

**Dr. Miguel Argaez**  
The University of Texas at El Paso  
Mathematical Sciences  
(915) 747-6775  
Email: margaez@utep.edu

## **Education**

Ph D, Rice University, 1997.  
Major: Computational and Applied Mathematics

MA, Rice University, 1995.  
Major: Computational and Applied Mathematics  
Supporting Areas of Emphasis: Numerical Optimization

MS, Universidad Nacional, 1987.  
Major: Advanced Mathematics

BS, Universidad del Valle, 1977.  
Major: Mathematics

## **Professional Memberships**

Society for the Advancement of Chicanos and Native Americans. (2007 - Present).

Society for Industrial and Applied Mathematics. (2006 - Present).

## **Development Activities Attended**

Workshop, "ARG Affinity Research Group Mini-Workshop," Affinity Research Group, El Paso, Texas. (May 1, 2009).

Workshop, "ARG Affinity Research Group Mini-Workshop," Affinity Research Group, El Paso, TX. (March 6, 2009).

## **Awards and Honors**

Academic and research excellence computational science, Computational science program. (December 6, 2013).

Best student paper award, NAFIPS international conference. (July 16, 2013).

Academic excellence award college of science, College of Science. (May 10, 2013).

Research excellence award college of science, College of Science. (May 10, 2013).

Second place best oral presentation. UTEP graduate research expo, UTEP graduate school. (November 9, 2012).

Dagua City Honor for His Top Achievements as a Mathematician and Scientist, Dagua City - Colombia. (July 2005).

## **TEACHING**

## Teaching Experience

### The University of Texas at El Paso

1 course.  
CPS 5396, Graduate Interdisciplinary Res, 1 course.  
CPS 5397, Graduate Research, 4 courses.  
CPS 5398, Graduate Thesis, 2 courses.  
CPS 5399, Graduate Thesis, 3 courses.  
CPS 6396, Graduate Research, 7 courses.  
CPS 6397, Doctoral Project, 4 courses.  
CPS 6398, Dissertation, 4 courses.  
CPS 6399, Dissertation, 3 courses.  
MATH 1312, Calculus II, 2 courses.  
MATH 1411, Calculus I, 2 courses.  
MATH 4399, Indiv Studies in Mathematics, 7 courses.  
MATH 5195, Graduate Seminar, 1 course.  
MATH 5311, Applied Mathematics, 2 courses.  
MATH 5329, Numerical Analysis, 1 course.  
MATH 5335, Techniques in Optimization, 1 course.  
MATH 5345, Numerical Optimization, 9 courses.  
MATH 5346, Interior-Point Methods for Lin, 2 courses.  
MATH 5370, Seminar, 15 courses.  
MATH 5396, Graduate Research, 3 courses.  
MATH 5398, Thesis, 1 course.  
MATH 5399, Thesis, 2 courses.  
MATH 6345, Topics in Optimization, 5 courses.  
RSRC 4033, Undergraduate Research, 1 course.

## Directed Student Learning

Dissertation Defense Committee Chair. (September 2009 - December 2013).  
Advised: Miguel Hernandez IV

Dissertation Committee Chair. (September 2008 - May 2013).  
Advised: Carlos Ramirez

Dissertation Committee Chair. (September 2008 - May 2013).  
Advised: Reinaldo Sanchez

Master's Thesis Committee Member, "COMPARATIVE INVESTIGATION OF COGNITIVE AND PRAGMATIC THINKING MODES LINEAR ALGEBRA." (September 2011 - April 2012).  
Advised: Enayat Kalantarian

Master's Thesis Committee Member, "Sparse Signal, Image Recovery in Compressive sensing technique through  $l_1$  norm minimization." (September 2011 - April 2012).  
Advised: Phanendra Koppiseti

Dissertation Committee Member. (2010 - 2011).  
Advised: Cristiano Miosso

Master's Thesis Committee Member, "A Reduced Order Parameter Estimation Technique Using Orthonormal Wavelets." (September 2009 - December 2011).  
Advised: Miguel Hernandez IV

Master's Thesis Committee Member, "Optimal Control Applied to Discrete Time Influenza Model." (September 2009 - December 2011).  
Advised: Paula Gonzalez Parra

Master's Thesis Committee Chair, "Digital Image Processing Based on Sparse Representation and Convex Programming." (September 2008 - December 2011).  
Advised: Carlos Ramirez

Master's Thesis Committee Chair. (September 2008 - May 2011).  
Advised: Reinaldo Sanchez

Master's Thesis Committee Member, "On Constrained Optimization Schemes for Joint Inversion of Geophysical Datasets." (September 2008 - May 2011).  
Advised: Anibal Sosa

Master's Thesis Committee Member, "San Miguel Volcanic Seismicity and Structure in Central America: Insight into the Physical Processes of Volcanoes." (April 2010 - September 2010).  
Advised: Ezer Patlan

Master's Thesis Committee Member. (September 2007 - December 2008).  
Advised: Cristhian Potes

Dissertation Defense Committee Member. (September 2006 - August 2008).  
Advised: Aldo Lucero

Master's Thesis Committee Chair. (September 2005 - August 1, 2007).  
Advised: Carlos A. Quintero

Master's Thesis Committee Member. (February 2006 - May 2006).  
Advised: Bikash Gautam

## RESEARCH

### Published Intellectual Contributions

#### Refereed Journal Articles

- Ramirez, C., Sanchez Arias, R., Kreinovich, V. Y., Argaez, M. (2014). Square Root of  $x^2 + \text{const}$  is the Most Computationally Efficient Smooth Approximation to  $|x|$ : a Proof. *To appear in Journal of Uncertain Systems*, 8.
- Ramirez, C., Sanchez, R., Kreinovich, V. Y., Argaez, M. (2014). Square Root of  $x^2 + \text{const}$  is the Most Computationally Efficient Smooth Approximation to  $|x|$ : a Proof. *Journal of Uncertain Systems*, 8(3), 205-210.
- Ramirez, C., Kreinovich, V. Y., Argaez, M. (2013). Why  $l_1$  Is a Good Approximation to  $l_0$ : A Geometric Explanation. *Journal of Uncertain Systems*, 7, 203-207.
- Argaez, M., Sanchez Arias, R., Villamarin, C. R. (2012). Face Recognition from Incomplete Measurements via  $l_1$ -minimization. *American Journal of Computational Mathematics AJCM*, 2(4), 287-294. [www.scirp.org/journal/PaperDownload.aspx?paperID=25586](http://www.scirp.org/journal/PaperDownload.aspx?paperID=25586)
- Argaez, M., Sanchez Arias, R., Villamarin, C. R. (2012). Face Recognition from Incomplete Measurements via  $l_1$ -minimization. *American Journal of Computational Mathematics AJCM*, 2(4), 287-294. [www.scirp.org/journal/PaperDownload.aspx?paperID=25586](http://www.scirp.org/journal/PaperDownload.aspx?paperID=25586)

