1185-1199.
19. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Active sensing of visual and tactile stimuli by brain-based devices*. *International Journal of Robotics and Automation*, 2004: 19:4, p. 222-238.
20. Russo, M., M. Thomas, D. Thorne, H. Sing, D. Redmond, L. Rowland, D. Johnson, S. Hall, J. Krichmar, and T. Balkin, *Oculomotor impairment during chronic partial sleep deprivation*. *Clin Neurophysiol*, 2003. **114**(4): p. 723-36.
21. Krichmar, J.L. and G.M. Edelman, *Machine Psychology: Autonomous Behavior, Perceptual Categorization, and Conditioning in a Brain-Based Device*. *Cerebral Cortex*, 2002. **12**: p. 818-830.
22. Krichmar, J.L., S.N. Nasuto, R. Scorcioni, S.D. Washington, and G.A. Ascoli, *Effects of Dendritic Morphology on CA3 Pyramidal Cell Electrophysiology: A Simulation Study*. *Brain Research*, 2002. **941**: p. 11-28.
23. Ascoli, G.A., J.L. Krichmar, S.J. Nasuto, and S.L. Senft, *Generation, description and storage of dendritic morphology data*. *Philos Trans R Soc Lond B Biol Sci*, 2001. **356**(1412): p. 1131-45.
24. Ascoli, G.A., J.L. Krichmar, R. Scorcioni, S.J. Nasuto, and S.L. Senft, *Computer generation and quantitative morphometric analysis of virtual neurons*. *Anat Embryol*, 2001. **204**: p. 283-301.
25. Krichmar, J.L., *Evolving Intelligent Robots: review of "Evolutionary Robotics: The biology, Intelligence, And Technology of Self-Organizing Machines" by S. Nolfi and D. Floreano*. *Complexity*, 2001. **6**(3): p. 51-53.
26. Nasuto, S.J., R. Knape, R. Scorcioni, J.L. Krichmar, and G.A. Ascoli, *Relation between neuronal morphology and electrophysiology in the Kainate lesion model of Alzheimer's Disease*. *Neurocomputing*, 2001. **38-40**: p. 1477-1487.
27. Nasuto, S.J., R. Scorcioni, J.L. Krichmar, and G.A. Ascoli, *Algorithmic statistical analysis of electrophysiological data for the investigation of structure-activity relationship in single neurons*. *InterJournal of Complex Systems*, 2001. **Report 389**.

28. Ascoli, G.A. and J.L. Krichmar, *L-neuron: A modeling tool for the efficient generation and parsimonious description of dendritic morphology*. Neurocomputing, 2000. **32-33**: p. 1003-1011.
29. Washington, S.D., G.A. Ascoli, and J.L. Krichmar, *A statistical analysis of dendritic morphology's effect on neuron electrophysiology of CA3 pyramidal cells*. Neurocomputing, 2000. **32-33**: p. 261-269.
30. Krichmar, J.L., *Review of "Neuronal Ensembles: Strategies for Recording and Decoding."*, Eichenbaum, H.B., Davis, J.L. (Eds). Quarterly Review of Biology, 1999. **74**(2).
31. Krichmar, J.L., K.T. Blackwell, G.S. Barbour, A.B. Golovan, and T.P. Vogl, *A Solution to the Feature Correspondence Problem Inspired by Visual Scanpaths*. Neurocomputing, 1999. **26-27**: p. 769-778.
32. Krichmar, J.L., G.A. Ascoli, L. Hunter, and J.L. Olds, *A Model of Cerebellar Saccadic Motor Learning using Qualitative Reasoning*. Lecture Notes in Computer Science, Artificial and Natural Neural Networks, 1997. **1240**: p. 134-145.

