

Olac Fuentes - Curriculum vitae

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EDUCATION

Ph.D. in Computer Science
Computer Science Department
University of Rochester
Rochester, NY
April 1997
Dissertation title: “*Behavior-Based Dextrous Manipulation: The Virtual Tool Approach*”.
Advisor: Prof. Randal C. Nelson

M.S. in Computer Science
Computer Science Department, University of Texas at El Paso
El Paso, TX
August 1991
Thesis title: “*Applying Uncertainty Formalisms to Well-defined Problems: Experimental and Theoretical Foundations*”.
Advisor: Prof. Vladik Kreinovich.

B.S. in Industrial Engineering
Instituto Tecnológico de Chihuahua
Chihuahua, México
July 1989

EXPERIENCE

Associate Professor
Computer Science Department
University of Texas at El Paso
El Paso, TX
September 2005 - Present

Associate Professor
Computer Science Department
National Institute of Astrophysics, Optics and Electronics (INAOE)
Santa Maria Tonantzintla, Puebla, México
August 1998 – August 2005

Visiting Assistant Professor
Computer Science Department
Oklahoma State University
Stillwater, OK
January 1999 – May 1999

Associate Professor
Computer Science Research Center
National Polytechnic Institute
Mexico City, Mexico
July 1997 – July 1998

PUBLICATIONS

Refereed Journal Papers

- [1] Debra P.C. Peters, Kris M. Havstad, Judy Cushing, Craig Tweedie, Olac Fuentes, and Natalia Villanueva-Rosales. Harnessing the power of big data: infusing the scientific method with machine learning to transform ecology. *Ecosphere*, Volume 5, Issue 6 (June 2014).
- [2] Vladik Kreinovich and Olac Fuentes. High-concentration chemical computing techniques for solving hard-to-solve problems, and their relation to numerical optimization, neural computing, reasoning under uncertainty, and freedom of choice. In Evgeny Katz, editor, *Molecular and Supramolecular Information Processing - From Molecular Switches to Logic Systems*, pages 210–235. Wiley-VCH, 2012.
- [3] Juan Carlos Gómez and Olac Fuentes. Using Evolution Strategies to Perform Stellar Population Synthesis for Galaxy Spectra from SDSS. *International Journal of Applied Evolutionary Computation*, 1(4):23–33, 2010.
- [4] Luis Malagón-Borja* and Olac Fuentes. Object detection using image reconstruction with PCA. *Image and Vision Computing*, 27(1-2):2–9, January 2009.
- [5] Trilce Estrada*, Olac Fuentes, and Michela Taufer. A distributed evolutionary method to design scheduling policies for volunteer computing. *ACM SIGMETRICS PER (Performance Evaluation Review)*, 36(3), June 2008.
- [6] Steven Gutstein*, Olac Fuentes, and Eric Freudenthal. Knowledge transfer in deep convolutional neural nets. *International Journal on Artificial Intelligence Tools (IJAIT)*, 17(3):555–567, June 2008.

- [7] Thamar Solorio*, Olac Fuentes, Roberto Terlevich, and Elena Terlevich. An Active Instance-based Machine Learning Method for Stellar Population Studies. *Monthly Notices of the Royal Astronomical Society*, 363(2), October 2005.
- [8] Jorge de la Calleja* and Olac Fuentes. Machine learning and image analysis for morphological galaxy classification. *Monthly Notices of the Royal Astronomical Society*, 349:87–93, March 2004.
- [9] Carmen Martínez* and Olac Fuentes. Face recognition using unlabeled data. *Computación y Sistemas - Iberoamerican Journal of Computer Science Research*, 7(2):123–129, 2003.
- [10] Federico Ramírez* and Olac Fuentes. A hybrid algorithm for spectral analysis. *Experimental Astronomy*, 14(3):129–146, 2002.
- [11] Sergio Vázquez y Montiel, Juan Sánchez*, and Olac Fuentes. Obtaining the phase of an interferogram using an evolution strategy, part I. *Applied Optics*, 41(17):3448–3452, June 2002.
- [12] Federico Ramírez*, Olac Fuentes, and Ravi K. Gulati. Prediction of stellar atmospheric parameters using instance-based machine learning and evolutionary algorithms. *Experimental Astronomy*, 12(3):163–178, 2001.
- [13] Olac Fuentes. Automatic determination of stellar atmospheric parameters using neural networks and instance-based learning. *Experimental Astronomy*, 12(1):21–31, 2001.
- [14] Olac Fuentes and Ravi K. Gulati. Prediction of stellar atmospheric parameters from spectra, spectral indices and spectral lines using machine learning. *Revista Mexicana de Astronomía y Astrofísica*, 10:209–212, 2001.
- [15] Olac Fuentes and Randal C. Nelson. Learning dextrous manipulation strategies for multifingered robot hands using the evolution strategy. *Machine Learning*, 31:223–237, 1998.
- [16] Rajesh P. N. Rao and Olac Fuentes. Hierarchical learning of navigational behaviors in an autonomous robot using a predictive sparse distributed memory. *Machine Learning*, 31:87–113, 1998.
- [17] Olac Fuentes and Randal C. Nelson. Learning dextrous manipulation strategies for multifingered robot hands using the evolution strategy. *Autonomous Robots*, 5:395–405, 1998.
- [18] Rajesh P. N. Rao and Olac Fuentes. Hierarchical learning of navigational behaviors in an autonomous robot using a predictive sparse distributed memory. *Autonomous Robots*, 5:297–316, 1998.
- [19] Olac Fuentes, Rajesh P. N. Rao, and Michael Van Wie. Hierarchical learning of reactive behaviors in an autonomous mobile robot. *Computación y Sistemas - Iberoamerican Journal of Computer Science Research*, 1(2):71–75, 1997.
- [20] Vladik Kreinovich, Chris Quintana, and Olac Fuentes. Genetic algorithms: What fitness scaling is optimal? *Cybernetics and Systems*, 24:9–26, 1993.