- Ramirez, C., Gonzalez, G., Argaez, M., Guillen, P. Self-Organizing Maps in Seismic Image Segmentation. *To appear in Journal of Computer Technology Applications.*
- Sanchez, R., Ramirez, C., Argaez, M. Face Recognition from Incomplete Measurements via Sparse Representation. *To appear in American Journal of Computational Mathematics.*
- Quintero, C., Klie, H., Wheeler, M., Argaez, M., Velazquez, L. (2011). A Hybrid Algorithm for Global Optimization Problems. *Reliable Computing Journal*, 15(3), 230-241.
- Quintero, C., Klie, H., Wheeler, M., Argaez, M., Velazquez, L. (2011). A Hybrid Algorithm for Global Optimization Problems. *Reliable Computing Journal*, 15(3), 230-241.
- Argaez, M. (2011). Solving Overdetermined System in  $l_p$  Quasi-Norms. *Reliable Computing Journal*, 15(1), 13-25.
- Tolonen, E., Bueno, B., Kulshreshta, S., Cieplak, P., Stec, B., Argaez, M., Velazquez, L. (2011). Allosteric Transition and Binding of Small Molecule Effectors Causes Curvature Change in Central B-Sheets of Selected Enzymes. *Journal of Molecular Modeling*, 17(4), 899-911. [dx.doi.org/10.1007/s00894-010-0784-7](http://dx.doi.org/10.1007/s00894-010-0784-7)
- Tolonen, E., Bueno, B., Kulshreshta, S., Cieplak, P., Stec, B., Argaez, M., Velazquez, L. (2011). Allosteric Transition and Binding of Small Molecule Effectors Causes Curvature Change in Central B-Sheets of Selected Enzymes. *Journal of Molecular Modeling*, 17(4), 899-911. [dx.doi.org/10.1007/s00894-010-0784-7](http://dx.doi.org/10.1007/s00894-010-0784-7)
- Tolonen, E., Bueno, B., Kulshreshta, S., Cieplak, P., Stec, B., Argaez, M., Velazquez, L. (2010). Allosteric Transition and Binding of Small Molecule Effectors Causes Curvature Change in Central B-Sheets of Selected Enzymes. *Journal of Molecular Modeling*, 1-13. [dx.doi.org/10.1007/s00894-010-0784-7](http://dx.doi.org/10.1007/s00894-010-0784-7)
- Miosso, C. J., Quintero, C. C. A., Potes, C. M., Von Borries, R. F., Argaez, M., Velazquez, L. (2009). Compressive Sensing Reconstruction with Prior Information by Iteratively Reweighted Least-Squares. *IEEE Transactions on Signal Processing*, 57(6), 2424-2431. [www.signalprocessingsociety.org](http://www.signalprocessingsociety.org)
- Miosso, C. J., Quintero, C. C., Potes, C. M., Von Borries, R. F., Argaez, M., Velazquez, L. (2009). Compressive Sensing Reconstruction with Prior Information by Iteratively Reweighted Least-Squares. *IEEE Transactions on Signal Processing*, 57(6), 2424-2431. [www.signalprocessingsociety.org](http://www.signalprocessingsociety.org)
- Hernandez, J., Argaez, M., Velazquez, L. (2007). An Inexact Newton Interior-Point Algorithm for Nonlinear Programming. *Revista Colombiana de Matematicas*, 41(5), 197-220.
- Hernandez, J., Argaez, M., Velazquez, L. (2006). An Inexact Newton Interior-Point Algorithm for Nonlinear Programming. *Revista Colombiana de Matematica*, 41(5), 197-220.
- Tapia, R. A., Argaez, M., Velazquez, L. (2002). Numerical Comparisons of Path-Following Strategies for a Primal-Dual Interior-Point Method for Nonlinear Programming. *Journal of Optimization Theory and Applications*, 114(2), 255-272.
- Tapia, R. A., Argaez, M., Velazquez, L. (2002). Numerical Comparisons of Path-Following Strategies for a Primal-Dual Interior-Point Method for Nonlinear Programming. *Journal of Optimization Theory and Applications*, 114(2), 255-272.

Tapia, R. A., Argaez, M. (2002). On the Global Convergence of a Modified Augmented Lagrangian Line-search Interior-Point Newton Method for Nonlinear Programming. *114*(1), 1-25.

### **Conference Proceedings**

Sanchez Arias, R., Servin, C., Argaez, M. (2013). (pp. pp. 531-535). Joint World Congress of the International Fuzzy Systems Association and Annual Conference of the North American Fuzzy Information Processing Society IFSA/NAFIPS,

Sanchez Arias, R., Servin, C., Argaez, M. (2013). (pp. pp. 531-535). Joint World Congress of the International Fuzzy Systems Association and Annual Conference of the North American Fuzzy Information Processing Society IFSA/NAFIPS,

Guillen, P., Barrera, J., Martinez de Pison, M., Argaez, M., Velazquez, L. (2012). (pp. 121-125). Proc. of the 6th Euro American Conference on Telematics and Information Systems.

Ramirez, C., James, A., Argaez, M., Tweedie, C. E. (2012).. Orlando, FL: IEEE International Conference in Image Processing.

Barrera, J., Martinez de Pison, M., Guillen, P., Argaez, M., Velazquez, L. (2012). (pp. 121-125). Proceedings of the 6th Euro American Conference on Telematics and Information Systems.

Guillen, P., Martinez de Pison, M., Sancez, R., Argaez, M., Velazquez, L. (2011). (pp. 7949-7952). IEEE International Conference Proceedings of Engineering in Medicine and Biology Society.

Hernandez IV, M., Sanchez, R., Ramirez, C., Olaya, J., Velazquez, L., Argaez, M., Romero, R. A. (2011).. IEEE CS Proceedings of the DoD HPCMP Users Group Conferenc.

Hernandez IV, M., Sanchez, R., Ramirez, C., Olaya, J., Velazquez, L., Argaez, M., Romero, R. A. (2011).. IEEE CS Proceedings of the DoD HPCMP Users Group Conferenc.

Sanchez Arias, R., Argaez, M., Guillen, P. (2011). (pp. 3362-3366). Boston, MA: IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society.

Sanchez Arias, R., Argaez, M., Villamarin, C. R. (2011). (pp. 1-6). Fuzzy Information Processing Society (NAFIPS), 2011 Annual Meeting of the North American.

Sanchez Arias, R., Argaez, M., Villamarin, C. R. (2011). (pp. 1-6). Fuzzy Information Processing Society (NAFIPS), 2011 Annual Meeting of the North American.

Martinez de Pison, M., Sanchez, R., Guillen, P., Argaez, M., Velazquez, L. (2011). (pp. 7949-7952). IEEE International Conference Proceedings of Engineering in Medicine and Biology Society.

Sanchez, R., Argaez, M., Guillen, P. (2011). (pp. 3362-3366). IEEE International Conference Proceedings of Engineering in Medicine and Biology Society.

Ramirez, C., Sanchez, R., Argaez, M. (2011). (pp. 1-6). IEEE Proceedings of the North American Fuzzy Information Processing Society.

Sanchez, R., Ramirez, C., Hernandez IV, M., Culbret, M., Jameson, A., Velazquez, L., Argaez, M. (2010). (pp. 149-154). Los Alamitos, CA: IEEE Annual Proceedings of the DoD HPCMP Users Group Conference (Refereed Article).