CONFERENCE PROCEEDINGS

1. Avery, M., Krichmar, J.L., and Dutt, N. (2012). Spiking Neuron Model of Basal Forebrain Enhancement of Visual Attention. Paper to be presented at: International Joint Conference on Neural Networks (Brisbane, Australia).
2. Krichmar, J.L. (2012). A Biologically Inspired Action Selection Algorithm Based on Principles of Neuromodulation. Paper to be presented at: International Joint Conference on Neural Networks (Brisbane, Australia).
3. Krichmar, J.L., Dutt, N., Nageswaran, J.M., and Richert, M. (2011). Neuromorphic Modeling Abstractions and Simulation of Large-Scale Cortical Networks. Paper presented at: IEEE/ACM International Conference on Computer-Aided Design (ICCAD) (San Jose, CA).
4. Krichmar, J.L., and Wagatsuma, H. (2011). Neuromorphic and Brain-Based Robots. In Biologically Inspired Cognitive Architectures, A.V. Samsonovich, and K.R. Jóhannsdóttir, eds. (IOS Press), pp. 209-214.
5. Moorkanikara Nageswaran, J., Richert, M., Dutt, N., and Krichmar, J.L. (2010). Towards Reverse Engineering The Brain: Modeling Abstractions and Simulation Frameworks. In 18th IEEE/IFIP International Conference on VLSI and System on Chip (VLSI-SOC) (Madrid, Spain, IEEE Explore).
6. Asher, D.E., Zaldivar, A., and Krichmar, J.L. (2010). Effect of Neuromodulation on Performance in Game Playing: A Modeling Study. Paper presented at: International Conference on Development and Learning (Ann Arbor, Michigan, IEEE Xplore).
7. Zaldivar, A., Asher, D.E., and Krichmar, J.L. (2010). Simulation of How Neuromodulation Influences Cooperative Behavior Paper presented at: Simulation of Adaptive Behavior: From Animals to Animats (Paris, France, Springer Lecture Notes on Artificial Intelligence).

8. Moorkanikara Nageswaran, J., Dutt, N., Krichmar, J.L., Nicolau, A., and Veidenbaum, A. (2009). "Efficient Simulation of Large-Scale Spiking Neural Networks Using CUDA Graphics Processors." Paper presented at: IJCNN (Atlanta, GA).
9. Krichmar J.L. (2008), Neuromodulation and Time-Dependent Plasticity in a Model of Foraging Behavior, IEEE 7th International Conference on Development and Learning, Monterey, CA.
10. Krichmar, J.L., and Edelman, G.M. (2007). Design Principles and Constraints Underlying the Construction of Brain-Based Devices. In Lecture Notes in Computer Science: Neural Information Processing (Berlin, Springer-Verlag).
11. Krichmar, J. L., and Edelman, G. M. (2006). *Principles Underlying the Construction of Brain-Based Devices*, In Adaptation in Artificial and Biological Systems, T. Kovacs, and J. A. R. Marshall, eds. (Bristol UK: Society for the Study of Artificial Intelligence and the Simulation of Behaviour), pp. 37-42.
12. Fleischer, J.G., Szatmary, B., Hutson, D., Moore, D.A., Snook, J.A., Edelman, G.M., and Krichmar, J.L. (2006). *A neurally controlled robot competes and cooperates with humans in Segway soccer*, IEEE International Conference on Robotics and Automation (Orlando, FL).
13. Krichmar, J.L., D.A. Nitz, and G.M. Edelman. *Object recognition, Adaptive Behavior and Learning in Brain-Based Devices*. in *Third International Conference on Development and Learning*. 2004. La Jolla, CA.
14. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Texture discrimination by an autonomous mobile brain-based device with whiskers*, in *IEEE International Conference on Robotics and Automation*. 2004: New Orleans, LA. p. 4925-4930.
15. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Spatiotemporal processing of whisker input supports texture discrimination by a brain-based device*, in *Animals to Animats 8: Proceedings of the Eighth International Conference on the Simulation of Adaptive Behavior*, S. Schaal, A. Ijspeert, A. Billard, S. Vijayakumar, J. Hallam, and J.A. Meyer, Editors. 2004, The MIT Press: Cambridge, MA.
16. Krichmar, J.L. and G.M. Edelman, *Brain-Based Devices: Intelligent Systems Based on Principles of the Nervous System*, in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2003: Las Vegas, NV. p. 940-945.
17. Krichmar, J.L. and J.A. Snook, *A neural approach to adaptive behavior and multi-sensor action selection in a mobile device*, in *IEEE Conference on Robotics and Automation*. 2002: Washington, D.C. p. 3864-3869.
18. Nasuto, S.J., R. Scorcioni, J.L. Krichmar, and G.A. Ascoli, *Algorithmic statistical analysis of electrophysiological data for the investigation of structure-activity relationship in single neurons*. InterJournal of Complex Systems, 2001. **Report 389**.
19. Krichmar, J.L., J.A. Snook, G.M. Edelman, and O. Sporns, *Experience-dependent Perceptual Categorization in a Behaving Real-World Device*, in *Animals to Animats 6: Proceedings of the Sixth International Conference on the Simulation of Adaptive Behavior*, J.-A. Meyer, A. Berthoz, D. Floreano, H. Roitblat, and S.W. Wilson, Editors. 2000, A Bradford Book. The MIT Press: Cambridge, MA. p. 41-50.