Refereed Conference Papers

- [1] Geovany Ramírez*, Olac Fuentes, Stephen L. Crites Jr., Maria Jimenez, and Juanita Ordonez. Color analysis of facial skin: Detection of emotional state. In *Workshop on Computational Models for Social Interactions and Behavior (CMSI): Scientific Grounding, Sensing and Applications*, Held in conjunction with Conference on Computer Vision and Pattern Recognition (CVPR 2014), Columbus, Ohio, June 2014.
- [2] Jonathan Quijas and Olac Fuentes. Removing JPEG blocking artifacts using machine learning. In *2014 Southwest Symposium on Image Analysis and Interpretation*, San Diego, CA, April 6-8, 2014.
- [3] Geovany Ramírez* and Olac Fuentes. Street Detection with Asymmetric Haar Features. In *Proceedings of the 17th Iberoamerican Congress on Pattern Recognition (CIARP 2012)*, Buenos Aires, Argentina, September 2012.
- [4] Federico Ramirez, Olac Fuentes, Rodrigo Romero, and Aaron Velasco. Street detection with asymmetric Haar features. In *11th Mexican International Conference on Artificial Intelligence*, San Luis Potos, SLP, Mexico, October 27 - November 4 2012.
- [5] Murad Alaqtash, Thompson Sarkodie-Gyan, Huiying Yu, Olac Fuentes, Richard Brower, and Amr Abdelgawad. Automatic classification of pathological gait patterns using ground reaction forces and machine learning algorithms. In *33rd Annual International Conference of the IEEE EMBS*, Boston, Massachusetts USA, August 30 - September 3 2011.
- [6] Steven Gutstein, Olac Fuentes, and Eric Freudenthal. Latent learning - what your net also learned. In *Proceedings of the 2011 International Joint Conference on Neural Networks (IJCNN)*, San Jose, CA, August 2011.
- [7] Gesuri Ramírez*, Olac Fuentes, and Craig E. Tweedie. Assessing data quality in a sensor network for environmental monitoring. In *Proceedings of the 2011 Annual Meeting of the North American Fuzzy Information Processing Society (NAFIPS 2011)*, El Paso, TX, March 2011.
- [8] Joshua Osbeck*, Shamsnaz Virani, Olac Fuentes, and Patricia Roden. Investigation of automatic prediction of software quality. In *Proceedings of the 2011 Annual Meeting of the North American Fuzzy Information Processing Society (NAFIPS 2011)*, El Paso, TX, March 2011.
- [9] Nigel Ward, Olac Fuentes, and Alejandro Vega*. Dialog prediction for a general model of turn-taking. In *Proceedings the 2010 International Conference on Spoken Language Processing (Interspeech 2010)*, Makuhari, Japan, September 2010.
- [10] Steven Gutstein*, Olac Fuentes, and Eric Freudenthal. Latent learning in deep neural nets. In *Proceedings of International Joint Conference on Neural Networks (IJCNN)*, Barcelona, Spain, July 2010.
- [11] Jun Zheng*, Geovany A. Ramirez*, and Olac Fuentes. Face detection in low-resolution color images. In *7th International Conference on Image Analysis and Recognition (ICIAR)*, Povo de Varzim, Portugal, June 2010.

- [12] Jun Zheng*, Olac Fuentes, Ming-Ying Leung, and Elais Jackson*. Mammogram compression using super-resolution. In *International Workshop on Digital Mammography*, Girona, Spain, June 2010.
- [13] Jun Zheng*, Olac Fuentes, and Ming-Ying Leung. Super-resolution of mammograms. In *Proceedings of IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB 2010)*, Montreal, Canada, May 2010.
- [14] Jun Zheng* and Olac Fuentes. A stochastic method for face image super-resolution. In *Proceedings of 5th International Symposium on Visual Computing (ISVC09)*, Las Vegas, Nevada, November 2009.
- [15] Jorge de la Calleja, Olac Fuentes, Jesús González, and Rita M. Aceves-Perez. A learning method for imbalanced data sets. In *International Conference on Knowledge Discovery and Information Retrieval*, Madeira, Portugal, October 2009.
- [16] Manali Chakraborty* and Olac Fuentes. Real-time image-based motion detection using color and structure. In *International Conference on Image Analysis and Recognition (ICIAR)*, Halifax, Canada, July 2009.
- [17] Trilce Estrada*, Olac Fuentes, and Michela Taufer. A distributed evolution-based algorithm to design scheduling policies for volunteer computing. In *Proceedings of the 2008 ACM International Conference on Computing Frontiers*, Ischia, Italy, May 2008.
- [18] Jorge de la Calleja*, Jesús González, and Olac Fuentes. Selecting minority examples from misclassified data for over-sampling. In *Proceedings of the 21st International FLAIRS Conference*, Coconut Grove, Florida, May 2008.
- [19] Steven Gutstein*, Olac Fuentes, and Eric Freudenthal. The utility of knowledge transfer with noisy training sets. In *Proceedings of the 21st International FLAIRS Conference*, Coconut Grove, Florida, May 2008.
- [20] Juan Carlos Gómez* and Olac Fuentes. Using evolution strategies for automatic extraction of parameters for stellar population synthesis of galaxy spectra from SDSS. In *IEEE Congress on Evolutionary Computation (CEC)*, Singapore, September 2007.
- [21] Luis David Lopez* and Olac Fuentes. Color-based road sign detection and tracking. In *International Conference on Image Analysis and Recognition (ICIAR)*, Montreal, Canada, August 2007.
- [22] Juan Carlos Gómez* and Olac Fuentes. A hybrid algorithm based on evolution strategies and instance-based learning applied to two-dimensional fitting of brightness profiles in galaxy images. In *International Conference on Machine Learning and Data Mining (MLDM)*, Leipzig, Germany, July 2007.
- [23] Jorge de la Calleja* and Olac Fuentes. Learning from imbalanced datasets using a distance-based over-sampling method. In *International Conference on Machine Learning and Data Mining (MLDM)*, Leipzig, Germany, July 2007.
- [24] Juan Carlos Gomez* and Olac Fuentes. Using evolution strategies for automatic extraction of parameters for stellar population synthesis of galaxy spectra from sdss. In *Genetic and Evolutionary Computation Conference (GECCO 2007)*, London, England, July 2007. (Poster Presentation).

