

TRILCE ESTRADA

Current position: Assistant Professor
Affiliation: University of New Mexico
Address: 1 University of New Mexico
Albuquerque, NM, 87131
Phone: 302 690 3846
Email address: estrada@cs.unm.edu
Web page: <http://www.cs.unm.edu/~estrada/>

EDUCATION

PhD in Computer Science, University of Delaware, Newark, Delaware. May 2012

Thesis: *On the Effectiveness of Application-Aware Self-Management for Scientific Discovery in Volunteer Computing Systems*

Advisor: Dr. Michela Taufer

MS. in Computer Science, Instituto Nacional de Astrofísica Óptica y Electrónica (INAOE), Puebla, México. October 2004

Thesis: *Automatic Identification of Stellar Populations in Galactic Spectra*

Advisor: Dr. Olac Fuentes

BS. in Computer Systems, Universidad de Guadalajara, Jalisco, México. August 2001

RESEARCH INTERESTS

High performance computing, computational biology, interdisciplinary computational science, health informatics, distributed systems, cloud computing, and machine learning.

RESEARCH EXPERIENCE

Postdoctoral Researcher at the University of Delaware. Project 1: Multi-topology distributed emulator. Worked on developing a multi-topology distributed emulator for grid, cloud, P2P and VC environments and study the platforms suitability for different scheduling policies using DAGs. Project 2: ExSciTech: An Interactive, Easy- to-Use Volunteer Computing System to Explore Science, Technology, and Health. Developed efficient techniques for analysis of massive biochemical datasets under uncertainty. (Jun 2012 – May 2013)

Research Assistant at the University of Delaware. Project: Dynamically Adaptive Protein-Ligand Docking Systems. My work in this project includes the analysis of large datasets under uncertain conditions as well as developing an autonomic resource manager for volunteer computing environments. University of Delaware, Newark, Delaware. (Sep 2007-Present)

Summer Intern at IBM T.J. Watson Research Center. Project: Galapagos. The scope of this internship included performance discovery of multi-tier business applications using non-intrusive methods. Hawthorne, New York. (May 2010 – Sep 2010)

Research Assistant at the University of Texas at El Paso. Project: Dynamically Adaptive Protein-Ligand Docking Systems. My research included designing intelligent scheduling policies and performance techniques for large, heterogeneous, and volatile distributed systems. University of Texas at El Paso, El Paso, Texas. (Jan 2006 – Aug 2007)

Summer Intern at CICESE. (Center of Scientific Research and Superior Education from Ensenada). The goal of the program is to expose undergraduate students to research. Only students with the highest GPA per major are eligible for the two-month scholarship from the Mexican Academy of Science (AMC), BCN, Mexico. (Jun 2001- Aug 2001)

PROFESSIONAL EXPERIENCE

Software Developer at the Vision Lab of INAOE. Project: Optoelectronic System Garfio 2, and YAOIMATI simulator. INAOE, Puebla, Mexico. (January 2005 – December 2005)

Software Developer at the General hospital of Guadalajara. Project: SIAU, database software for human resource control. Guadalajara, Mexico. (October 2001 – May 2002)

HONORS AND FELLOWSHIPS

- **Fank A. Pehrson Graduate Student Achievement Award** in Computer and Information Sciences. Monetary award given annually to one CIS graduate student in recognition of outstanding performance and future potential in the field. Newark, Delaware, May 2012.
- **University of Delaware Graduate Fellow Award.** Fellowship given based on academic merits covering tuition and stipend. Newark, Delaware. September 2010- May 2011.
- **Lauri Pfeffer Shinn Memorial Award.** Monetary annual award given to a female CIS student at the University of Delaware for academic achievements. Newark, Delaware. May 2009.
- **CONACyT Fellowship** (competitive four year fellowship from the Mexican Government) for graduate studies in USA, September 2006 – August 2010.
- **CONACyT Fellowship** (competitive two year fellowship from the Mexican Government) for graduate studies in Mexico, September 2002 – August 2004.
- **Outstanding Student of the Superior Education System of the Universidad de Guadalajara.** Major in computer systems. Class of 2001, Jalisco, Mexico, 2001. (Given to the Top-3 students of the class)
- **Outstanding Student of the Higher Education System of the Universidad de Guadalajara.** Class of 1997, Jalisco, Mexico, 1997. (This award is given to the Top-3 students of the class)

INVITED TALKS

- Reengineering high-throughput molecular datasets for scalable clustering using MapReduce. Imperial College of London, London, UK, June 2012.

PUBLICATIONS

Book chapters

- [B01] T. **Estrada**, M. Taufer. Challenges in Designing Scheduling Policies in Volunteer Computing. Chap. in C. Cerin and G. Fedak, Desktop Grid Computing. CRC Press. 2012.