20. Symanzik, J., G.A. Ascoli, S.D. Washington, and J.L. Krichmar, *Visual Data Mining of Brain Cells*. Computing Science and Statistics, 1999. **31**: p. 445-449.
21. Krichmar, J.L., G.A. Ascoli, L. Hunter, and J.L. Olds, *Qualitative reasoning as a modeling tool for computational neuroscience*, in *Computational Neuroscience: Trends in Research*, J.M. Bower, Editor. 1998, Plenum Press: New York.
22. Vandersluis, J.P., J.D. Cooke, G.A. Ascoli, J.L. Krichmar, G.S. Michaels, M. Montgomery, J. Symanzik, and B. Vitucci, *Exploratory Statistical Graphics for an Initial Motion Control Experiment*. Computing Science and Statistics, 1998. **30**: p. 482-487.
23. Hunter, L., J.L. Krichmar, and J.L. Olds. *Qualitative reasoning as a tool for computational neuroscience*. in *Proceedings of the 11th International Workshop on Qualitative Reasoning*. 1997. Pavia, Italy: Istituto di Analisi Numerica C.N.R.
24. Krichmar, J.L., *Qualitative Reasoning in Neural Modeling: Hodgkin-Huxley Revisited*, in *Intelligent Engineering Through Artificial Neural Networks*, C.H. Dagli, F. B.R., G. J., and K. R.T., Editors. 1994, ASME Press: New York. p. 567-572.
25. Greene, H.J. and J.L. Krichmar, *A Case Study in Data Management in the Air Traffic Control Advanced Automation System*, in *Studies in Computer and Communications Systems*, W.J. Taylor, Editor. 1992, IOS Press: London. p. 85-103.

BOOK CHAPTERS

1. Krichmar, J. L., and Reeke, G. N. (2005). The Darwin Brain-Based Automata: Synthetic Neural Models and Real-World Devices, In *Modeling in the Neurosciences: From Biological Systems to Neuromimetic Robotics*, G. N. Reeke, R. R. Poznanski, K. A. Lindsay, J. R. Rosenberg, and O. Sporns, eds. (Boca Raton: Taylor & Francis), pp. 613-638.
2. Krichmar, J.L. and S.J. Nasuto, *The relationship between neuronal shape and neuronal activity*, in *Computational Neuroanatomy: Principles and Methods*, G.A. Ascoli, Editor. 2002, Humana Press Inc. p. 105-125.

PATENTS

1. Snook, J.A., Hutson, D.B., Krichmar, J.L., “Special purpose processor implementing a synthetic neural model of the human brain”, 8,126,828, 2/28/12.
2. Fleischer, J.G., Szatmary, B., Hutson, D.B., Moore, D.A., Snook, J.A., Edelman, G.M., Krichmar, J.L., “Hybrid Control Device”, 7,765,029, 7/27/10.
3. Snook, J.A., Hutson, D.B., Krichmar, J.L., “Neural Modeling and Brain-Based Devices Using Special Purpose Processor”, 7,533,071, 5/12/09.
4. Edelman, G.M, Krichmar, J.L., Nitz, D.A., “Mobile brain-based device having a simulated nervous system based on the hippocampus”, Patent Number: 7,467,115, Issue Date: 12/16/2008.

