Javier R. Movellan

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Javier R. Movellan is an associate project professor at UCSD's Institute for Neural Computation. Javier founded UCSD's Machine Perception Laboratory in 1997 to pursue David Marr's functional approach to the study of the brain. The goal is to gain insights about the way the brain works by clarifying the nature of the problems it solves. The problems have to be specific enough to avoid sterile thoeretical debates. The solutions have to work in natural environments, not just laboratory conditions, to avoid relying on tricks that inform little about the brain. The lab focuses on the problem of real-time interaction with human beings. We ground the theoretical analysis of these problems on optimal probabilistic inference and control. The solutions are implemented as machine perception primitives to enable interaction with human beings in natural conditions. Javier founded the Kolmogorov project that provides a collection of open source software and tutorials on topics related to Machine Learning, Machine Perception and Statistics (http://kolmogorov.sourceforge.net).

EDUCATION

Fulbright Scholar			1984-1989.
Ph.D.	Psychology	U.C. Berkeley	1984-1989.
Licenciatura	Psychology	Univ. Madrid (Spain)	1978-1983.

ACADEMIC APPOINTMENTS

Full Project Scientist	UCSD	2003-present.
Visiting Research Scientist	ATR	Japan, 2002
Associate Project Scientist	UCSD	2001-2003.
Assistant Professor	UCSD	1993-2001.
Research Associate	CMU	1989-1993.

RESEARCH INTERESTS

- Functional Approaches to the Study of the Brain
- Machine Perception and Machine Learning
- Robotics

RECENT PUBLICATIONS

[1] G. Littlewort, M.S. Bartlett, I. Fasel, J. Susskind, and J.R. Movellan. Dynamics of facial expression extracted automatically from video. In *IEEE Conference on Computer Vision and Pattern Recognition, Workshop on Face Processing in Video*, 2004. Click here for Web version (pdf).

[2] M.S. Bartlett, G. Littlewort, C. Lainscsek, I. Fasel, and J.R. Movellan. Machine learning methods for fully automatic recognition of facial expressions and facial actions. In *IEEE International Conference on Systems, Man & Cybernetics*, The Hague, Netherlands, October 2004. Click here for Web version (pdf).

[3] Takayuki Kanda, Nicolas Miralles, Masayuki Shiomi, Takahiro Miyashita, Ian Fasel, Javier R. Movellan, and Hiroshi Ishiguro. Face-to-face interactive humanoid robot. *IEEE 2004 International Conference on Robotics and Automation*, in press. Click here for Web version (pdf).

[4] Gwen Littlewort, Marian Stewart Bartlett, Ian Fasel, Joel Chenu, and Javier R. Movellan. Analysis of machine learning methods for real-time recognition of facial expressions from video. *Computer Vision and Pattern Recognition 2004 (Face Processing Workshop)*, CVPR Workshops. Click here for Web version (pdf).

[5] J. R. Movellan, J. Hershey, and Josh Susskind. Large scale convolutional HMMs for real time video tracking. *Computer Vision and Pattern Recognition 2004*, 2004. Click here for Web version (pdf).

[6] J. R. Movellan, J. Hershey, T. K. Marks, and C. Roddey. 3D tracking of morphable objects using conditionally gaussian non-linear filters. *CVPR Workshop Generative Models*, In Press. Click here for Web version (pdf).

[7] Ian Fasel, Bret Fortenberry, and J. R. Movellan. A generative framework for real-time object detection and classification. *Computer Vision and Image Understanding*, In Press. Click here for Web version (pdf).

[8] Odelia Schwartz, Javier R. Movellan, Thomas Wachtler, Thomas D, and Terrence J. Sejnowski. Spike count distributions, factorability, and contextual effects in area V1. In *Proceedigns Computational Neuroscience*. 2003. Click here for Web version (pdf).