Journal papers

- [J01] T. **Estrada**, B. Zhang, P. Cicotti, R. Armen, and M. Taufer: Accurate Analysis of Large Datasets of Protein-ligand Binding Geometries using a Linear Clustering Method based on MapReduce. *Computers in Biology and Medicine*, 2012.
- [J02] K. Benson, S. Schlachter, T. **Estrada**, M. Taufer, E. Cochran, and J. Lawrence: On the Powerful Use of Simulations in the Quake-Catcher Network to Efficiently Position Low-cost Earthquake Sensors. *Future Generation Computer Systems*, 2012. (in review)
- [J03] O. Rahaman, T. **Estrada**, D. Doren, M. Taufer, C. L. Brooks III, R.S. Armen: Evaluation of Several Two-Step Scoring Functions Based on Linear Interaction Energy, Effective Ligand Size, and Empirical Pair Potentials for Prediction of Protein-Ligand Binding Geometry and Free Energy. *Journal of Chemical Information and Modeling*, Volume: 51, Issue 9, Pages: 2047 – 65, 2011.
- [J04] T. **Estrada**, M. Taufer, and D.P. Anderson: Performance Prediction and Analysis of BOINC Projects: An Empirical Study with EmBOINC. *Journal of Grid Computing*, Volume: 7, Pages: 537–554, 2009.
- [J05] T. **Estrada**, O. Fuentes, and M. Taufer: A Distributed Evolutionary Method to Design Scheduling Policies for Volunteer Computing. *ACM SIGMETRICS Performance Evaluation Review Journal*, Volume: 36, Issue: 3, Pages: 40 – 49, 2008.

Peer-reviewed Papers in Conferences

- [C01] T. **Estrada** and Michela Taufer, On the effectiveness of application-aware self-management for scientific discovery in volunteer computing systems. Accepted for publication on the *International Conference for High Performance Computing, Networking, Storage and Analysis (SC-2012)*. November 2012, Salt Lake City. (Acceptance Rate: 21%)
- [C02] T. **Estrada**, B. Zhang, P. Cicotti, R. Armen, M. Taufer. Reengineering high-throughput molecular datasets for scalable clustering using MapReduce. In *Proc. of the 14th IEEE International Conference on High Performance Computing and Communications (HPCC-2012)*. June 2012, Liverpool, UK.
- [C03] K. Benson, T. **Estrada**, M. Taufer, E. Cochran, and J. Lawrence: On the Powerful Use of Simulations in the Quake-Catcher Network to Efficiently Position Low-cost Earthquake Sensors. In *Proc. of the 7th IEEE International Conference on e-Science and Grid Technologies (eScience)*, December 2011, Stockholm, Sweden. (Acceptance Rate: 54/110, 50%)
- [C04] T. **Estrada** and M. Taufer: Providing Application-Level Quality of Science in Volunteer Computing. In *Proc. of the 13th IEEE High Performance Computing and Communications*

- Conference (HPCC)*, September 2011, Banff, Canada. (Acceptance Rate: 59/271, 21.7%)
- [C05] **T. Estrada**, R. Armen, and M. Taufer: Automatic Selection of Near-Native Protein-Ligand Conformations using a Hierarchical Clustering and Volunteer Computing. In *Proc. of the 2nd ACM International Conference on Bioinformatics and Computational Biology (ACM-BCB)*, August 2010, Buffalo, USA. (Acceptance Rate: 37/136, 28%)
- [C06] **T. Estrada**, K. Reed, and M. Taufer: Modeling Job Lifespan Delays in Volunteer Computing Projects. In *Proc. of to the 9th IEEE International Symposium on Cluster Computing and Grid (CCGrid)*, May 2009, Shanghai, China. (Acceptance Rate: 57/271, 21%)
- [C07] J. Atlas, **T. Estrada**, K. Decker, and M. Taufer: Balancing Scientist Needs and Volunteer Preferences in Volunteer Computing using Constraint Optimization. In *Proc. of the International Conference on Computational Science (ICCS)*, May 2009, Baton Rouge, Louisiana, USA. (Acceptance Rate: ~30%)
- [C08] **T. Estrada**, O. Fuentes, and M. Taufer: A Distributed Evolutionary Method to Design Scheduling Policies for Volunteer Computing. In *Proc. of the 5th ACM International Conference on Computing Frontiers*, May 2008, Ischia, Italy. (Acceptance Rate: 30/110, 27%)
- [C09] **T. Estrada**, D.A. Flores, M. Taufer, P.J. Teller, A. Kerstens, and D. Anderson: The Effectiveness of Threshold-based Scheduling Policies in BOINC Projects. In *Proc. of the 2nd IEEE International Conference on e-Science and Grid Technologies (eScience)*, December 2006, Amsterdam, The Netherlands. (Acceptance Rate: 60/160, 37.5%)
- [C10] **T. Estrada**, A. Licon, and M. Taufer: CompPknots: a Framework for Parallel Prediction and Comparison of RNA Secondary Structures with Pseudoknots. In *Proc. of the 1st Workshop on High Performance Computing in Genomic, Proteomic and Transcriptomic (ISPA)*. December 2006, Sorrento, Italy.
- [C11] **T. Estrada** and O. Fuentes: Identification of Stellar Population in Galactic Spectra using the Hierarchical Decision Ensemble. In *Proc. of the 18th International Florida Artificial Intelligence Research Society Conference*, May 2005, Tampa Bay, Florida, USA.
- [C12] E. Terlevich, R. Terlevich, J. P. Torres-Papaqui, **T. Estrada**, O. Fuentes, T. Solorio, and S. Bressan: Computer Science Approach to the Stellar Fabric of Violent Starforming Regions in AGN. The Interplay among Black Holes, Stars and ISM in Galactic Nuclei. In *Proc. of the International Astronomical Union Symposium*, 2004. Cambridge, UK.
- [C13] **T. Estrada**, J. P. Torres-Papaqui, R. Terlevich, O. Fuentes, E. Terlevich: Age determination of the Nuclear Stellar Population of Active Galactic Nuclei using Locally Weighted Regression. In *Proc. of the 13th Astronomical Data Analysis Software and Systems Conference*, September 2003, Strasbourg, France.