Sanchez, R., Ramirez, C., Hernandez IV, M., Culbret, M., Jameson, A., Velazquez, L., Argaez, M. (2010). (pp. 149-154). Los Alamitos, CA: IEEE Annual Proceedings of the DoD HPCMP Users Group Conference (Refereed Article).

Hernandez IV, M., Velazquez, L., Argaez, M. (2010). (pp. 71-76). Los Alamitos, CA: IEEE Annual Proceedings of the DoD HPCMP Users Group Conference (Refereed Article).

Quintero, C. A., Klie, H., Wheeler, M. F., Argaez, M., Velazquez, L. (2009).. Proceedings of the 26th Army Science Conference.

Quintero, C. A., Klie, H., Wheeler, M. F., Argaez, M., Velazquez, L. (2009).. Proceedings of the 26th Army Science Conference.

Klie, H., Quintero, C., Wheeler, M., Argaez, M., Velazquez, L. (2007). (vol. 7, pp. 1062507 - 1062508). 6th International Congress on Industrial and Applied Mathematics.

Klie, H., Quintero, C., Wheeler, M., Argaez, M., Velazquez, L. (2007). (vol. 7, pp. 1062507-1062508). Zurich: PAMM Journal 6th International Congress on Industrial and Applied Mathematics.

Bueno, B., Stec, B., Velazquez, L., Argaez, M. (2005). (pp. 1-3). IEEE-CS Association of Computing Machinery New York: Proceedings of the Conference on Diversity in Computing.

Bueno, B., Stec, B., Velazquez, L., Argaez, M. (2005). (pp. 1-3). Association of Computing Machinery New York: IEEE-CS: Proceedings of the 2005 Conference on Diversity in Computing.

Bueno, B., Stec, B., Velazquez, L., Argaez, M. (2005). (pp. 1-3). IEEE-CS Association of Computing Machinery New York: Proceedings of the Conference on Diversity in Computing.

Lucero, A., Aguirre, A., Vidal Jr, E., Cabrera, S. D., Argaez, M. (2004). (vol. 4, pp. 2514-2517). IEEE Proceedings of the Geoscience and Remote Sensing Symposium.

Argaez, M., Velazquez, L. (2003). (pp. 12-14). Association of Computing Machinery, New York: Proceedings of the Conference on Diversity in Computing.

Velazquez, L., Argaez, M. (2003). (pp. 12-14). Association of Computing Machinery, New York: Proceedings of the Conference on Diversity in Computing.

Villalobos, C., Argaez, M., Velazquez, L. (2003). (pp. 15-17). Association of Computing Machinery, New York: Proceedings of the Conference on Diversity in Computing.

Villalobos, C., Argaez, M., Velazquez, L. (2003). (pp. 15-17). Association of Computing Machinery, New York: Proceedings of the Conference on Diversity in Computing.

Villalobos, C., Argaez, M., Velazquez, L. (2003). (pp. 15-17). Association of Computing Machinery, New York: Proceedings of the Conference on Diversity in Computing.

#### **Other**

Sosa, A., Thompson, L. E., Velazquez, L., Velasco, A. A., Argaez, M. (2011). (pp. Abstract S43D-01). San Francisco, CA: Eos Trans. AGU, Fall Meet. Suppl.

Sosa, A., Thompson, L. E., Velazquez, L., Velasco, A. A., Argaez, M. (2011). (pp. Abstract S43D-01). Eos Trans. AGU, Fall Meet. Suppl.

Sosa, A., Thompson, L. E., Velazquez, L., Velasco, A. A., Argaez, M. (2011). (pp. Abstract S43D-01). Eos Trans. AGU, Fall Meet. Suppl.

## Invited Presentations

Argaez, M. (Author Only), Ramirez, C. (Presenter & Author), Society for Industrial and Applied Mathematics on Imaging Science, "An l1 Minimization Algorithm with Applications in Image Processing," SIAM, Philadelphia, PA. (May 2012).

Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Author Only), Army High-Performance Computing Research Center Annual Meeting, "Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (August 2011).

Velazquez, L. (Author Only), Argaez, M. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Presenter & Author), Army High-Performance Computing Research Center Annual Meeting, "Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (August 2011).

Velazquez, L. (Author Only), Argaez, M. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Presenter & Author), Army High-Performance Computing Research Center Annual Meeting, "Poster-Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (August 2011).

Argaez, M. (Author Only), Ramirez, C. (Presenter & Author), 7th International Congress on Industrial and Applied Mathematics, "An l1 Minimization Algorithm for Sparse Representation Problems in Image Processing," Vancouver, Canada. (July 2011).

Argaez, M. (Author Only), Sanchez, R. (Presenter & Author), 7th International Congress on Industrial and Applied Mathematics, "Sparse Representation for Classification Problems," Vancouver, Canada. (July 2011).

Sosa, A. (Presenter & Author), Velazquez, L. (Author Only), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), American Geophysical Union Annual Meeting, "A Study of Regularization and Interior-Point Methods for Optimizing Joint Inversion of Geophysical Datasets," Association of Geophysical Union, San Francisco, CA. (December 2010).

Argaez, M. (Author Only), Ramirez, C. (Presenter & Author), Sanchez, R. (Presenter & Author), 6th Blackwell- Tapia Conference, "An Algorithm for Constrained l1-Minimization Problems and Applications," Columbus, OH. (November 2010).

Ramirez, C. (Presenter & Author), Argaez, M. (Author Only), 8th Joint UTEP/NMSU Workshop on Mathematics, Computer Science, and Computational Sciences, "Convex Optimization in Digital Image Processing," UTEP-NMSU, El Paso, TX. (November 2010).

Argaez, M., International Conference on Applied Mathematics and Informatics, "An Algorithm for Constrained l1-Minimization Problems and Applications," The International Council for Industrial and Applied Mathematics (ICIAM), the International Mathematical Union (IMU), San Andres, Colombia. (November 2010).

Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Culbreth, M. (Author Only), Reinaldo, S. (Author Only), Carlos, R. (Author Only), Miguel, H. I. (Author Only), International Conference on Applied Mathematics and Informatics, "Hybrid Optimization Schemes for Global Optimization: Wing Modeling of Micro-Aerial Vehicles," The International Council for