[9] M. S. Bartlett, J. R. Movellan, G. Littlewort, B. Braathen, Frank M. G., and T. J. Sejnowski. Towards automatic recognition of spontaneous facial actions. In Paul Ekman, editor, *What the Face Reveals*. Oxford University Press, 2003. Click here for Web version (pdf).

[10] J. R. Movellan and M. S. Bartlett. The next generation of automatic facial expression measurement. In Paul Ekman, editor, *What the Face Reveals*. Oxford University Press, 2003. Click here for Web version (pdf).

[11] Ronald Cole, Sarel van Vuure, Bryan Pellom, Kadri Hacioglu, Jiyong Ma, Javier Movellan, Scott Schwartz, David Wade-Stein, Wayne Ward, and Jie Yang. Perceptive animated interfaces: First steps toward a new paradigm for human computer interaction. *Proceedings of the IEEE, Special Issue on Human Computer Interaction*, 91(9):1391–1405, 2003. Click here for Web version (pdf).

[12] G. Littlewort, M.S. Bartlett, Chenu J, I. Fasel, T. Kanda, H. Ishiguro, and J.R. Movellan. Towards social robots: Automatic evaluation of human-robot interaction by face detection and expression classification. In *Advances in neural information processing systems*, volume 16. MIT Press, Cambridge, MA, in press. Click here for Web version (pdf).

[13] M.S. Bartlett, G. Littlewort, I. Fasel, and J.R. Movellan. Real time face detection and expression recognition: Development and application to human-computer interaction. In *CVPR Workshop on Computer Vision and Pattern Recognition for Human-Computer Interaction*. 2003. Click here for Web version (pdf).

PATENTS

[1] Javier R. Movellan, Marian Stewart Bartlett, and Gwen Ford Littlewort. A method for automatic real time analysis of facial expressions. US Patent Application (joint UCSD/SONY application), 2003.

PREVIOUS PUBLICATIONS

[1] M. S. Bartlett, J. R. Movellan, and T. J. Sejnowski. Face recognition by independent component analysis. *IEEE transactions on neural networks*, 13(6):1450–1464, 2002. Click here for Web version (pdf).

[2] J. R. Movellan, T. Wachtler, T. D. Albright, and T. Sejnowski. Morton-style factorial coding of color in primary visual cortex. In *Advances in Neural Information Processing Systems*, number 15. MIT Press, Cambridge, Massachusetts, 2003. Click here for Web version (pdf).

[3] M. Stewart Bartlett, B. Braathen, , G. Littlewort, E. Smith, and J. R. Movellan. An approach to automatic recognition of spontaneous facial actions. In *Advances in Neural Information Processing Systems*, number 15. MIT Press, Cambridge, Massachusetts, 2003. Click here for Web version (pdf).

[4] I. Fasel and J. R. Movellan. Comparison of neurally inspired face detection algorithms. In *Proceedings of the international conference on artificial neural networks (ICANN 2002)*. UAM, 2002. Click here for Web version (pdf).

[5] I. Fasel M. Stewart-Bartlett G. Littelwort-Ford and J. R. Movellan. Real time fully automatic coding of facial expressions from video. In *Proceedings of the 9th Symposium on Neural Computation*. California Institute of Technology, May 2002.

[6] I. Fasel and J. R. Movellan. Object detection as a Markov decision process. In *Proceedings of the 9th Symposium on Neural Computation*. California Institute of Technology, May 2002.

[7] I. Fasel, G. O. Deak, J. Triesch, and J. R. Movellan. Combining embodied models and empirical research for understanding the development of shared attention. In *Proceedings of the second international conference on development and learning (ICDL02)*. MIT, 2002. Click here for Web version (pdf).

[8] J. R. Movellan and J. S. Watson. The development of gaze following as a Bayesian systems identification problem. In *Proceedings of the second international conference on development and learning (ICDL02)*. IEEE, 2002. Click here for Web version (pdf).

[9] I. R. Fasel, M. Stewart Bartlett, and J. R. Movellan. A comparison of Gabor filter methods for automatic detection of facial landmarks. In *Proceedings of the 5th International Conference on Automatic Face and Gesture Recognition*. Washington DC, 2002. Click here for Web version (pdf).