Peer-reviewed Papers in Workshops

- [W01] M. Matheny, S. Schlachter, L. Crouse, E. Kimmel, **T. Estrada**, M. Schumann, R. Armen, G. Zoppetti, and M. Taufer: ExSciTech: Expanding Volunteer Computing to Explore

Science, Technology, and Health. *In Proc. of the 2nd workshop on Analyzing and Improving Collaborative eScience with Social Networks (eSoN 12)*, October 2012, Chicago, Illinois, USA.

- [W02] **T. Estrada**, K. Reed, D. Anderson, and M. Taufer: EmBOINC: An Emulator for Performance Analysis of BOINC Projects. *In Proc. of the 3rd Workshop on Large-Scale, Volatile Desktop Grids (PCGrid)* in conjunction with IPDPS'09, May 2009, Rome, Italy.
- [W03] M. Taufer, A. Kerstens, **T. Estrada**, D.A. Flores, and P.J. Teller: SimBA: a Discrete Event Simulator for Performance Prediction of Volunteer Computing Projects. *In Proc. of the 21st International Workshop on Principles of Advanced and Distributed Simulation (PADS)*, June 2007, San Diego, California, USA. (Acceptance Rate: 37/24, 65%)
- [W04] M. Taufer, A. Kerstens, **T. Estrada**, D.A. Flores, R. Zamudio, P.J. Teller, R. Armen, and C.L. Brooks III: Moving Volunteer Computing towards Knowledge-Constructed, Dynamically-Adaptive Modeling and Scheduling. *In Proc. of the 1st Workshop on Large-Scale, Volatile Desktop Grids (PCGrid)*, in conjunction with IPDPS'07, March 2007, Long Beach, California, USA
- [W05] **T. Estrada** and O. Fuentes: Identification of Stellar Population in Galactic Spectra using the Hierarchical Decision Ensemble. *In Proc. of the 1st Iberoamerican Workshop for Scientific Applications*, November 2004, Puebla, Mexico.

Peer-reviewed Posters

- [P01] **T. Estrada** and M. Taufer: Docking@Home: Searching for New Drugs using Volunteer's Computers. *In Proc. of the Grace Hopper Conference*, October 2009, Tucson, Arizona, USA.
- [P02] **T. Estrada**, M. Taufer, and K. Reed: Performance analysis of Volunteer Computing Traces. *In Proc. of the ACM/IEEE Supercomputing 07*, November 2007. Reno, Nevada, USA. (Acceptance Rate: 24.5%)
- [P03] D. A. Flores, **T. Estrada**, M. Taufer, P. Teller, and A. Kerstens: SimBA: a Discrete Event Simulator for Performance Prediction of Volunteer Computing Projects. *In Proc. of the ACM/IEEE Supercomputing 06*, November 2006, Tampa, Florida, USA. (Acceptance Rate: 25%)

TEACHING AND MENTORING EXPERIENCE

- **CISC662** Graduate Computer Architecture. Guest lecturer, October 4,9 of 2012
- **CISC372** Parallel Programming. Guest lecturer, May 14, 2012
- **CISC662** Graduate Computer Architecture. Guest lecturer, November 14,16,18 of 2011
- **CISC662** Graduate Computer Architecture. Guest lecturer, April 20, 22 of 2011

Under supervision and collaboration with Dr. Michela Taufer, served as graduate research mentor for undergraduate and graduate students. Worked closely with students to guide them through the research process, designing a solution, and publishing the research.