- [25] Steven Gutstein*, Olac Fuentes, and Eric Freudenthal. Knowledge transfer in deep convolutional neural nets. In *Proceedings of the FLAIRS-07 Conference*, Key West, Florida, May 2007.
- [26] Jorge de la Calleja* and Olac Fuentes. A distance-based over-sampling method for dealing with imbalanced data sets. In *Proceedings of the FLAIRS-07 Conference*, Key West, Florida, May 2007. (Poster Presentation).
- [27] Olac Fuentes, David Vera*, and Thamar Solorio. A filter-based approach to detect end-of-utterances from prosody in dialog systems. In *Proceedings of the The Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT 2007)*, Rochester, New York, April 2007.
- [28] Jorge de la Calleja* and Olac Fuentes. Automated star/galaxy discrimination in multispectral wide-field images. In *Proceedings of the Second International Conference on Computer Vision Theory and Applications (VISAPP)*, Barcelona, Spain, March 2007.
- [29] Thamar Solorio, Olac Fuentes, Nigel Ward, and Yaffa Al Bayyari*. Prosodic feature generation for back-channel prediction. In *Proceedings The Ninth International Conference on Spoken Language Processing (Interspeech 2006 ICSLP)*, Pittsburgh, PA, September 2006.
- [30] H. Jair Escalante* and Olac Fuentes. Analysis of galactic spectra using noise-aware learning algorithm. In *The 19th International FLAIRS Conference*, Melbourne Beach, Florida, May 2006.
- [31] Jorge de la Calleja* and Olac Fuentes. Automated classification of astronomical objects in multispectral wide-field images. In *The 19th International FLAIRS Conference*, Melbourne Beach, Florida, May 2006.
- [32] José Martínez* and Olac Fuentes. C4.5 as a variable selection criterion in classification tasks. In *Proceedings of IASTED International Conference on Artificial Intelligence and Soft Computing*, Benidorm, Spain, September 2005.
- [33] Juan Carlos Gomez*, Olac Fuentes, and Ivanio Puerari. Two-dimensional fitting of brightness profiles in galaxy images with a hybrid algorithm. In *Proceedings of the Ninth International Conference on Knowledge-Based Intelligent Information and Engineering Systems (KES)*, Melbourne Australia, September 2005. (Lecture Notes in Artificial Intelligence 3682).
- [34] Trice Estrada-Piedra* and Olac Fuentes. Identification of stellar populations in galactic spectra using the hierarchical decision ensemble. In *The 18th International FLAIRS Conference*, Clearwater Beach, Florida, May 2005.
- [35] José Luis Malagón* and Olac Fuentes. An object detection system using image reconstruction with PCA. In *Proceedings of the Second Canadian Conference on Computer and Robot Vision (CRV 2005)*, pages 2–8, Victoria, B.C., Canada, May 2005.
- [36] Geovany Ramírez* and Olac Fuentes. Face detection using combinations of classifiers. In *Proceedings of the Second Canadian Conference on Computer and Robot Vision (CRV 2005)*, pages 610–615, Victoria, B.C., Canada, May 2005.