[10] G. O. Deak, I. R. Fasel, and J. R. Movellan. The emergence of shared attention: using robots to test developmental theories. In Balkenius, editor, *Proceedings of the first international workshop on epigenetic robotics: modeling cognitive development*, pages 95–104. Lund University Cognitive Studies, Lund, Sweden, 2001. Click here for Web version (pdf).

[11] J. D. Nelson, J. B. Tenenbaum, and J. R. Movellan. Active inference in concept learning. In *Proceedings of the 23rd Annual Conference of the Cognitive Science Society*, pages 692–697. LEA, Edinburgh, Scotland, 2001. Click here for Web version (pdf).

[12] J. R. Movellan, P. Mineiro, and R. J. Williams. A Monte-Carlo EM approach for partially observable diffusion processes: Theory and applications to neural networks. *Neural Computation*, 14(7):1507–1544, 2002. Click here for Web version (pdf).

[13] I. R. Fasel and J. R. Movellan. Meta analysis of neurally inspired face detection algorithms. In *Proceedings of the 8th Symposium on Neural Computation*. The Salk Institute for Biological Studies, May 2001.

[14] Tim K. Marks and Javier R. Movellan. Diffusion networks product of experts and factor analysis. In *Proceedings of the 3rd International Conference on Independent Component Analysis and Blind Signal Separation*. San Diego, California, December, 2001. Click here for Web version (pdf).

[15] J. R. Movellan and J. Nelson. Probabilistic functionalism: A unifying paradigm for the cognitive sciences. *Behavioral and Brain Sciences*, 24(4):690–692, 2001. Click here for Web version (pdf).

[16] J. R. Movellan and J. L. McClelland. The Morton-Massaro law of information integration: Implications for models of perception. *Psychological Review*, 108(1):113–148, 2001. Click here for Web version (pdf).

[17] M. S. Gray, T. J. Sejnowski, and J. R. Movellan. A comparison of image processing techniques for visual speech recognition applications. In T. Leen, T. G. Dietterich, and V. Tresp, editors, *Advances in Neural Information Processing Systems*, number 13, pages 939–945. MIT Press, Cambridge, Massachusetts, 2001. Click here for Web version (pdf).

[18] J. R. Movellan, P. Mineiro, and R. J. Williams. Partially observable SDE models for image sequence recognition tasks. In T. Leen, T. G. Dietterich, and V. Tresp, editors, *Advances in Neural Information Processing Systems*, number 13, pages 880–886. MIT Press, Cambridge, Massachusetts, 2001. Click here for Web version (pdf).

[19] J. D. Nelson and J. R. Movellan. Active inference in concept induction. In T. Leen, T. G. Dietterich, and V. Tresp, editors, *Advances in Neural Information Processing Systems*, number 13, pages 45–51. MIT Press, Cambridge, Massachusetts, 2001. Click here for Web version (pdf).

[20] I. R. Fasel, E. Smith, M. R. Bartlett, and J. R. Movellan. A comparison of Gabor filter methods for automatic detection of facial landmarks. In *Proceedings of the 7th Symposium on Neural Computation*. California Institute of Technology, 2000.

[21] B. Shpungin and J. R. Movellan. A multimodular approach to real-time face tracking. In *Proceedings of the 7th Symposium on Neural Computation*. California Institute of Technology, 2000.

[22] J. Hershey and J. R. Movellan. Audio-vision:using audio-visual correlation to locate sound sources. In S. A. Solla, T. K. Leen, and

K. R. Muller, editors, *Advances in Neural Information Processing Systems*, number 12, pages 813–819. MIT Press, Cambridge, Massachusetts, 2000. Click here for Web version (pdf).

[23] Movellan and McClelland. Information factorization in connectionist models of perception. In S. A. Solla, T. K. Leen, and K. R. Muller, editors, *Advances in Neural Information Processing Systems*, number 12, pages 45–51. MIT Press, Cambridge, Massachusetts, 2000. Click here for Web version (pdf).