- Industrial and Applied Mathematics (ICIAM), the International Mathematical Union (IMU), San Andres, Colombia. (November 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Culbreth, M. (Author Only), Reinaldo, S. (Author Only), Carlos, R. (Author Only), Miguel, H. I. (Author Only), International Conference on Applied Mathematics and Informatics, "Hybrid Optimization Schemes for Global Optimization: Wing Modeling of Micro-Aerial Vehicles," The International Council for Industrial and Applied Mathematics (ICIAM), the International Mathematical Union (IMU), San Andres, Colombia. (November 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Sanchez, R. (Presenter & Author), Argaez, M. (Presenter & Author), Ramirez, C. (Author Only), Supercomputing Conference, "Hybrid Optimization Schemes for Global Optimization," Asociation for Computing Machinery, IEEE-Computer Science, New Orleans, LA. (November 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Sanchez, R. (Presenter & Author), Argaez, M. (Presenter & Author), Ramirez, C. (Author Only), Supercomputing Conference, "Hybrid Optimization Schemes for Global Optimization," Asociation for Computing Machinery, IEEE-Computer Science, New Orleans, LA. (November 2010).
- Sosa, A. (Presenter & Author), Velazquez, L. (Author Only), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), 8th Joint UTEP/NMSU Workshop on Mathematics, Computer Science, and Computational Sciences, "A Study of Regularization and Interior-Point Methods for Optimizing Joint Inversion of Geophysical Datasets," UTEP-NMSU, El Paso, TX. (September 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Author Only), Army High-Performance Computing Research Center Annual Meeting, "Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (August 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Author Only), Army High-Performance Computing Research Center Annual Meeting, "Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (August 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Sanchez, R. (Author Only), Ramirez, C. (Author Only), Hernandez IV, M. (Author Only), Culbreth, M. (Author Only), 24th European Conference on Operations Research, "A Hybrid Algorithm for Global Optimization Problems," Lisbon, Portugal. (July 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Sanchez, R. (Author Only), Ramirez, C. (Author Only), Hernandez IV, M. (Author Only), Culbreth, M. (Author Only), 24th European Conference on Operations Research, "A Hybrid Algorithm for Global Optimization Problems," Lisbon, Portugal. (July 2010).
- Velazquez, L. (Presenter & Author), Sosa, A. (Author Only), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), EUROPT Workshop on Advances in Continuous Optimization, "A Study of Regularization and Interior-Point Methods for Optimizing Joint Inversion of Geophysical Datasets," University of Aveiro, Aveiro, Portugal. (July 2010).
- Velazquez, L. (Author Only), Sosa, A. (Presenter & Author), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), Society of Industrial and Applied Mathematics Annual Meeting, "A Study of Regularization and Interior-Point Methods for Optimizing Joint

- Inversion of Geophysical Datasets," Society of Industrial and Applied Mathematics, Pittsburgh, PA, (July 2010).
- Velazquez, L. (Presenter & Author), Sosa, A. (Author Only), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), VII Pan-American Workshop Applied and Computational Mathematics, "A Study of Regularization and Interior-Point Methods for Optimizing Joint Inversion of Geophysical Datasets," San Diego State University and Universidad Central de Venezuela, Choroní, Venezuela. (July 2010).
- Argaez, M., VII Pan-American, "A Path Following Method for  $l_1$  Minimization and Applications," San Diego State University and Universidad Central de Venezuela, Choroní, Venezuela. (July 12, 2010).
- Hernandez IV, M. (Presenter & Author), Velazquez, L. (Author Only), Argaez, M. (Author Only), DoD Users Group High-Performance Computing Modernization Program, "A Comparison of Wavelet-Based Schemes for Parameter Estimation," Department of Defense, Schaumburg, Illinois. (June 2010).
- Hernandez IV, M. (Presenter & Author), Velazquez, L. (Author Only), Argaez, M. (Author Only), DoD Users Group High-Performance Computing Modernization Program, "A Comparison of Wavelet-Based Schemes for Parameter Estimation," Department of Defense, Schaumburg, Illinois. (June 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Culbreth, M. (Author Only), Sanchez, R. (Author Only), Ramirez, C. (Author Only), Hernandez IV, M. (Author Only), DoD Users Group High-Performance Computing Modernization Program, "Hybrid Optimization schemes for Wing Modeling of Micro-Aerial Vehicles," Department of Defense, Schaumburg, Illinois. (June 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Culbreth, M. (Author Only), Sanchez, R. (Author Only), Ramirez, C. (Author Only), Hernandez IV, M. (Author Only), DoD Users Group High-Performance Computing Modernization Program, "Hybrid Optimization schemes for Wing Modeling of Micro-Aerial Vehicles," Department of Defense, Schaumburg, Illinois. (June 2010).
- Sosa, A. (Presenter & Author), Velazquez, L. (Author Only), Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), Thompson, L. (Author Only), 7th Joint UTEP/NMSU Workshop on Mathematics, Computer Science, and Computational Sciences, "An Optimization Method on Joint Inversion of Different Types of Seismic Data," UTEP-NMSU, Las Cruces, NM. (April 2010).
- Hernandez IV, M. (Presenter & Author), Velazquez, L. (Author Only), Argaez, M. (Author Only), Minority Serving Institutions Research Partnership Consortium, "A Comparison of Wavelet-Based Schemes for Parameter Estimation," Morgan State University, Baltimore, MD. (April 2010).
- Hernandez IV, M. (Presenter & Author), Velazquez, L. (Author Only), Argaez, M. (Author Only), Minority Serving Institutions Research Partnership Consortium, "A Comparison of Wavelet-Based Schemes for Parameter Estimation," Morgan State University, Baltimore, MD. (April 2010).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Klie, H. (Author Only), Wheeler, M. (Author Only), Multiphysics Conference, "A Hybrid Optimization Algorithm for Global Optimization," Multiphysics Organization, Lille, France. (December 2009).

- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Klie, H. (Author Only), Wheeler, M. (Author Only), Multiphysics Conference, "A Hybrid Optimization Algorithm for Global Optimization," Multiphysics Organization, Lille, France. (December 2009).
- Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Ramirez, C. (Presenter & Author), Supercomputing Conference, "A Path Following Method for Large Scale I1 Underdetermined Problems," IEEE, ACM, Portland, OR. (November 2009).
- Ramirez, C. (Presenter Only), Argaez, M. (Author Only), Velazquez, L. (Author Only), UTEP and NMSU Workshop, "The Notion of Quasicentral Path in Linear Programming," UTEP, El Paso, TX. (November 2009).
- Ramirez, C. (Presenter Only), Argaez, M. (Author Only), Velazquez, L. (Author Only), UTEP and NMSU Workshop, "The Notion of Quasicentral Path in Linear Programming," UTEP, El Paso, TX. (November 2009).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Klie, H. (Author Only), Wheeler, M. (Author Only), Computational Science Distinguished Lecture-Colloquium, "A Hybrid Optimization Algorithm for Solving Global Optimization Problems," Texas A&M-Commerce, Commerce, TX. (October 2009).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Klie, H. (Author Only), Wheeler, M. (Author Only), Computational Science Distinguished Lecture-Colloquium, "A Hybrid Optimization Algorithm for Solving Global Optimization Problems," Texas A&M-Commerce, Commerce, TX. (October 2009).
- Velazquez, L. (Presenter & Author), Argaez, M., quintero, c., klie, h., wheeler, m., International Mathematical Programming Society, "A Hybrid Optimization Algorithm for Global Optimization," Mathematical Programming Society, Chicago, ILL. (August 2009).
- Velazquez, L. (Presenter & Author), Argaez, M., quintero, c., klie, h., wheeler, m., International Mathematical Programming Society, "A Hybrid Optimization Algorithm for Global Optimization," Mathematical Programming Society, Chicago, ILL. (August 2009).
- Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), Ramirez, C. (Author Only), XVII Congreso Colombiano de Matematicas, "A Path Following Method for Large Scale I\_1 Underdetermined Problems," Sociedad Colombiana de matematicas, Cali, Colombia. (August 2009).
- Ramirez, C. (Presenter Only), Argaez, M. (Author Only), Velazquez, L. (Author Only), XVII Congreso Colombiano de Matematicas, "The Notion of Quasicentral Path in Linear Programming," Sociedad Colombiana de matematicas, Cali-Colombia. (August 2009).
- Argaez, M. (Presenter & Author), Army High-Performance Computing Research Center Annual Meeting, "A Path Following Method for Large Scale I\_1 Underdetermined Problems," Army High Performance Research Center, Stanford University, Palo Alto, California. (June 2009).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Author Only), Army High-Performance Computing Research Center Annual Meeting, "Hybrid Optimization Schemes for Parameter Estimation Problems," Army High Performance Research Center, Stanford University, Palo Alto, CA. (June 2009).
- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Ramirez, C. (Author Only), Sanchez, R. (Author Only), Army High-Performance Computing