- [37] Olac Fuentes, Thamar Solorio*, Roberto Terlevich, and Elena Terlevich. Analysis of galactic spectra using active instance-based learning and domain knowledge. In *Proceedings of IX Iberoamerican Conference on Artificial Intelligence (IBERAMIA)*, pages 215–224, Puebla, Mexico, November 2004. Lecture Notes in Artificial Intelligence 3315.
- [38] Antonio Salim*, Olac Fuentes, and Angélica Muñoz. Development of local perception-based behaviors for a robotic soccer player. In *Proceedings of IX Iberoamerican Conference on Artificial Intelligence (IBERAMIA)*, pages 535–544, Puebla, Mexico, November 2004. Lecture Notes in Artificial Intelligence 3315.
- [39] Luis Álvarez*, Olac Fuentes, and Roberto Terlevich. Extracting stellar population parameters of galaxies from photometric data using evolution strategies and locally weighted linear regression. In *Proceedings of the 8th International Conference on Knowledge-Based Intelligent Information and Engineering Systems, Part III*, pages 395–403, Wellington, New Zealand, September 2004. Lecture Notes in Artificial Intelligence 3215.
- [40] Jorge de la Calleja* and Olac Fuentes. Automated classification of galaxy images. In *Proceedings of the 8th International Conference on Knowledge-Based Intelligent Information and Engineering Systems, Part III*, pages 411–418, Wellington, New Zealand, September 2004. Lecture Notes in Artificial Intelligence 3215.
- [41] Juan Carlos Gómez*, Olac Fuentes, Lia Athannasoula, and Albert Bosma. Using evolution strategies to model the M81 triplet. In *Proceedings of the 8th International Conference on Knowledge-Based Intelligent Information and Engineering Systems, Part III*, pages 404–410, Wellington, New Zealand, September 2004. Lecture Notes in Artificial Intelligence 3215.
- [42] Antonio Salim*, Olac Fuentes, and Angélica Muñoz. Development of local vision-based behaviors for a robotic soccer player. In *Proceedings of the Mexican International Conference on Computer Science*, pages 275–281, Colima, Mexico, September 2004.
- [43] Olac Fuentes and Thamar Solorio*. An optimization algorithm based on active and instance-based learning. In *Proceedings of 2004 Mexican International Conference on Artificial Intelligence (MICA)*, pages 242–251, Mexico City, Mexico, April 2004. Lecture Notes in Artificial Intelligence 2972.
- [44] Vittorio Zanella* and Olac Fuentes. An approach to automatic model-based morphing of face images in frontal view. In *Proceedings of 2004 Mexican International Conference on Artificial Intelligence (MICA)*, pages 679–687, Mexico City, Mexico, April 2004. Lecture Notes in Artificial Intelligence 2972.
- [45] Carmen Martinez* and Olac Fuentes. Face recognition using unlabeled data. In *Proceedings of CIC-2003*, Mexico City, Mexico, October 2003.
- [46] Vittorio Zanella* and Olac Fuentes. Model-based automatic morphing of face images in frontal view. In *Proceedings of IASTED International Conference on Visualization, Imaging and Image Processing*, pages 55–60, Benalmadena, Spain, September 2003.
- [47] Jorge de la Calleja*, Olac Fuentes, and Aurelio López López. Content-based retrieval of astronomical images. In *Proceedings of IASTED International Conference on Artificial Intelligence and Applications*, Benalmadena, Spain, September 2003.

- [48] Olac Fuentes and Thamar Solorio*. Interferogram analysis using active instance-based learning. In *Proceedings of IASTED International Conference on Artificial Intelligence and Applications*, Benalmadena, Spain, September 2003.
- [49] Geovany Ramírez*, Vittorio Zanella*, and Olac Fuentes. Heuristic-based face detection. In *Proceedings of IASTED International Conference on Computer Graphics and Imaging*, Honolulu, Hawaii, July 2003.
- [50] Vittorio Zanella* and Olac Fuentes. Evolution strategies for automatic image morphing. In *Proceedings of International Conference on Computational Intelligence for Modelling Control and Automation*, pages 55–60, Vienna, Austria, February 2003.
- [51] Jorge de la Calleja* and Olac Fuentes. Image-based morphological classification of galaxies using ensembles of classifiers. In *Proceedings of XI International Computer Science Congress*, Mexico City, Mexico, November 2002.
- [52] Federico Ramírez* and Olac Fuentes. Spectral analysis using evolution strategies. In *Proceedings of IASTED International Conference on Artificial Intelligence and Soft Computing*, Banff, Canada, July 2002.
- [53] Thamar Solorio* and Olac Fuentes. Taking advantage of unlabeled data with the ordered classification algorithm. In *Proceedings of IASTED International Conference on Artificial Intelligence and Soft Computing*, Banff, Canada, July 2002.
- [54] Thamar Solorio* and Olac Fuentes. Improving classification accuracy of large test sets using the ordered classification algorithm. In *Proceedings of VIII Iberoamerican Conference on Artificial Intelligence (IBERAMIA)*, pages 70–79, Seville, Spain, November 2002. Lecture Notes in Artificial Intelligence 2527.
- [55] Federico Ramírez* and Olac Fuentes. Prediction of stellar atmospheric parameters using instance-based machine learning and evolutionary algorithms. In *Proceedings of IASTED International Conference on Artificial Intelligence and Applications (AIA2001)*, Marbella, Spain, September 2001.
- [56] Thamar Solorio* and Olac Fuentes. Improving classifier accuracy using unlabeled data. In *Proceedings of IASTED International Conference on Artificial Intelligence and Applications (AIA2001)*, Marbella, Spain, September 2001.
- [57] Olac Fuentes. Neural networks and instance-based learning for the prediction of stellar atmospheric parameters. In *Proceedings of IASTED International Conference on Artificial Intelligence and Soft Computing (ASC2001)*, Cancun, Mexico, May 2001.
- [58] Olac Fuentes and Randal C. Nelson. Learning dextrous manipulation skills using the evolution strategy. In *Proceedings of the 1997 IEEE International Conference on Robotics and Automation*, Albuquerque, New Mexico, April 1997.
- [59] Martin Jägersand, Olac Fuentes, and Randal C. Nelson. Experimental evaluation of uncalibrated visual servoing for precision manipulation. In *Proceedings of the 1997 IEEE International Conference on Robotics and Automation*, Albuquerque, New Mexico, April 1997.