[24] Bartlett, M, G. Donato, Movellan, J. R., J. Hager, P. Ekman, and T. Sejnowski. Image representations for facial action coding. In S. A. Solla, T. K. Leen, and K. R. Muller, editors, *Advances in Neural Information Processing Systems*, pages 886–892. MIT Press, Cambridge, Massachusetts, 2000. Click here for Web version (pdf).

[25] J. R. Movellan and J. McClelland. An analysis of the Morton-Massaro law and its consequences for models of perception. In *Proceedings of the 6th Symposium on Neural Computation*, pages 97–103. California Institute of Technology, 1999.

[26] Bartlett, M, G. Donato, Movellan, J. R., and J. Hager. Face image analysis for expression measurement and detection of deceit. In *Proceedings of the 6th Symposium on Neural Computation*, pages 8–16. California Institute of Technology, 1999.

[27] J. Hershey and J. R. Movellan. Audio-vision: Locating sounds via audio-visual synchrony. In *Proceedings of the 6th Symposium on Neural Computation*, pages 57–63. California Institute of Technology, 1999.

[28] J. R. Movellan and P. Mineiro. A diffusion network approach to visual speech recognition. In *Proceedings of the International Conference on Audio Visual Speech Processing*, pages 92–97. 1999.

[29] J. R. Movellan. A learning theorem for networks at detailed stochastic equilibrium. *Neural Computation*, 10(5):1157–1178, 1998. Click here for Web version (pdf).

[30] J. R. Movellan and P. Mineiro. Robust sensor fusion: Analysis and application to audiovisual speech recognition. *Machine Learning*, (32):85–100, 1998. Click here for Web version (pdf).

[31] P. Mineiro, J. R. Movellan, and R. J. Williams. Learning path

distributions using nonequilibrium diffusion networks. In M Kearns, editor, *Advances in Neural Information Processing Systems*, volume 10, pages 597–599. MIT Press, Cambridge, Massachusetts, 1998. Click here for Web version (pdf).

[32] J. R. Movellan and P. Mineiro. Bayesian robustification for audio visual fusion. In M Kearns, editor, *Advances in Neural Information Processing Systems*, pages 742–748. MIT Press, Cambridge, Massachusetts, 1998. Click here for Web version (pdf).

[33] M S. Gray, J. R. Movellan, and T. Sejnowski. Dynamic features for visual speechreading: A systematic comparison. In Mozer, Jordan, and Petsche, editors, *Advances in Neural Information Processing Systems*, volume 9. MIT Press, 1997. Click here for Web version (pdf).

[34] J. R. Movellan and George Chadderdon. Channel separability in the audio visual integration of speech: A Bayesian approach. In D. G. Stork and M. E. Hennecke, editors, *Speechreading by Humans and Machines: Models, Systems, and Applications*, pages 473–487. NATO/Springer-Verlag, New York, 1996.

[35] M. S. Gray, J. R. Movellan, and T. Sejnowski. Optical flow for visual speech recognition. In G. W. Cottrell, editor, *proceedings of the Eight Annual Conference of the Cognitive Science Society*, page 771. LEA, Mahwah, New Jersey, 1996.

[36] J. R. Movellan and George Chadderdon. Cognition and the statistics of natural signals. In G. W. Cottrell, editor, *proceedings of the Eight Annual Conference of the Cognitive Science Society*, pages 381–384. LEA, Mahwah, New Jersey, 1996.

[37] J. R. Movellan and Ram S. Prayaga. Gabor mosaics: A description of local orientation statistics with applications to machine perception. In G. W. Cottrell, editor, *proceedings of the Eight Annual Conference of the Cognitive Science Society*, page 817. LEA, Mahwah, New Jersey, 1996.

[38] George Chadderdon and J. Movellan. Testing for channel independence in bimodal speech recognition. In *Proceedings of 2nd Joint Symposium on Neural Computation*, pages 84–90, 1995.