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- Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Ramirez, C. (Author Only), SACNAS Research Expo, "A Path Following Method for Large Scale I1 Underdetermined Problems," UTEP SACNAS Chapter, El Paso, TX. (April 2009).
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- Gonzalez-Parra, P. (Presenter & Author), Velazquez, L. (Author Only), Argaez, M. (Author Only), Castillo-Chavez, C. (Author Only), Fenichel, E. (Author Only), New Mexico Bioinformatics Symposium, "Computational Methods in Infectious Diseases," IDEa Networks of Biomedical Research Excellence, Santa Fe, NM. (March 2009).
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- Velazquez, L., Argaez, M. (Author Only), Saenz, R. (Author Only), International Conference on Continuous Optimization, "A Trust-Region Interior-Point Algorithm for Nonnegative Constrained Minimization," Mathematical Programming Society, Troy, NY. (August 2004).
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- Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Saenz, R. (Author Only), SIAM Annual Meeting-Diversity Day, "An inexact Newton interior-point algorithm for nonnegative constrained minimization," Society of Industrial and Applied Mathematics, Montreal, Canada. (July 2003).
- Velazquez, L. (Author Only), Argaez, M. (Presenter & Author), Villalobos, C. (Author Only), SIAM Annual Meeting-Diversity Day, "On the Development of an Interior-Point Trust-Region Algorithm for Solving Nonlinear Programs," Society of Industrial and Applied Mathematics, Montreal, Canada. (July 2003).
- Velazquez, L. (Author Only), Argaez, M. (Presenter & Author), Villalobos, C. (Author Only), American Mathematical Society, "On the Development of an Interior-Point Trust-Region Algorithm for Solving Nonlinear Programs," AMS, El Paso, TX. (May 2003).
- Velazquez, L. (Author Only), Argaez, M. (Presenter & Author), Villalobos, C. (Author Only), American Mathematical Society, "On the Development of an Interior-Point Trust-Region Algorithm for Solving Nonlinear Programs," AMS, El Paso, TX. (May 2003).
- Velazquez, L. (Presenter & Author), Argaez, M., "Nonlinear Programming," Army Research Laboratory, White Sands, NM. (July 2001).
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Velazquez, L. (Presenter & Author), Argaez, M. (Author Only), Tapia, R. (Author Only), Math Colloquium, "Numerical Comparisons of Path-Following Strategies for a Basic Interior-Point Method for Nonlinear Programming," Department of Mathematical Sciences, University of Texas at El Paso, El Paso, TX. (November 2000).

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## Contributed Presentations

Ramirez, C. (Author Only), Argaez, M. (Author Only), James, A. (Author Only), Tweedie, C. E. (Author Only), IEEE International Conference in Image Processing, "Image Inpainting in Micrometeorological Analysis," Orlando, FL. (October 2012).

Argaez, M. (Author Only), Sanchez, R. (Presenter & Author), Society for Industrial and Applied Mathematics Annual Meeting, "A Dimensionality Reduction and Sparse Representation Approach for Classification," SIAM, Minneapolis, MN. (July 2012).

Sosa, A. (Presenter & Author), Velazquez, L., Velasco, A. (Author Only), Argaez, M. (Author Only), Romero, R. (Author Only), American Geophysical Union, "Constrained Optimization Framework for Joint Inversion of Geophysical Data Sets," San Francisco, CA. (December 2011).

Sosa, A. (Presenter & Author), Velazquez, L., Velasco, A. (Author Only), Argaez, M. (Author Only), Romero, R. (Author Only), Doctoral UTEP Workshop, "Constrained Optimization Framework for Joint Inversion of Geophysical Data Sets," UTEP Graduate School, El Paso, TX. (November 2011).

Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), Guillen, P. (Author Only), Velazquez, L., IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society, "Characterization of Subcortical Structures during Deep Brain Stimulation utilizing Support Vector Machines," IEEE, Boston, MA. (August 2011).

Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society, "Sparse Representation via  $l_1$ -minimization for Underdetermined Systems in Classification of Tumors with Gene Expression Data," IEEE, Boston, MA. (August 2011).

Sosa, A. (Presenter & Author), Velazquez, L., Velasco, A. A. (Author Only), Argaez, M. (Author Only), Romero, R. A. (Author Only), Society of Industrial and Applied Mathematics Annual Meeting, "A Study of Regularization and Interior-Point Methods for Optimizing Joint Inversion of Geophysical Data Sets," Pittsburg, PA. (July 2011).

Argaez, M. (Author Only), Sanchez, R. (Presenter & Author), North American Fuzzy Information Processing Society, "An  $l_1$ -algorithm for Underdetermined Systems and Applications," El Paso, TX. (March 2011).

Ramirez, C. (Presenter Only), Argaez, M. (Author Only), Velazquez, L. (Author Only), 6th Joint UTEP/NMSU Work- shop on Mathematics, Computer Science and Computational Sciences, "The Notion of Quasicentral Path in Linear Programming," UTEP and NMSU, El Paso, TX. (November 2009).

Sosa, A. (Presenter Only), Velazquez, L. (Author Only), Burstede, C. (Author Only), Argaez, M. (Author Only), Ghattas, O. (Author Only), Society of Industrial and Applied Mathematics