- [60] Martin Jägersand, Olac Fuentes, and Randal C. Nelson. Acquiring visual-motor models for precision manipulation with robot hands. In *Proceedings of the Fourth European Conference on Computer Vision*, pages 603–612, Cambridge, U. K., 1996. Lecture Notes in Computer Science 1065.
- [61] Olac Fuentes and Randal C. Nelson. The virtual tool approach to dextrous telemanipulation. In *Proceedings of the 1996 IEEE International Conference on Robotics and Automation*, pages 1700–1705, Minneapolis, Minnesota, April 1996.
- [62] Olac Fuentes and Randal C. Nelson. Learning dextrous manipulation skills using multisensory information. In *Proceedings of the 1996 IEEE/SICE/RSJ/ International Conference on Multisensor Fusion and Integration for Intelligent Systems*, pages 342–348, Washington, D.C., December 1996.
- [63] Olac Fuentes and Randal C. Nelson. Experiments on dextrous manipulation without prior object models. In *Proceedings of the 1996 IEEE International Symposium on Intelligent Control*, Dearborn, Michigan, September 1996.
- [64] Rajesh P. N. Rao and Olac Fuentes. Learning navigational behaviors using a predictive sparse distributed memory. In *From Animals to Animats: Proceedings of the Fourth International Conference on Simulation of Adaptive Behavior*, Cape Cod, Massachusetts, September 1996.
- [65] Olac Fuentes, Rajesh P. N. Rao, and Michael Van Wie. Hierarchical learning of reactive behaviors in an autonomous mobile robot. In *Proceedings of the IEEE International Conference on Systems, Man and Cybernetics 1995*, pages 4691–4695, Vancouver, B.C., Canada, October 1995.
- [66] Rajesh P. N. Rao and Olac Fuentes. Perceptual homing by an autonomous mobile robot using sparse self-organizing sensory-motor maps. In *Proceedings of the World Congress on Neural Networks 1995*, Washington, D.C., July 1995.
- [67] Ongard Sirisaengtaksin, Olac Fuentes, and Vladik Kreinovich. Non-traditional neural networks that solve one more intractable problem: propositional satisfiability. In *Proceedings of the First International Conference on Neural, Parallel, and Scientific Computations*, Atlanta, GA, May 1995.
- [68] Vladik Kreinovich, Robert Lea, Olac Fuentes, and Anatole Lockshin. Fuzzy control is often better than manual control of the very experts whose knowledge it uses: an explanation. In *Proceedings of the 1992 IEEE International Conference on Tools with Artificial Intelligence*, Arlington, Virginia, November 1992.
- [69] V. Kreinovich, C. Quintana, R. Lea, O. Fuentes, S. Kumar, I. Borisheva, and L. Reznik. What Non-linearity to Choose? Mathematical Foundations of Fuzzy Control. In *Proceedings of the 1992 International Fuzzy Systems and Intelligent Control Conference*, Louisville, Kentucky, March 1992.
- [70] Olac Fuentes and Vladik Kreinovich. Simulation of chemical kinetics: a promising approach to inference engines. In *Proceedings of the First World Congress on Expert Systems*, Orlando, Florida, December 1991.

Other Conference Papers

- [1] Juan Carlos Gomez and Olac Fuentes. Extracting parameters for stellar populations synthesis from sdss galaxy spectra using evolution strategies. In *The Virtual Observatory in Action: New Science, New Technology, and Next Generation Facilities, 26th meeting of the IAU*, Prague, Czech Republic, August 2006.
- [2] Juan Carlos Gomez and Olac Fuentes. Using a novel hybrid algorithm for two-dimensional model of brightness profiles in elliptical and spiral galaxy images. In *Astronomical Data Analysis Software and Systems XV*, San Lorenzo de El Escorial, Spain, October 2005.
- [3] H. Jair Escalante and Olac Fuentes. Noise elimination with a re-sampling algorithm. In Guillermo De Ita, Olac Fuentes, and Mauricio Osorio, editors, *IX Ibero-american Workshops on Artificial Intelligence*, pages 307–316, Puebla, Mexico, November 2004. Proceedings of First Iberoamerican Workshop on Machine Learning for Scientific Data Analysis.
- [4] Trilce Estrada-Piedra and Olac Fuentes. Identification of stellar populations in galactic spectra using the hierarchical decision ensemble. In Guillermo De Ita, Olac Fuentes, and Mauricio Osorio, editors, *IX Ibero-american Workshops on Artificial Intelligence*, pages 371–378, Puebla, Mexico, November 2004. Proceedings of First Iberoamerican Workshop on Machine Learning for Scientific Data Analysis.
- [5] Elena Terlevich, Roberto Terlevich, Juan P. Torres Papaqui, Trilce Estrada Piedra, Olac Fuentes, Thamar Solorio, and Sandro Bressan. Computer science approach to the stellar fabric of violent starforming regions in agn. In T. Storchi-Bergmann, L. C. Ho, and H. R. Schmitt, editors, *IAU Symposium, the interplay among black holes, stars and ISM in Galactic Nuclei*, number 222. International Astronomical Union, 2004.
- [6] Thamar Solorio, Olac Fuentes, Roberto Terlevich, Elena Terlevich, and Alessandro Bressan. Automated determination of stellar population parameters in galaxies using active instance-based learning. In Francois Ochsenbein, Mark G. Allen, and Daniel Egret, editors, *Astronomical Data Analysis Software and Systems XIII*, volume 314 of *Astronomical Society of the Pacific Conference Series*, pages 609–612, Strasbourg, France, October 2003. A.S.P.
- [7] Juan Carlos Gómez, Lia Athannasoula, and Olac Fuentes. Determination of initial conditions of M81 triplet using evolution strategies. In Francois Ochsenbein, Mark G. Allen, and Daniel Egret, editors, *Astronomical Data Analysis Software and Systems XIII*, volume 314 of *Astronomical Society of the Pacific Conference Series*, pages 629–632, Strasbourg, France, October 2003. A.S.P. Astronomical Society of the Pacific Conference Series Volume 314.
- [8] Trilce Estrada-Piedra, Juan P. Torres-Papaqui, Roberto Terlevich, Olac Fuentes, and Elena Terlevich. Age determination for the nuclear stellar population of active galactic nuclei (AGN) using locally weighted regression (LWR). In Francois Ochsenbein, Mark G. Allen, and Daniel Egret, editors, *Astronomical Data Analysis Software and Systems XIII*, pages 633–636, Strasbourg, France, October 2003. Astronomical Society of the Pacific Conference Series Volume 314.
- [9] Olac Fuentes. Finding errors in astronomical catalogs using machine learning. In David A. Bohlender, Daniel Durand, and T. H. Handley, editors, *Astronomical Data Analysis Software and*

Systems XI, pages 148–151, Victoria, B.C., Canada, October 2001. Astronomical Society of the Pacific Conference Series Volume 281.