5. Seth, A.K. McKinstry, J.L., Edelman, G.M., Krichmar, J.L., “Mobile brain-based device for use in a real world environment”, 7,519,452, Issue Date: 4/14/2009.
6. McKinstry, J.L., Edelman; G.M., Krichmar, J.L., “Brain-based device having a cerebellar model for predictive motor control”, 7,827,124, Issue Date: November 2, 2010.
7. Rafal, M., Krichmar, J.L., Starin, E., “Pupil Detection System.”, Patent Number: 5610673, Issue Date: 3/11/1997.

INVITED TALKS

1. Neuromorphic Modeling Abstractions and Simulation of Large-Scale Cortical Networks. IEEE/ACM International Conference on Computer-Aided Design (ICCAD), San Jose, CA, November 2011.
2. “Neuromorphic and Brain-Based Robots”, International Conference on Biologically Inspired Cognitive Architectures, Washington, DC, November 2011.
3. “Neuromodulation as a Brain-Inspired Strategy for Controlling Autonomous Robots and a Means to Investigate Social Cognition during Human-Robot Interactions”, Dynamics of Brain-Body-Environment Systems colloquium, Indiana University, Bloomington, IN, October 2011.
4. “Understanding Cognition Through Building Brain-Inspired Robots”, INSIDE UCI Series, Summer Session 2011, University of California, Irvine, August, 2011.
5. "Computational Approaches in Cognitive Neuroscience: Case studies in neurobotics and large-scale cortical modeling", National Brain Research Centre, Manesar, Haryana, India, July 2011.
6. “Computational Approaches in Cognitive Neuroscience”, Brain and Cognition Workshop, The Centre for Neuroscience, Indian Institute of Science, Bangalore, India, July, 2011.
7. “Building Brain-Inspired Robots (SC 215)”, Osher Life Long Learning Institute, Irvine, CA, December 2010.
8. “Understanding Cognition through Building Brain-Inspired Robots”, The Inside Edge Foundation for Education, Irvine, CA, November 2010.
9. “Effect of Neuromodulation on Human-Robot Interactions and Game Playing”, Electrical Engineering and Computer Science Technical Seminar Series, University of California, Merced, October 2010.
10. “Effect of Neuromodulation on Cooperative Behavior: A Human-Neurobot Interaction Study”, at the Beyond Brain Machine Interfaces workshop, 2010 Neural Interfaces Conference, Long Beach, CA, June 2010.
11. “Understanding Cognition through Building Brain Inspired Robots” at the Chief Executive Roundtable Retreat, Cavallo Point in Sausalito, California, May 2010.
12. “Neurobotics and Modeling Cognitive Function” at the Expert Speaker Series for the School of Social Sciences, University of California, Irvine, February 2010.
13. “Neurobotics and Modeling Cognitive Function” at the Chancellor’s Club, University of California, Irvine, October 2009.

14. "Using neurally inspired robots to study brain function: Principles and mechanisms" at the Artificial Intelligence Laboratory, University of Zurich, Zurich, Switzerland, September 2009.
15. "Using neurally inspired robots to study brain function: Principles and mechanisms" at the Laboratory of Intelligent Systems, Ecole Polytechnique Federal de Lausanne, Lausanne, Switzerland, August 2009.
16. "Using neurally inspired robots to study brain function: Principles and mechanisms" at the symposium on *Models of vision and decision-making: From features to behavior and perceptual robotics* in the 32nd European Conference on Visual Perception (ECVP'09), Regensburg, Germany, August 2009.
17. "Neurorobotics, Brain-Based Devices, and Modeling Cognitive Function", Nour Foundation-Georgetown University Symposium on The Paradox of Neurotechnology, Georgetown University, Washington, DC, May 2009.
18. "Neurorobotics, Neuromodulation, and Modeling Cognitive Function", Sloan-Swartz Center for Theoretical Neurobiology at the Salk Institute, La Jolla, CA, April 2009.
19. "Cognitive Robotics: Studying Cognitive Functions with Embodied Models of the Nervous System", at the Artificial Intelligence and Machine Learning Seminar, Center for Machine Learning and Artificial Intelligence, University of California, Irvine, January 2009.
20. "Neurorobotics and Modeling Cognitive Function" at the Decade of the Mind IV Conference, Santa Ana Pueblo, NM, January 2009.
21. "Cognitive Robotics: Studying Cognitive Functions with Embodied Models of the Nervous System", at the Brain and Technology Summer School, Barcelona, Spain, September 2008.
22. "Neuromodulation and Time-Dependent Plasticity in a Model of Foraging Behavior", *15th Annual Joint Symposium on Neural Computation*, University of California, Irvine, May 2008.
23. "Design Principles and Constraints Underlying the Construction of Brain-Based Devices", RIKEN Brain Science Institute, Saitama, Japan, November 19, 2007.
24. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", Mechanical and Aerospace Engineering Department, Cornell University, Ithaca, NY, October 2007.
25. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", at the College of Architecture, Art, and Planning, Cornell University, Ithaca, NY, October 2007.
26. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", at Hughes Research Laboratories, Malibu, CA, September 2007.
27. Brain-based Devices: Studying Cognitive Functions with Embodied Models of the Nervous System, euCognition the European Network for the Advancement of Artificial Cognitive Systems' Third Six-Monthly Meeting, Munich Airport, 29 June 2007.