- **Michael Matheny**, Undergraduate student and REU student at UDEL, "*ExSciTech: an interactive system to Explore Science, Technology, and Health*", 2012

- **Boyu Zhang**, PhD student at UDEL, “*Reengineering high-throughput molecular datasets for scalable clustering using MapReduce*”, 2011
- **Kyle Benson**, Undergraduate student at UDEL, “*On the Powerful Use of Simulations in the Quake-Catcher Network to Efficiently Position Low-cost Earthquake Sensors*”, 2010
- **Brenda Medina**, CRA-W undergraduate visiting student, “*Analyzing large datasets of protein-ligand docking conformations*”, 2008
- **David Flores**, Master student at UTEP, “*SimBA: a Discrete Event Simulator for Performance Prediction of Volunteer Computing Projects*”, 2006

FUNDS AND AWARDS

- **Senior personnel in NSF CNS#1217812**, \$500,000, Michela Taufer (PI, University of Delaware), Arnold L. Rosenberg (PI, Northeastern University) and Rajmohan Rajaraman (Northeastern University), 2012
Title: CSR: Small: Collaborative: Pursuing High Performance on Clouds and Other Dynamically Heterogeneous Computing Platforms
Description: Developing a transformative computing paradigm that enables high-performance computing on computing clouds and many types of computing grids.
My role: collaborated with ideas and writing on the multi-platform emulator
- **Project leader of a NCWIT Award**, \$750 awarded to CISTers@UD
Title: CIS outside the box, video contest, 2012
Description: Organized two (40+ people) workshops and pilot contest to attract female students to CIS.
My role: wrote proposal, coordinated workshops, prepared and presented tutorials on video shooting and editing. All activities were in collaboration with Boyu Zhang, Priscilla Moraes, and Terrence Harvey (UD).
- **Professional development award**, University of Delaware. \$1000 travel award to attend the ACM International Conference on Bioinformatics and Computational Biology, Buffalo, New York. May 2010.
- **NSF travel award** to attend the 2010 Academic Workshops for Under-represented Junior Faculty and Senior Graduate Students, Houston, Texas. March 2010.
- 2nd place at the SC09 Student Scientific Programming Competition (by teams). Portland, Oregon. November 2009.
- **Grace Hopper scholarship**, travel award to attend the Grace Hopper Celebration of Women in Computing, Tucson, Arizona. October 2009.
- **Professional development award**, University of Delaware. \$1000 travel award to attend the IEEE International Symposium in Cluster Computing and the Grid, Shanghai, China. May 2009.
- **Usenix travel award** to attend the Workshop on Supporting Diversity in Systems Research, held in conjunction with OSDI, San Diego, California. December 2008.
- **Alumni enrichment award**, University of Delaware. \$2000 travel award to attend the ACM International Conference on Computing Frontiers, Ischia Italy. May 2008.

SERVICE

Service in program committees:

- Industry & Experience track of ACM/SPEC International Conference on Performance Engineering (ICPE) 2013
- International Symposium on Cluster, Cloud, and Grid Computing (CCGrid) 2013
- International Conf. on High Performance Computing and Communications (HPCC) 2012
- Poster track of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC) 2012, 2013

Service as a reviewer in journals and conferences:

- Journal of Parallel and Distributed Computing (JPDC) 2011, 2012
- ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC) 2012
- IEEE/ACM Intl. Symposium on Cluster, Cloud and Grid Computing (CCGrid) 2010, 2012
- IEEE Cluster Conference (Cluster) 2011
- IEEE International Parallel & Distributed Processing Symposium (IPDPS) 2011
- ACM International Conference on Computing Frontiers (CF) 2010
- IEEE International Conference on Computer Design (ICCD) 2010

Service in conferences:

- Student Volunteer, CRA-W/CDC Systems Mentoring Workshop. (2008)
- Student Volunteer for the Supercomputing conferences. (2007, 2008, 2009)

Outreach service in the University and CIS Department:

- CIS representative and co-Webmaster for the steering committee of Women in Engineering (WiE) at the University of Delaware. (2010 – 2012)
- CIS-Graduate Student Association officer at the University of Delaware. (2009 – 2010)
- CISTers coordinator and Webmaster. CISTers is a group of women in technology-related fields at the University of Delaware. <http://www.eecis.udel.edu/~cisters> (2008- 2012)

PROFESSIONAL AFFILIATIONS

- IEEE – Institute of Electrical and Electronics Engineers. (2009 - Present)
- LiC – Latinas in Computing. (2009 – Present)
- ACM - Association for Computing Machinery. (2008 - Present)

LANGUAGES

Spanish (native), English (fluent)