- [10] Juan Carlos Gómez, Olac Fuentes, and Ivanio Puerari. Determination of orbital parameters of interacting galaxies using evolution strategies. In David A. Bohlender, Daniel Durand, and T. H. Handley, editors, *Astronomical Data Analysis Software and Systems XI*, pages 409–412, Victoria, B.C., Canada, October 2001. Astronomical Society of the Pacific Conference Series Volume 281.
- [11] Tamar Solorio and Olac Fuentes. Using unlabeled data to improve the automated prediction of stellar atmospheric parameters. In David A. Bohlender, Daniel Durand, and T. H. Handley, editors, *Astronomical Data Analysis Software and Systems XI*, pages 405–408, Victoria, B.C., Canada, October 2001. Astronomical Society of the Pacific Conference Series Volume 281.
- [12] Sergio Vazquez y Montiel, Olac Fuentes, and Juan Jaime Sanchez-Escobar. Obtaining the phase of a noisy synthetic interferogram using an evolution strategy. In *Proceedings of OPTILAS*, Buenos Aires, Argentina, July 2001.
- [13] Olac Fuentes and Ravi K. Gulati. Prediction of stellar atmospheric parameters using neural networks and instance-based learning. In *Proceedings of International Workshop on Advances on Artificial Perception and Robotics*, Guanajuato, Mexico, October 2000.
- [14] Olac Fuentes and Ravi K. Gulati. Prediction of stellar atmospheric parameters from spectra, spectral indices and spectral lines using machine learning. In *Proceedings of the Seventh Texas-Mexico Conference on Astrophysics*, Austin, Texas, April 2000.
- [15] Olac Fuentes and Ravi K. Gulati. Instance-based machine learning methods for the prediction of stellar atmospheric parameters. In Nadine Manset, Christian Veillet, and Dennis Crabtree, editors, *Astronomical Data Analysis Software and Systems IX*, pages 611–614, Waikoloa, Hawaii, October 1999. Astronomical Society of the Pacific Conference Series Volume 216.
- [16] Olac Fuentes and Vladik Kreinovich. Towards intelligent virtual environment for teaching tele-manipulation operators: Virtual tool approach and its interval-based justification. In *Proceedings of the Second International Workshop on Intelligent Virtual Environments*, Jalapa, Mexico, September 1998.

* denotes student co-author.

Citations to Publications

Over 600, as of June 2014.

FUNDED RESEARCH

Currently Funded Grants

1. NSF - IIS 1241434 - UTEP REU Summer Site in Applied Intelligent Systems. June 2012 - June 2015. \$317,286. P.I. Olac Fuentes. Collaborators: Martine Ceberio, Kyung-An Han, M. Shahriar Hossain, Christopher Kiekintveld, David Novick, Ana Schwartz, and Nigel Ward.

Finished Grants

1. UTEP - IDR 19507786 - Multispectral Analysis of Facial Skin: Detecting Emotional State. January 2013 - December 2013. \$20,000. P.I. Olac Fuentes, co-P.I.s Stephen Crites and Miguel Velez.
2. NSF - IIS 0914868 - Time-based Language Modeling. September 2009 - August 2012. \$450,000. P.I. Nigel Ward, co-P.I.s David Novick and Olac Fuentes.
3. NSF - IIS 0852066 - UTEP REU Summer Site in Applied Intelligent Systems. March 2009 - February 2012. \$315,000. P.I. Olac Fuentes. Collaborators: Martine Ceberio, Steve Roach, Christian Meissner, Jose Espiritu, Ming-Ying Leung, Heidi Taboada, Max Shpak, Shamsnaz Virani, Nigel Ward.
4. NIH - GM008012 Computational Prediction of RNA Viral Genome Structures. Dates: June 2007- May 2011. \$495,000. P.I. Ming-Ying Leung, co-P.I. Olac Fuentes.
5. DoD - Center for Defense Systems Research (CDSR). P.I. General Joe Riojas. Dates: October 2007- September 2008. Amount \$1,000,000.00. Project: A Practical Visual Sensing and Image Dissemination System for Pervasive Monitoring. Project Amount: \$175,000. P.I.s Eric Freudenthal and Olac Fuentes.
6. Mexican National Council for Science and Technology (CONACYT) - Grant 45258, Machine Learning for Classification, Regression and Intelligent Optimization: New Algorithms and Astronomical Applications, 2004-2007, 332,000 Mexican pesos (approx. \$32,000). PI: Olac Fuentes.
7. Mexican National Council for Science and Technology (CONACYT) - Grant J31877A, Machine Learning for Astronomical Data Analysis, 2000-2003, 566,000 Mexican pesos (approx. \$55,000). PI: Olac Fuentes.
8. Mexican National Council for Science and Technology (CONACYT) - Grant I53174, Applied Machine Learning, 1998-1999, 100,000 Mexican pesos (approx. \$10,000). PI: Olac Fuentes.
9. Mexican Ministry of Education and National Council for Science and Technology (CONACYT) - M.S. and Ph.D. Programs in Computer Science at INAOE, 1999-2006, 10,800,000 Mexican pesos (approx. \$1,008,000). PIs: Ariel Carrasco, Olac Fuentes and Aurelio López.