28. "Computational Neuroscience", at the Workshop in Cognitive Neuroscience. Centros de Neurociencias de Cuba, Havana Cuba, June 4-8, 2007.
29. "Brain-based Devices: Studying brain function by developing embodied models of the nervous system", at the Center for Intelligent Systems, Vanderbilt University, April 2007.
30. "Causal Analysis of Large-Scale Embodied Models of the Hippocampus and Cerebellum: Tracing Back Through Time" at the Interdisciplinary Program in Neuroscience Seminar at Georgetown University, November 2006
31. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Applied Neural Computing workshop, Engineering and Medicine in Biology Conference (EMBC), August 2006, New York, NY.
32. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Cognitive Robotics, Intelligence, and Control (CogRIC) workshop, August 2006, Windsor, UK.
33. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Orange County IEEE/ACM Society chapter meeting, July 2006, Irvine, CA.
34. "The Brain as a Complex System: Tools to Analyze Simulated and Real Nervous Systems", by Jeffrey Krichmar at the DARPA Complex Systems Architectures Workshop, Arlington, Virginia, June 2006.
35. "Analysis of Large-Scale Embodied Neural Models by Tracing Back Through Time", by Jeffrey Krichmar at the Artificial Life conference workshop on *Neurodynamic Methods for analysis and control of cognitive behaviors*, Bloomington, Indiana, June 2006.
36. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Adaptation in Artificial and Biological Systems symposium on "GC5: Architecture of Brain and Mind," Bristol UK, April 2006
37. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the California State Summer School at University of California at San Diego, July 2005.
38. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the Robotics/Computer/Computational Intelligence Societies Chapter Meeting, San Diego, CA, May 2005.
39. "Characterizing Hippocampal Pathways in a Brain-Based Device during a Spatial Memory Task", by Jeffrey Krichmar at the *Ninth International Conference On Cognitive And Neural Systems* in Boston, May 2005.
40. "Object recognition, Adaptive Behavior and Learning in Brain-Based Devices" presented by Jeffrey Krichmar at the *Third International Conference on Development and Learning* in La Jolla, CA, October 2004.
41. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", presented by Jeffrey Krichmar at the *Potomac Institute for Policy Studies* in Washington, DC, September 2004.