[39] J. R. Movellan. Visual speech recognition with stochastic networks. In G. Tesauro, D. Touretzky, and T. Leen, editors, *Advances in neural*

information processing systems. MIT Press, Cambridge,Massacusetts, 1995. Click here for Web version (pdf).

[40] J. R. Movellan. Effects of the error function on the noise resistance and generalization performance of backpropagation. In Omid Omidvar, editor, *Progress in neural networks*, volume 4. Ablex, 1995.

[41] J. R. Movellan. In search of the statistical brain. *Center for Research on Language Newsletter*, 9(2), 1995.

[42] J. R. Movellan and J. L. McClelland. Covariance learning rules for stochastic neural networks. In *Proceedings of the world congress on neural networks*, volume 3, pages 376–381. LEA, 1994.

[43] J. R. Movellan and J. L. McClelland. Contrastive learning with graded random networks. In T. Petsche and M. Kearns, editors, *Computational Learning Theory and Natural Learning Systems*, volume 2. MIT Press, 1994.

[44] J. R. Movellan. A local algorithm to learn trajectories with stochastic neural networks. In J. Cowan, G. Tesauro, and J. Alspector, editors, *Advances in neural information processing systems*. Morgan Kaufman, San Mateo, 1994. Click here for Web version (pdf).

[45] J. R. Movellan and J. L. McClelland. Learning continuous probability distributions with symmetric diffusion networks. *Cognitive Science*, 17:463–496, 1993.

[46] John Kruschke and J. R. Movellan. Benefits of gain: speeded learning and minimal hidden layers in backpropagation networks. *IEEE transactions on systems, man and cybernetics*, 21:273–280, 1991.

[47] J. R. Movellan. Contrastive Hebbian learning in the continuous Hopfield model. In D. Touretzky, J. Elman, T. Sejnowski, and G. Hinton, editors, *Connectionist models:Proceedings of the 1990 Summer School*. Morgan Kaufmann, San Mateo, 1990. Click here for Web version (pdf).

[48] McClelland J. L. and Movellan J. Interactive activation and the effect of context on perception. In *Bulletin of the psychonomic society*, volume 28, austin, 1990.

CURRENT GRANTS

- Co-PI, NSF IIS IIS- 0343395: Workshop on Perceptive Animated Interfaces and Virtual Humans. $40,000.
- Co-PI, Nationall Alliance for Autism Research. Modelling the Emergence of Shared Attention (2003-2005). $120K.
- PI, NSF: Developmental Methods for Automatic Discovery of Object Categories. $296,646.
- PI, NSF/ITR: Automatic Analysis of Facial Expressions. $500K (2002-2003).
- PI, NSF/ITR: Creating the next generation of intelligent animated conversational agents. $556K (2000-2005).
- PI, NSF: Diffusion based approaches to unsupervised learning and inference. $150K (2001-2003)
- PI, DIMI grant: Affective Computing for Personal Robots. $300K (2003).
- Co-PI, MIND Institute: Neural Models of the development and dysfunction of shared attention $100K (2002).
- PI DIMI: Integrating perceptive and animation technnologies. $8K (2002)
- PI, Swartz Foundation: Integrating Dynamic EEG andf Automatic Facial Expression Analysis (2002/2003 $102,597)
- PI, ONR: Exploring the next generation of dynamic face recognition technology. (2002/2003 $250K).

GRANTS PENDING

- PI NSF ITR: "Social Resonance: Basic Research and Applications to Therapy and Education". Proposed budget $1.250M.
- PI NSF Comp Neuroscience: Unsupervised Methods for Joint Processing of Video and EEG signals. Proposed budget: $200K.

- Co-PI NIH: Automated Expression Measurement in Anxiety and Depression: $409K

PREVIOUS GRANTS

- PI, DIMI grant: Affective Computing for Personal Robots. $300K (2001).
- PI, Sony Research Grant $75K (2000).
- Co-PI, DOD grant: Automatizing the Facial Action Coding System $75K (2000-2001).
- Microsoft Research Gift $10K (2000).