- Annual Meeting, "Numerical Comparison of PDE Constrained Optimization Scheme for solving One Dimensional Earthquake Modeling Problems," Society of Industrial and Applied Mathematics, Denver, CO. (July 2009).
- Sanchez, R. (Presenter & Author), Argaez, M. (Author Only), Quintero, C. (Author Only), Ramirez, C. (Presenter & Author), Velazquez, L., Supercomputing Conference, "Parallel Global Optimization Schemes for Solving Parameter Estimation Problems.," IEEE, ACM, Austin, TX. (November 2008).
- Velazquez, L. (Author Only), M. B. (Presenter & Author), Argaez, M. (Author Only), Hallberg, J. (Author Only), Conference on Mathematical and Geophysical Issues in the Geosciences, "Parameter Estimation Schemes for Solving ADH Groundwater Models," Society of Industrial and Applied Mathematics, Santa Fe, NM. (March 2007).
- Velazquez, L. (Author Only), M. B. (Presenter & Author), Argaez, M. (Author Only), Hallberg, J. (Author Only), Conference on Mathematical and Geophysical Issues in the Geosciences, "Parameter Estimation Schemes for Solving ADH Groundwater Models," Society of Industrial and Applied Mathematics, Santa Fe, NM. (March 2007).
- Argaez, M. (Author Only), Velazquez, L. (Author Only), Noriega, A. (Presenter & Author), International SIAM Meeting in Optimization, "A Numerical Comparison of the Normal and Augmented Equations in Argaez's Predictor-Corrector Linear Programming," Society of Industrial and Applied Mathematics, Stockholm, Sweden. (May 2005).
- Argaez, M. (Author Only), Velazquez, L. (Author Only), Noriega, A. (Presenter & Author), International SIAM Meeting in Optimization, "A Numerical Comparison of the Normal and Augmented Equations in Argaez's Predictor-Corrector Linear Programming," Society of Industrial and Applied Mathematics, Stockholm, Sweden. (May 2005).
- Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), International SIAM Meeting in Optimization, "On a Global Optimization Technique for Solving a Nonlinear Hyperboloid Least Squares Problem," Society of Industrial and Applied Mathematics, Stockholm, Sweden. (May 2005).
- Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), International SIAM Meeting in Optimization, "On a Global Optimization Technique for Solving a Nonlinear Hyperboloid Least Squares Problem," Society of Industrial and Applied Mathematics, Stockholm, Sweden. (May 2005).
- Velazquez, L. (Presenter & Author), Bueno, B. (Author Only), Argaez, M. (Author Only), Career Workshop on Minorities, "On a Global Optimization Technique for Solving a Nonlinear Hyperboloid Least Squares Problem," The Institute of Mathematics and Applications, Minnesota, IN. (April 2005).
- Velazquez, L. (Presenter & Author), Bueno, B. (Author Only), Argaez, M. (Author Only), Career Workshop on Minorities, "On a Global Optimization Technique for Solving a Nonlinear Hyperboloid Least Squares Problem," The Institute of Mathematics and Applications, Minnesota, IN. (April 2005).
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- Argaez, M. (Author Only), Velazquez, L. (Author Only), Noriega, A. (Presenter & Author), UTEP Student Expo, "A Numerical Comparison of the Normal and Augmented Equations in Argaez's Predictor-Corrector Linear Programming," UTEP, El Paso, TX. (April 2005).

Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), 14th Annual Molecular Biophysics Program Research Conference, "Solving a Nonzero Residual Nonlinear Hyperboloid Least Squares Problem," W.M. Keck Center, NASA Clear Lake, TX. (October 2004).

Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), 14th Annual Molecular Biophysics Program Research Conference, "Solving a Nonzero Residual Nonlinear Hyperboloid Least Squares Problem," W.M. Keck Center, NASA Clear Lake, TX. (October 2004).

Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), New Mexico AGEP Annual Meeting, "Solving a Nonzero Residual Nonlinear Hyperboloid Least Squares Problem," New Mexico State University, Las Cruces, NM. (October 2004).

Velazquez, L. (Author Only), Bueno, B. (Presenter & Author), Argaez, M. (Author Only), New Mexico AGEP Annual Meeting, "Solving a Nonzero Residual Nonlinear Hyperboloid Least Squares Problem," New Mexico State University, Las Cruces, NM. (October 2004).

Argaez, M. (Author Only), Nunez, I. (Presenter & Author), Velazquez, L. (Author Only), UTEP Student Expo, "Numerical Methods and Experimentation of Iterative Methods and Preconditioners for Solving Linear Systems," UTEP, El Paso, TX. (April 2004).

Argaez, M. (Author Only), Nunez, I. (Presenter & Author), Velazquez, L. (Author Only), UTEP Student Expo, "Numerical Methods and Experimentation of Iterative Methods and Preconditioners for Solving Linear Systems," UTEP, El Paso, TX. (April 2004).

Argaez, M. (Author Only), Nunez, I. (Presenter & Author), Velazquez, L. (Author Only), Conference for the Advancement of Science Teaching, "Numerical Methods and Experimentation of Iterative Methods and Preconditioners for Solving Linear Systems," UTEP, El Paso, TX. (November 2002).

Argaez, M. (Author Only), Nunez, I. (Presenter & Author), Velazquez, L. (Author Only), Conference for the Advancement of Science Teaching, "Numerical Methods and Experimentation of Iterative Methods and Preconditioners for Solving Linear Systems," UTEP, El Paso, TX. (November 2002).

## **Contracts, Grants and Sponsored Research**

### **Contract**

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "3D Survey Design Modeling Evaluation for REPSOL," Sponsored by Other, Industry, \$131,042.00. (April 15, 2012 - December 31, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Seismic Classification Evaluation for Repsol," Sponsored by Other, Industry, \$123,959.00. (April 15, 2012 - December 31, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "3D Survey Design Modeling Evaluation for REPSOL," Sponsored by Other, Industry, \$185,000.00. (April 14, 2011 - April 14, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Seismic Classification Evaluation for Repsol," Sponsored by Other, Industry, \$175,000.00. (April 14, 2011 - April 14, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Seismic Classification Evaluation for Repsol," Sponsored by Other, Industry, \$360,000.00. (April 14, 2011 - April 14, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$226,999.00. (January 1, 2011 - March 31, 2012).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$326,999.00. (January 1, 2011 - March 31, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Automated Parameter Estimation and Sensitivity Schemes," Federal, \$39,267.00. (June 1, 2008 - May 31, 2009).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Automated parameter estimation and sensitivity schemes," Federal, \$39,267.00. (June 1, 2008 - May 31, 2009).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by ARMY, Federal, \$172,146.00. (January 1, 2008 - December 31, 2008).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by ARMY, Federal, \$172,146.00. (January 1, 2008 - December 31, 2008).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Automated Parameter Estimation and Sensitivity Schemes," Sponsored by Other, Federal, \$37,276.00. (June 1, 2007 - May 31, 2008).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Automated parameter estimation and sensitivity schemes," Sponsored by Other, Federal, \$37,276.00. (June 1, 2007 - May 31, 2008).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Automated Parameter Estimation and Sensitivity Schemes," Federal, \$40,000.00. (June 1, 2006 - May 31, 2007).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Automated parameter estimation and sensitivity schemes," Federal, \$40,000.00. (June 1, 2006 - May 31, 2007).

Velazquez, L. (Principal), Argaez, M. (Co-Principal), "A Trust-Region Interior-Point Path-following Algorithm for Large Scale Optimization," Sponsored by Other, Federal. (January 1, 2004 - January 1, 2007).

## **Educational**

Yi, S.-Y. (Supporting), Velazquez, L. (Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Doser, D. I. (Co-Principal), Gates, A. C. (Co-Principal), Nazarian, S. (Supporting), Argaez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Kreinovich, V. Y. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), "IGERT UTEP program on Multiphysics Problems in Engineering and Geoscience," Federal.

Yi, S.-Y. (Supporting), Velazquez, L. (Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Doser, D. I. (Co-Principal), Nazarian, S. (Co-Principal), Argaez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Shokouhi, P. (Supporting), Kreinovich, V. Y. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), "IGERT: Multiphysics Problems in Engineering and Geoscience," Federal.

Velazquez, L. (Principal), Villalobos, C. (Co-Principal), Argaez, M. (Supporting), "Curricula and Research Development in Applied Mathematics," Sponsored by Other, \$3,000.00. (January 2001 - August 2001).

Velazquez, L. (Principal), Villalobos, C. (Co-Principal), Argaez, M. (Supporting), "Curricula and Research Development in Applied Mathematics," Sponsored by Other, \$3,000.00. (January 2001 - August 2001).