42. "Engineering of brain-based devices", presented by Jeffrey Krichmar at the *Information Science and Technology Study Group* in Woods Hole, MA, August 2004.
43. "Spatial and Episodic Memory in a Real-World Device Containing a Model of Hippocampal-Cortical Interactions", presented by Jeffrey Krichmar at the *Neurorobotic Models in Neuroscience and Neuroinformatics* workshop in Los Angeles, CA, July 2004.
44. "Texture discrimination by an autonomous mobile brain-based device with whiskers", presented by Jeffrey Krichmar at the *IEEE International Conference on Robotics and Automation* in New Orleans, LA, April 2004.
45. "Brain-Based Devices: Studying the Nervous System and Developing Intelligent Machines Based on Neurobiological Principles", by Jeffrey Krichmar at the *Mobile Autonomous Robot Software (MARS) PI Meeting* in New Orleans LA, April, 2004.
46. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the *Augmented Cognition PI Meeting* in Orlando FL, January, 2004.
47. "Visual Binding Through Reentrant Connectivity And Synchronization In A Brain-Based Device", by Jeffrey Krichmar at the *Seventh International Conference On Cognitive And Neural Systems* in Boston, May 2003.
48. "Machine Psychology: Autonomous behavior, perceptual categorization, and conditioning in a brain-based device", by Jeffrey Krichmar at the *International Interdisciplinary Seminar On New Robotics, Evolution And Embodied Cognition* in Lisbon, Portugal. November 2002.
49. "Machine Psychology: Experience-Dependent Perceptual Categorization and Learning in a Brain-Based Device, by Jeffrey Krichmar at the "Experience and Developing Brain Symposium" at the Jean Piaget Society Annual Meeting in Philadelphia, PA. June 2002.
50. "A Neural Approach to Adaptive Behavior and Multi-Sensor Action Selection in a Mobile Device", presented by Jeffrey Krichmar at the 2002 IEEE International Conference on Robotics & Automation, Washington, DC. May 2002.
51. "Categorization And Value Systems As A Means Toward Action Selection In A Brain-Based Device", by J. Krichmar at the Modulation and Modification of Sensor-Motor Coupling workshop in Stirling U.K. February 2002.
52. "Categorization And Value Systems As A Means Toward Action Selection In A Brain-Based Device", by J. Krichmar at the Department of Cybernetic, Reading University, Reading U.K. February 2002.
53. "Visual and Auditory Categorization In A Behaving Real-World Device", by J. Krichmar at the Workshop on Visual and Auditory Categorization In A Behaving Real-World Device, IEEE International Symposium on Computational Intelligence in Robotics and Automation, Banff, Alberta, Canada. July 2001.
54. "Machine psychology: Studying behavior and the brain with devices that explore a real world environment" by J. Krichmar at the Krasnow Institute for Advanced Study at George Mason University, Fairfax, VA. April 2001.

55. "Brain-Based Devices: Studying Behavior and the Nervous System with Devices that Explore a Real World Environment", by J. Krichmar at the 68th Meeting of the Neurosciences Research Program, The Neurosciences Institute, San Diego, CA. March 2001.
56. "Experience-dependent Perceptual Categorization in a Behaving Real-World Device", by J. Krichmar at the Sixth International Conference on Simulation of Adaptive Behavior, Paris, France. September 2000.
57. "The Need for Computational Neuroanatomy: Neuromorphology's Shaping of Neurophysiology.", Computational Neuroanatomy Symposium: Experimental Biology Meeting, April 2000, San Diego, CA.
58. "Oculomotor Indicators of Fatigue and Impairment.", Psychophysiology in Ergonomics Symposium: ANS and CNS Indices of Attention, Workload, and Fatigue. 38th Annual Meeting of the Society for Psychophysiological Research, 1998.
59. "Hippocampus – Larger than Life: Constructing a Large-Scale Model", April 1998, Laboratory of Neural Control, NINDS, National Institute of Health, Washington, DC.
60. "Hippocampus – Larger than Life: Constructing a Large-Scale Model.", February 1998, Krasnow Institute for Advanced Study, George Mason University, Fairfax, VA.
61. "Qualitative reasoning as a modeling tool for computational neuroscience.", June 1997, Mathematical Branch, NIDDK, National Institute of Health, Washington, DC.

RESEARCH INTERESTS

Autonomous Robots

Neuro-robotics

Machine psychology: Understanding the brain by using real-world behaving devices.

Biologically plausible computer models of learning and memory.

Large-scale computational models of the hippocampus and cerebellum.

Motor control in the oculomotor system.

Fatigue and drug detection.

FUNDING

W.M. Keck Foundation

Defense Advance Research Projects Agency (DARPA)

Office of Naval Research

National Science Foundation

WORKSHOPS AND MEETINGS ORGANIZED

Co-Organizer of the *15th Annual Joint Symposium on Neural Computation*, University of California, Irvine, May 2008.