TEACHING ACCOMPLISHMENTS

1. Chair of the fundamentals committee 2006-present.
2. Developed following new courses:
 - CS 5354 Machine Learning
 - CS 5354 Computer Vision
 - BINF 5112 Computer Science for Bioinformatics
3. Performed significant revisions and upgrades to the following existing courses:
 - CS2401 Elementary Data Structures and Algorithms
 - CS2302 Data Structures

- CS3370 Computer Graphics
 - CS4320/5314 Artificial Intelligence
4. Invited speaker at national panel on mentoring at minority serving intuitions, Madison, Wisconsin, June 2008.
 5. Invited speaker at NSF-sponsored panel on mentoring at minority serving intuitions, Charlotte, N.C., March 2010.
 6. Founded the Vision and Learning Laboratory, where, in addition to performing research activities, I've mentored over 15 graduate and undergraduate students.
 7. I have been the co-P.I. and collaborator of several grant proposals aimed at improving the quality of courses in the Fundamental Computer Science Sequence.
 8. Worked as an invited (paid) reviewer for a new edition of the textbook *Introduction to Java Programming*, by Y. Daniel Liang, one of the most commonly-used books in the Fundamental Computer Science Sequence nationwide.
 9. I participated since 2007 as a mentor in the College Assistance Migrant Program (CAMP) at UTEP. This program is designed to help students from migrant and seasonal farm worker backgrounds succeed in college. My duties include meeting periodically with my mentees to discuss academic and non-academic issues related to their personal and professional development.
 10. I am a member of the thesis committee of several students in Mexican institutions, including ITESM and INAOE. My relationship with these institutions has helped recruit four Ph.D. students to our department, three of whom obtained CONACYT Fellowships from the Mexican government.
 11. P.I. of the project UTEP REU Summer Site in Applied Intelligent Systems, where 16 undergraduate students have been mentored to develop research skills.

Student Supervision

Ph.D. Theses

1. Geovany Ramirez-Garcia, Multi-dimensional Emotion Recognition from Geometry and Color Information, Ph.D. in Computer Science. University of Texas at El Paso, May, 2014.
2. Jun (Jason) Zheng. Stochastic Optimization for Learning-based Super-resolution: Algorithms and Applications. Ph.D. in Computer Science. University of Texas at El Paso, December, 2010.
3. Steven M. Gutstein, Transfer Learning Techniques for Deep Neural Nets, Ph.D. in Computer Science, University of Texas at El Paso, May 2010.
4. Jorge de la Calleja, Machine Learning from Imbalanced Data Sets with Application in Classification of Astronomical Objects, Ph.D. in Computer Science, INAOE, March 2008. Co-supervised with Jesús González.
5. Juan Carlos Gómez-Carranza, Inverse Active Machine Learning in Optimization Processes with Applications in Astronomy, Ph.D. in Computer Science, INAOE, February 2007.
6. Vittorio Zanella-Palacios, Automated Morphing of Face Images, Ph.D. in Computer Science, INAOE, January 2005.
7. José Federico Ramírez-Cruz, Instance and Feature Selection for Instance-Based Machine Learning Using Evolutionary Algorithms, Ph.D. in Computer Science, INAOE, October 2003.
8. Juan Jaime Sánchez-Escobar, Finding the Phase of an Interferogram Using Evolution Strategies, Ph.D. in Optics, INAOE, November 2002. Co-supervised with Sergio Vázquez.

M.S. Theses

1. Tariq Iqbal, A Robust Real-time Eye Tracking and Gaze Estimation System Using Particle Filters, M.S. in Computer Science, University of Texas at El Paso, July 2012.
2. Gesuri Ramirez-Garcia, Assessing Data Quality in a Sensor Network for Environmental Monitoring, M.S. in Computer Science, University of Texas at El Paso, December 2011.
3. Christopher Cuellar, Prediction of Ribonucleic Acid Secondary Structures using a Heuristic Backtracking Search, M.S. in Computer Science, University of Texas at El Paso, November 2011.
4. Manali Chakraborty, Real-time Image-based Motion Detection Using Color and Structure, M.S. in Computer Science, University of Texas at El Paso, December 2009.
5. Geovany Ramirez-Garcia, Face Detection using Machine Learning, M.S. in Computer Science, INAOE, March 2006.
6. Hugo Jair Escalante-Balderas, Noise-Aware Instance-Based Learning Algorithms, M.S. in Computer Science, INAOE, January 2006.
7. Topiltzin Flores-Lucero, Stereo Vision using Evolution Strategies, M.S. in Computer Science, INAOE, February 2005.
8. José Luis Saúl Malagón-Borja, Finding Pedestrians in Images, M.S. in Computer Science, INAOE, February 2005.
9. Luis Álvarez Ochoa, Determination of Stellar Population Parameters of Galaxies from Photometric Data Using Evolution Strategies, M.S. in Computer Science, INAOE, October 2004 (co-supervised with Roberto Terlevich).
10. Trilce Procyón Estrada Piedra, Automated Identification of Stellar Populations from Galactic Spectra, M.S. in Computer Science, INAOE, October 2004.
11. Antonio Salim Maza, Development of Local Vision-based Behaviors for a Robotic Soccer Player, M.S. in Computer Science, INAOE, September 2004 (co-supervised with Angélica Muñoz).
12. José Edgar Lara Ramírez, Robot Navigation and Map Construction Using Machine Learning and Probabilistic Models, M.S. in Computer Science, INAOE, February 2004.
13. Carmen Carlota Martínez Gil, Face Recognition using Template-based Methods and Unlabeled Data, M.S. in Computer Science, INAOE, January 2004.
14. Jorge de la Calleja Mora, Classification of Galaxy Images using Machine Learning and Image Analysis, M.S. in Computer Science, INAOE, September 2003.
15. María Teresa Orozco-Aguilera, Attribute Creation for the Estimation of Stellar Atmospheric Parameters, M.S. in Astrophysics, INAOE, December 2002.
16. Oscar Manuel Martínez-Lazalde, Reasoning with Incomplete Knowledge and an Application to the Game of Dominoes, M.S. in Computer Science, INAOE, December 2002.
17. Tamar Ivette Solorio Martínez, Using Unlabeled Data to Improve Classifier Accuracy, M.S. in Computer Science, INAOE, August 2002.
18. Juan Carlos Gómez-Carranza, Determination of the Orbital Parameters of Interacting Galaxies Using Evolution Strategies, M.S. in Astrophysics, INAOE, February 2002. (co-supervised with Ivanio Puerari).
19. Darío César Peregrina-Albores, Object Tracking with Active Vision, M.S. in Computer Science, INAOE, May 2002 (co-supervised with Leopoldo Altamirano and Miguel Arias).