RECENT PRESENTATIONS

[1] Movellan J. R. On smarticles and dumbicles: Two architectures for machine perception and robotics. In *UCSD Department of Computer Science*, La Jolla, CA, December 1, 2003.

[2] Movellan J. R., Hershey J., Marks T., and Roddey C. GFlow: A generative model for fast tracking using 3D deformable models. In *DARPA Symposium on Human ID*, Washington DC, September 29-30, 2003.

[3] Stewart-Bartlett M., Movellan J., and Sejnowski T. Unsupervised methods for face recognition. In *About Faces: A Multidisciplinary Approach to the Science of Face Perception*, Department of Psychology, Princeton University, September 19-21, 2003.

[4] O. Schwartz, J. R. Movellan, T. Wachtler, Albright T., and Sejnowski T. J. Spike count distributions factorability, and contextual effects in area V1. In *The Twelfth Annual Computational Neuroscience Meeting*, Spain, July 6, 2003.

[5] J. R. Movellan. A functionalist approach to the study of cognition. In *UCSD Department of Psychology*, May, 16, 2003.

[6] J. R. Movellan, Gwen Littlewort, and Stewart Bartlett Marian. Development, evaluation and application of a system for real time fully automatic face finding and emotion recognition. In *Learnign Workshop*

of the Computational and Biological Learning Society, Snowbird, Utah, April, 2, 2003.

[7] J. R. Movellan. The challenge of developing perceptive social robots. In *Microsoft Research Laboratories*, Redmond, USA, March 18, 2003.

[8] J. R. Movellan. Building perceptive social robots: A new research paradigm for the cognitive sciences. In *International Symposium on Emergent Mechanisms of Communication*, Awaji Yumebutai International Conference Center, Japan, Feb 28-March 3, 2003.

[9] J. R. Movellan. Building perceptive social robots: A new research paradigm for the cognitive sciences. In *International Symposium on Emergent Mechanisms of Communication*, Awaji Yumebutai International Conference Center, Japan, Feb 24, 2003.

[10] J. R. Movellan. A system for real time expression recognition. In *Center for Spoken Language Research*, University of Colorado, Boulder, February 11, 2003.

[11] J. R. Movellan. What social robots tell us about development. In *Department of Psychology*, University of Colorado, Boulder, February 10, 2003.

[12] J. R. Movellan. Machine perception, robotics and autism therapy. In *Autism Research Laboratory*, University of California, San Diego, February 5, 2003.

[13] J. R. Movellan, Wachtler T., Albright T., and Sejnowski T. Factorial coding of color in primary visual cortex. In *NIPS*, Vancouver, Canada, December 10, 2002.

[14] J. R. Movellan, Fasel I., and J. Chenu. Social communication as a real time control prolem. In *ATR*, Kyoto, December 12, 2002.

[15] J. R. Movellan. Social robots and development. In *Sociointelligenesis Club*, Kyoto, December 6, 2002.

[16] J. R. Movellan. Real time object detection and classification. In *Institute of Statistical Mathematics*, Tokyo, November 22, 2002.

[17] J. R. Movellan. Contingency, robotics and development. In *Annual Workshop of the Information Processing Society of Japan, Kansai area*, Osaka, October 31, 2002.

[18] J. R. Movellan. The emergence of joint attention as a real-time skill aquisition process. In *Institute of Advanced Studies*, Kyoto, October 26, 2002.

[19] J. R. Movellan and Fasel I. A new non-local algorithm for tracking deformable objects. In *Digital Creatures Laboratory*, Sony Corporation, Tokyo, October 14, 2002.

[20] J. R. Movellan. Expression recognition and E-learning. In *Workshop for Research and Development of Human Communication Technologies for Conversational Interaction and Learning*, NSF, Merida MX, April 18-21, 2002.