Co-Organizer of *Brain-style Robotics: Trends and Perspectives* at The 14th International Conference on Neural Information Processing, Kitakyushu Japan, November 2007.

Organizing committee of the International Workshop on Cognitive Robotics, Intelligence and Control (CogRIC) in Windsor UK, August 2006.

Co-chair of the Segway League at the RoboCup US Open in Atlanta, GA, May 2005.

Co-Organized the *Neurobotic Models in Neuroscience and Neuroinformatics* workshop at the Eighth International Conference on the Simulation of Adaptive Behavior in Los Angeles, CA, July 2004.

PROGRAM COMMITTEES

External Review Panel, Sandia National Laboratories.

Chairman, Decade of the Mind Initiative Steering Committee.

7th International Conference on Development and Learning (ICDL-08).

Area Chair, 8th International Conference on Development and Learning (ICDL-09).

SAB 2008 - Simulation of Adaptive Behavior 2008.

ECAL2007 - 9th European Conference on Artificial Life.

EDITING AND REVIEWING

Academic Editor, *PLOS One*.

Academic Editor, *IEEE Transactions on Autonomous Mental Development*.

Academic Editor, *International Journal of Humanoid Robotics*

Academic Editor, *Frontiers in Neurorobotics*

Action Editor, *Neural Networks*

Guest Editor, Special Issue on Cognitive Robotics in *IEEE Robotics and Automation Magazine*. 2009.

Editor, Special issue of the journal *Neuroinformatics* on “Neurobotic Models in Neuroscience and Neuroinformatics, Fall 2005.

Reviewer, *Adaptive Behavior*.

Reviewer, *Artificial Life*.

Reviewer, *Cognitive Systems Research*

Reviewer, *Frontiers in Neural Circuits*

Reviewer, *Frontiers in Neuroinformatics*

Reviewer, *Hippocampus*

Reviewer, *IEEE Computational Intelligence*.

Reviewer, *IEEE Transactions on Neural Networks*.

Reviewer, *Journal of Cognitive Neuroscience*

Reviewer, *Journal of Integrative Neuroscience*

Reviewer, *Neurocomputing*.

Reviewer, *Neural Networks*.

Reviewer, *Public Library of Science (PLOS)*

Reviewer, *Public Library of Science (PLOS) Computational Biology*

COMMUNITY SERVICE

- 2011 Mathobotix
- 2009 Chancellors Club – University of California, Irvine
- 2009 Falmagne Award Committee
- 2008 Robotics Club, Torrey Hills School
- 2008 California Forum for Diversity in Graduate Education
- 2004-2011 FIRST Lego League Robotics. Awarded for outstanding service as a volunteer.
- 2003-2009 *Expanding Your Horizons (EYH) Conference* at the University of California, San Diego (UCSD). Ran workshops on Robotics and Learning to increase the interest of young women in math and science through fun, hands-on learning opportunities.
- 2002-2007 *Botball Robotics Mentor/Judge* - a hands-on learning experience in robotics designed to engage students in learning the practical applications of science, technology, engineering and math.
- 2007 Rancho Santa Fe Discovery Day
- 2006 California State 4-H Leadership Conference, Ran workshop on robotics.
- 2005-2009 California State Summer School for Mathematics and Science (COSMOS)
- 2005 Community Day, La Jolla Country Day School.
- 2004-2006 San Diego Science Alliance RoboExpo – Demonstrated Brain-Based Robotics to Junior High School and High School students and teachers.

SOCIETIES

- 2011 - Present Biologically Inspired Cognitive Architectures (BICA) Society
- 1994 - Present Society for Neuroscience

1996 - Association for Research in Vision and Ophthalmology
1999

2000 - Society for Adaptive Behavior
Present

2000 - IEEE Robotics and Automation
Present

HONORS AND AWARDS

1979-80 Varsity Letters in Cross Country, Indoor Track and Outdoor Track
1983 Dean's List
1990 Passed Comprehensive Examination with Distinction
1990 3.7 GPA at The George Washington University
1996 Passed Ph.D. Candidacy Examination in Computational Sciences and Informatics at George Mason University
1997 3.9 GPA at George Mason University
1998 President, Potomac Chapter of the Society for Neuroscience