B.S. Theses

1. Carmen Carlota Martínez Gil, Experimental Comparison of Classifiers for Face Classification, B.S in Computer Science, Benemérita Universidad Autónoma de Puebla, July 2002.
2. Jorge de la Calleja Mora, Morphological Classification of Galaxies Using Machine Learning, B.S in Computer Science, Benemérita Universidad Autónoma de Puebla, July 2002.

SERVICE AND HONORS

Academic Honors and Awards

- Advised student team that won second place (out of about 70 teams nationwide) in the Great Mind Challenge: Watson Technical Edition, a machine learning completion sponsored by IBM, April 2014.
- Best REU Site Poster - REU P.I. Meeting, Charlotte N.C., March 2010.
- Florida Artificial Intelligence Society - Best Poster Award, FLAIRS-19 Conference, May 2006.
- National Research System Fellowship (SNI). August 1998 - December 2007.
- National Council of Science and Technology (CONACYT), Mexico. Fellowship for Ph.D. studies at the University of Rochester, August 1992 - April 1997.
- National Science Foundation, U.S.A. Travel Award to Participate in the 1996 U.S.-Japan Graduate Student Forum in Robotics, Osaka, Japan, November 1996.
- Agency for International Development, U.S.A. Scholarship for M.S. Studies at the University of Texas at El Paso. September 1989- August 1991.

Professional Activities

Reviewing, Panels and Scientific Committees

1. Referee of Grant Proposals for:
 - National Science Foundation. (2008, 2009, 2010, 2011, 2012).
 - Mexican National Council for Science and Technology (CONACYT) (2000, 2001, 2002, 2003, 2004, 2005)
 - COMEXUS (Mexico-United States Commission for Educational and Cultural Exchange) (2002).
2. Reviewer of the journals:
 - International Journal on Artificial Intelligence Tools (IJAIT)
 - IEEE Transactions on Evolutionary Computation
 - IEEE Transactions on Autonomous Mental Development
 - Parallel Computing
 - Computación y Sistemas - Iberoamerican Journal for Computer Science Research
 - Machine Learning
 - Autonomous Robots
3. Member of the program committee of:
 - Florida Artificial Intelligence Research Society Conference (FLAIRS) 2005 - 2014

- Iberoamerican Congress on Pattern Recognition, 2002, 2004, 2006
 - Mexican International Conference on Artificial Intelligence, 2004, 2005, 2008, 2009, 2010, 2012
 - Iberoamerican Conference on Artificial Intelligence (IBERAMIA), 2004, 2006.
 - IASTED International Conference on Artificial Intelligence and Applications, 2002, 2003, 2004, 2005
 - IASTED International Conference on Artificial Intelligence and Soft Computing 2002, 2003, 2004, 2005
 - Congreso Internacional de Computación (CIC) 2002, 2003
 - SIBGRAPI (Brazilian Symposium on Computer Graphics and Image Processing) 2006
4. Member of the scientific review committee of:
 - Interspeech 2008.
 - Interspeech 2009.
 - Interspeech 2010.
 5. Co-chairman of First Iberoamerican Workshop on Machine Learning for Scientific Data Analysis (MLSDA), 2004
 6. Member of the organizing committee of
 - Iberoamerican Conference on Artificial Intelligence, 2004
 - Guillermo Haro Workshop on Violent Star Formation, 2004
 7. Member of the International Association of Science and Technology for Development (IASTED) Technical Committee on Artificial Intelligence and Expert Systems, 2001 – 2006
 8. Chair of the Data Mining Track of the Mexican International Conference on Artificial Intelligence, 2008 (MICAI 08).
 9. Chair of the Bioinformatics Track of the Mexican International Conference on Artificial Intelligence, 2009, 2010 (MICAI 09, MICAI 10).

University Committees

1. Department-level
 - Director of Graduate Programs 2011 - present
 - Chair of the Fundamentals Committee 2006-present
 - Faculty search committee 2009-2010
2. College-level
 - Faculty search committee 2009-2010
 - Pre-commencement organizing committee 2009
3. University-level
 - Faculty senate 2006-present
 - Top-ten senior selection 2008, 2009