## Equipment

Velazquez, L. (Supporting), Argaez, M. (Supporting), ghattas, o. (Principal), boisseau, j. (Co-Principal), "ICES MRI: Acquisition of a High Performance Computing System for Online Simulation," Sponsored by Other, Federal, \$90,000.00. (September 1, 2006 - August 31, 2009).

Velazquez, L. (Supporting), Argaez, M. (Supporting), ghattas, o. (Principal), boisseau, j. (Co-Principal), "ICES MRI: Acquisition of a High Performance Computing System for Online Simulation," Sponsored by Other, Federal, \$90,000.00. (September 1, 2006 - August 31, 2009).

## Grant

Yi, S.-Y. (Supporting), Velazquez, L. (Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Doser, D. I. (Co-Principal), Gates, A. C. (Co-Principal), Nazarian, S. (Supporting), Argaez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Kreinovich, V. Y. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), "IGERT UTEP program on Multiphysics Problems in Engineering and Geoscience," Federal.

Velazquez, L. (Supporting), Doser, D. (Co-Principal), Lopez, J. A. (Principal), Argaez, M. (Supporting), Velasco, A. A. (Supporting), "NSF CREST-Computational Development to Reconcile Uncertainty Propagation and Evaluation in Geophysical Problems," Sponsored by NSF, Federal.

Gates, A. C. (Principal), Velasco, A. A. (Co-Principal), Tweedie, C. E. (Co-Principal), Pennington, D. D. (Co-Principal), Villanueva-Rosales, N. (Supporting), Velazquez, L. (Supporting), Argaez, M. (Supporting), "CREST PHASE II: CYBER-SHARE CENTER OF EXCELLENCE," Sponsored by NSF, Federal, \$5,000,000.00. (September 2012 - August 2017).

Yi, S.-Y. (Supporting), Velazquez, L. (Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Doser, D. I. (Co-Principal), Gates, A. C. (Co-Principal), Nazarian, S. (Supporting), Argaez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Kreinovich, V. Y. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), "IGERT UTEP program on Multiphysics Problems in Engineering and Geoscience," Federal. (August 2011 - July 2016).

Velazquez, L. (Principal), Gates, A. C. (Co-Principal), Kumar, V. (Co-Principal), Hurtado, J. M. (Co-Principal), Doser, D. I. (Co-Principal), Argaez, M. (Supporting), Kreinovich, V. Y. (Supporting), Ceberio, M. C. (Supporting), Konter, B. R. (Supporting), Nazarian, S. (Supporting), Pownuk, A. M. (Supporting), Cabrera, S. D. (Supporting), "NSF IGERT: Mutep for solving multiphysics problems," Sponsored by NSF, Federal. (July 1, 2010 - August 31, 2015).

Yi, S.-Y. (Supporting), Velazquez, L. (Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Doser, D. I. (Co-Principal), Nazarian, S. (Co-Principal), Argæez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Shokouhi, P. (Supporting), Kreinovich, V. Y. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), "IGERT: Multiphysics Problems in Engineering and Geoscience," Federal. (August 2010 - July 2015).

## Research

Velazquez, L. (Principal), Doser, D. I. (Co-Principal), Gates, A. C. (Co-Principal), Hurtado, J. M. (Co-Principal), Kumar, V. (Co-Principal), Argæez, M. (Supporting), Cabrera, S. D. (Supporting), Ceberio, M. C. (Supporting), Espiritu Nolasco, J. F. (Supporting), Konter, B. R. (Supporting), Kreinovich, V. Y. (Supporting), Nazarian, S. (Supporting), Pownuk, A. M. (Supporting), Taboada Jimenez, H. A. (Supporting), Yi, S.-Y. (Supporting), "IGERT: "muTEP" Program for Solving Multiphysics Problems in Engineering and Geoscience," Sponsored by NSF, Federal.

Velazquez, L. (Supporting), Doser, D. (Co-Principal), Lopez, J. A. (Principal), Argæez, M. (Supporting), Velasco, A. A. (Supporting), "NSF CREST-Computational Development to Reconcile Uncertainty Propagation and Evaluation in Geophysical Problems," Sponsored by NSF, Federal.

Wheeler, M. F. (Principal), Velazquez, L. (Supporting), Gates, A. (Supporting), Argæez, M. (Supporting), "NSF Engineering Center: The Center for Geosystems Engineering Mangement (C-GEM)," Sponsored by Other, Federal.

Velazquez, L. (Co-Principal), Argæez, M. (Supporting), "NSF Engineering Research Center, "Center for Information Suffused Systems Engineering," Sponsored by Other, Federal.

Velazquez, L. (Principal), Gates, A. C. (Co-Principal), Kumar, V. (Co-Principal), Hurtado, J. M. (Co-Principal), Doser, D. I. (Co-Principal), Argæez, M. (Supporting), Kreinovich, V. Y. (Supporting), Ceberio, M. C. (Supporting), Konter, B. R. (Supporting), Nazarian, S. (Supporting), Pownuk, A. M. (Supporting), Cabrera, S. D. (Supporting), "NSF IGERT: Mutep for Solving Multiphysics Problems," Sponsored by NSF, Federal.

Velazquez, L. (Principal), Argæez, M. (Co-Principal), "HPC Modeling and Simulation of Underbody Blast Parameter Estimation Problems," Sponsored by Other, Federal, \$1,250,000.00. (April 1, 2012 - March 31, 2017).

Argæez, M. (Principal), Ceberio, M. C., "HPC Modeling and Simulation of Underbody Blast Parameter Estimation Problems," Sponsored by Other, Federal, \$250,000.00. (January 1, 2013 - December 31, 2013).

Velazquez, L. (Co-Principal), Argæez, M. (Supporting), Bielak, J. (Principal), Steidl, J. (Co-Principal), Kallikovas, L. (Co-Principal), Asimaki, D. (Co-Principal), Ghattas, O. (Supporting), "NEESR-SG: High Fidelity Site Characterization by Experimentation, Field Observation, and Inversion-Based Modeling," Sponsored by NSF, Federal, \$146,000.00. (October 31, 2006 - September 30, 2012).

Velazquez, L. (Co-Principal), Argæez, M. (Supporting), Bielak, J. (Principal), Steidl, J. (Co-Principal), Kallikovas, L. (Co-Principal), Asimaki, D. (Co-Principal), Ghattas, O. (Supporting), "NEESR-SG: High Fidelity Site Characterization by Experimentation, Field Observation, and Inversion-Based Modeling," Sponsored by NSF, Federal, \$146,000.00. (October 31, 2006 - September 30, 2012).

Gates, A. (Principal), Velasco, A. (Co-Principal), Velazquez, L. (Co-Principal), Tweedie, C. (Co-Principal), Kreinovich, V. (Supporting), Argaez, M. (Supporting), Da Silva, P. P. (Co-Principal), "NSF CREST Cyber-ShARE: Center for sharing Cyber-Resouces to Advance Science and Education," Sponsored by NSF, Federal, \$4,999,964.00. (September 1, 2007 - August 31, 2012).