[21] J. R. Movellan. Automatic FACS coding. In *Workshop on Next Generation Face Recognition*, DARPA, March 4-5, 2002.

[22] J. R. Movellan. Information integration in the brain. In *Program on Dynamics of Complex Systems in Science and Engineering*, NortWestern University, May 18, 2001.

ADVISORS

- James, L. McClelland, Carnegie Mellon University, postgraduate advisor.
- John Watson, UC Berkeley, graduate advisor.
- Geoffrey Keppel, UC Berkeley, graduate advisor.

ADVISEES

1. Postdoctoral Students:
   - Mariam Bartlett; Psychology, UCSD (December 1998-2002).
   - Bjorn Braathen; Norwegian Defense Research Department (August 2000 - August 2001).
   - Gwen Littlewort-Ford; Physics, Oxford University (September 2000 - 2003).
   - J. Cooper Roddey (September 2003 - present).
2. Visiting Scholars:
   - Holger Quast, Department of Physics, University of Goettingen (December 1998-2000).

- Kenta Kawamoto, Digital Creatures Laboratory, Sony Corp, Tokyo, Japan (October 2000 -January 2001).

3. Graduate Students:

   - Joel Chenu (2002-present).
   - Johnathan Nelson (2000-present).
   - Ian Fasel (2000-present) .
   - Tim Marks (2000-present).
   - John Hershey (1996-2003). Moved to: Microsoft Research.
   - Paul Mineiro (1996-2000). Moved to: Idea Lab Inc.
   - Michael Gray (1993-1998). Moved to: Speech Machines LTD.
   - George Chadderdon (Masters thesis in Computer Science, 1995). Moved to: Indiana University Bloomington.

4. Undergraduate Students:

   - Joshua Susskind (May 2002-present).
   - Eric Carlson (May 2002- January 2003).
   - Boris Shpungin (Honors Thesis, May 1999- June 2000).
   - Evan Smith (Honors Thesis, November 1999-2001).
   - Etienne Prelaprat (March 2000-2002).
   - Bret Fortenberry (May 2003-present).
   - Daniel Eaton (Summer 2003).
   - Brooke Prosser (2002).

HONORS & AWARDS

Fulbright Scholarship		1984-1989.
Research Award	UC Berkeley	1988.
Teaching Award	UC Berkeley	1989.

PROFESSIONAL ACTIVITIES

- Chair on the Emotion Task Force from the IEEE Technical Committee on Autonomous Mental Development.
- General Chair, IEEE 2004 International Conference on Development and Learning. October 2004/

- Co-Chair: NSF Workshop on Perceptive Animated Interfaces and Virtual Humans. April 2004.
- Chair: DIMI 2002 Workshop on Perceptive Social Agents and Robots. January 2003.
- Member of the Research Council for the UC Digital Media Innovation Programm.
- Organizing Committee: Second International Conference on Development and Learning (ICDL'02).
- Organizing Committee: Perceptive User Interfaces 2001. Florida, November 2001.
- Organizing Committe: Independent Component Analysis 2001.
- Chair: Affective Computing Workshop, NIPS 2000.
- Organizing Committee: Perceptual User Interfaces (PUI 1998), San Francisco, November 1998.
- Chair: Applications of Computer Vision Workshop, NIPS 1997.
- Reviewer for the following Journals: Neural omputation, Cognitive Science, Computer Aided VLSI, Neural Networks, Journal of Learning and Memory, IEEE Transactions on Neural Networks, IEEE Transactions on Computers, 1997-present.
- NSF panelist: January 2000, March 2000.
- Reviewer for the following conferences: IJCAI (2003), CVPR (2001), NIPS (1997, 1998, 1999, 2000).
- Developer of the answer-key for Loftus and Loftus book on "The Essence of Statistics", Second Edition, Random House, 1988.

MEMBERSHIPS

- IEEE Society
- IEEE Systems Man and Cybernetics Society.

- Cognitive Science Society.
- Institute for Neural Computation.