Gates, A. (Principal), Velasco, A. (Co-Principal), Velazquez, L. (Co-Principal), Tweedie, C. (Co-Principal), Kreinovich, V. (Supporting), Argaez, M. (Supporting), Da Silva, P. P. (Co-Principal), "NSF CREST Cyber-ShARE: Center for sharing Cyber-Resouces to Advance Science and Education," Sponsored by NSF, Federal, \$4,999,964.00. (September 1, 2007 - August 31, 2012).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$220,000.00. (January 1, 2010 - December 31, 2010).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$220,000.00. (January 1, 2010 - December 31, 2010).

Velazquez, L. (Co-Principal), Argaez, M. (Principal), "Hybrid Optimizatio Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$200,000.00. (January 1, 2009 - December 31, 2009).

Argaez, M. (Principal), Velazquez, L. (Co-Principal), "Hybrid Optimization Algorithms for Parameter Estimation Problems," Sponsored by Other, Federal, \$200,000.00. (January 1, 2009 - December 31, 2009).

Velazquez, L. (Principal), Argaez, M. (Co-Principal), "Graduate Fellowship: On the Development of Newton Interior-Point Trust-Region Method for Large-Scale Nonlinear Programs," Sponsored by Other, Federal, \$34,722.00. (September 1, 2002 - September 1, 2005).

Velazquez, L. (Principal), Argaez, M. (Co-Principal), "Graduate Fellowship: On the Development of Newton Interior-Point Trust-Region method for Large-Scale Nonlinear Programs," Sponsored by Other, Federal, \$34,722.00. (September 1, 2002 - September 1, 2005).

Velazquez, L. (Principal), Argaez, M. (Co-Principal), "On the Development of Newton Interior-Point Trust-Region Method for Large-Scale Nonlinear Programs," Sponsored by A O SMITH, Federal, \$400,000.00. (September 1, 2001 - December 31, 2004).

Velazquez, L. (Principal), Argaez, M. (Co-Principal), "On the Development of Newton Interior-Point Trust-Region Method for Large-Scale Nonlinear Programs," Sponsored by ARMY, Federal, \$400,000.00. (September 1, 2001 - December 31, 2004).

## **Awards and Honors**

Principal Investigator U.S Army Research Laboratory, UTEP-Provost. (April 2012).

ORSP Outstanding Performance Award in Securing Extramural Funding, ORSP-UTEP. (May 2007).

## **Intellectual Contributions in Submission**

### **Refereed Journal Articles**

Sosa, A., Velasco, A. A., Velazquez, L., Argaez, M., Romero, R. A. Joint Inversion of Optimized Constrained Geophysical Data Sets. *Journal of Geophysics International*.

Argaez, M., Mendez, O., Velazquez, L. The Notion of the Quasicentral Path in Linear Programming.

### **Journal Articles**

Sosa, A., Velazquez, L., Argaez, M., Romero, R. A. Joint Inversion of Optimized Constrained Geophysical Data Sets. *Geophysical Journal*.

Quintero, C., Ramirez, C., Sanchez, R., Argaez, M. A Path Following Method for Large-Scale and Dense  $l_1$  Underdetermined Problems. *Mathematical Optimization Computation Journal*.

Argaez, M., Mendez, O., Velazquez, L. The Notion of the Quasi-Central Path in Linear Programming. *SIAM J. of Optimization*.

### **Other**

Ramirez, C., Argaez, M.. Signal, Image and Video Processing.

Sosa, A., Velazquez, L., Velasco, A. A., Argaez, M., Romero, R. A.. Geophysical Journal International.

Sosa, A., Velazquez, L., Velasco, A. A., Argaez, M., Romero, R. A.. Geophysical Journal International.

### **Research in Progress**

"3D Survey Design Modeling Evaluation for REPSOL" (Writing Results)

"Constrained Optimization Schemes for Inverse Wave Propagation Problems" (Writing Results)

"Digital Image Processing Based on Sparse Representation" (On-Going)

"Joint Inversion Schemes for Multiple Datasets" (Writing Results)

"Projected Conjugate Gradient Algorithm for Solving KKT Systems" (On-Going)

"Reduced Order Modeling for Underbody Blast Vehicles" (On-Going)

"Reduced-Order Model Parameter Estimation" (On-Going)

"Seismic Classification Evaluation for Repsol" (On-Going)

"Sparse Representation for Classification and Dimensionality Reduction" (On-Going)

"THEORY AND METHODS FOR: SUPERRESOLUTION, OPTIMAL RECOVERY, AND COMPRESSIVE SENSING." (On-Going)

## **SERVICE**

### **Department Service**

Committee Member, Math Undergraduate Curriculum. (September 2007 - May 2012).

Committee Member, Math Library Liason. (September 2006 - August 2009).

Committee Member, Math Faculty Search. (September 1, 2008 - May 31, 2009).

### **College Service**

Committee Member, Senate Student Publications. (September 2012 - September 2015).

Committee Chair, Computational Science Committee. (September 2007 - September 2014).

Committee Member, CPS Faculty Search Committee. (September 2008 - May 2014).

Faculty Coach, Athletic Program. (October 2010 - May 2012).

Faculty Advisor, Computational Science Program. (September 2008 - May 2012).

Faculty Recruiter, Computational Science Program. (September 2008 - May 2012).

Committee Member, Computational Science Admission Committee. (September 2008 - September 2011).

### **University Service**

Committee Member, NSF CyberShare Center Committee. (July 2010 - Present).

Attendee, Graduation, Spring 2009. (May 2009 - Present).

### **Professional Service**

Chairperson, MAA Southwest Regional Conference, El Paso, TX. (April 1, 2005 - Present).

Attendee, Meeting, Workshop: Computational Sciences and Engineering, Mathematics, and Computer Sciences,, Arlington, VA. (March 2003 - Present).

Attendee, Meeting, INFORMS Annual Meeting Minority Issues Forum, San Jose, CA. (November 2002 - Present).

Session Chair, Society of Industrial and Applied Mathematis Annual Meeting, Atlanta, GA. (June 1999 - Present).

Committee Member, Army-High Performance Computing Research Center, Palo alto, CA. (June 2006 - April 2017).

Session Chair, International Conference on Applied Mathematics and Informatics, San Andres. (November 2010 - December 2010).

Program Organizer, International Conference on Applied Mathematics and Informatics, San Andres. (July 2010 - December 2010).

Referee, 2009 Richard Tapia Celebration of Diversity in Computing Conference, Portland, Oregon. (September 2008 - April 2009).

Math Representative, Initiation of El Paso Del Norte SACNAS Chapter, El Paso, TX. (November 2005 - May 2006).

Session Chair, 2005 INFORMS Annual Meeting, New Orleans, LA. (October 2005).

Session Chair, 2005 SIAM on Optimization Meeting, Stockholm. (May 2005).

Poster Judge, New Mexico AGEP Annual Meeting, Las Cruces, NM. (September 2004 - October 2004).

Research Advisor, Rice University AGEP summer program, Houston, TX. (June 2003 - August 2003).

Attendee, Meeting, A Science-Based Case for Large-Scale Simulation Workshop, Arlington, VA. (July 2003).

Attendee, Meeting, SIAM Annual Meeting Diversity Day, Montreal. (July 2003).