Alfredo Giménez | C.V.

1211 Pine St. Oakland, CA 94607
+1 916 622-7078 • alfredo.gimenez@gmail.com
https://github.com/alfredo-gimenez

Ph.D. candidate in Computer Science at the University of California, Davis and academic collaborator at the Lawrence Livermore National Laboratory. Expertise in High-Performance Computing (HPC) and large-scale data analysis and visualization. Interested in using data science for understanding and predicting the complex behaviors in data motion, energy consumption, faults, and temperature in HPC environments.

Education

- **University of California, Davis** — **Davis, CA**
  Doctor of Philosophy (in progress), Computer Science — *September 2011–current*
  Institute of Data Analysis and Visualization. Advisor: Bernd Hamann
- **University of California, Davis** — **Davis, CA**
  Bachelor of Science, Computer Science — *September 2006–November 2010*

Experience

Research

- **Lawrence Livermore National Laboratory** — **Livermore, CA**
  Research Intern — *April 2016–Current*
  Research/Development for automatic data processing of large disparate data sources for the purpose of creating machine learning models to predict HPC performance behavior.
- **Lawrence Livermore National Laboratory** — **Livermore, CA**
  Research Intern — *June 2015–September 2015*
  Research/Development for large-scale data storage, parallel processing, and analysis of HPC performance data. Developed advanced methods for correlating memory data to application meshes and using memory access samples to predict performance bugs (in collaboration with several other student interns).
- **Lawrence Livermore National Laboratory** — **Livermore, CA**
  Research Intern — *June 2014–September 2014*
  Research/Development for finding patterns and correlations in memory access data within MemAxes. Created Mitos, a data collection and program annotation tool.
- **Lawrence Livermore National Laboratory** — **Livermore, CA**
  Research Intern — *June 2013–September 2013*
  Research/Development of data collection tools for memory access information. Created MemAxes, a visualization/analysis tool for memory accesses on complex hardware topologies.

Industry

- **Stratovan Corporation** — **Davis, CA**
  Performance Consultation — *January 2015–June 2015*
  Research/Development for optimizing the performance of Stratovan's segmentation and detection algorithms. Helped them achieve a 4x throughput improvement.
- **Intel Corporation** — **Folsom, CA**
  Software Research and Development — *June 2010–October 2012*
  Research/Development to showcase the capabilities of heterogeneous computing on Intel integrated GPU and CPU hardware using OpenCL. Created a debugging and analysis tool for OpenCL programs that eventually became the OpenCL Code Builder that is currently shipped with Intel's OpenCL SDK. Co-authored a patent for the hardware-agnostic OpenCL line-by-line debugging capability in Code Builder.

Projects

Led by me

- **MemAxes** Visualization and analysis of memory accesses on complex hardware topologies.
- **Mitos** Memory access sampling and data structure instrumentation interface.

Led by colleagues

- **spack** Package manager for HPC environments used in LLNL and other labs.
- **Caliper** Generic context annotation tool for performance data collection in HPC.

Technical Skills

- **Programming Languages:** C, C++, Python, Java, Scala, JavaScript
- **Parallel Programming Models:** Spark, MapReduce, OpenMP, MPI, OpenCL, pthreads
- **Data Analysis:** pandas, numpy, scipy, scikit-learn, MLlib
- **Visualization/Graphics:** OpenGL, WebGL, DirectX, VTK, D3.js, VisIt, ParaView, Qt, matplotlib, gnuplot
- **Database Infrastructure:** Cassandra, HBase, Hadoop (HDFS), SQL
- **Developer Tools:** git, svn, Perforce, cmake, gdb, Visual Studio

Papers

[1] Benafsh Husain, Alfredo Giménez, Joshua A. Levine, Todd Gamblin, and Peer-Timo Bremer. "Relating memory performance data to application domain data using an integration API". In: *Proceedings of the 2nd Workshop on Visual Performance Analysis, VPA 2015, Austin, Texas, USA, November 15, 2015*. 2015, 5:1–5:8. DOI: 10.1145/2835238.2835243. URL: http://doi.acm.org/10.1145/2835238.2835243.

[2] Garrett Aldrich, Alfredo Giménez, Michael Oskin, Richard Strelitz, Jonathan Woodring, Louise H. Kellogg, and Bernd Hamann. "Curvature-Based Crease Surfaces for Wave Visualization". In: *VMV 2014: Vision, Modeling & Visualization, Darmstadt, Germany, 2014. Proceedings*. 2014, pp. 39–46. DOI: 10.2312/vmv.20141274. URL: http://dx.doi.org/10.2312/vmv.20141274.

[3] Alfredo Giménez, Todd Gamblin, Barry Rountree, Abhinav Bhatele, Ilir Jusufi, Peer-Timo Bremer, and Bernd Hamann. "Dissecting On-node Memory Access Performance: A Semantic Approach". In: *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*. SC '14. New Orleans, Louisana: IEEE Press, 2014, pp. 166–176. ISBN: 978-1-4799-5500-8. DOI: 10.1109/SC.2014.19. URL: http://dx.doi.org/10.1109/SC.2014.19.

[4] Katherine E. Isaacs, Alfredo Giménez, Ilir Jusufi, Todd Gamblin, Abhinav Bhatele, Martin Schulz, Bernd Hamann, and Peer-Timo Bremer. "State of the Art of Performance Visualization". In: *EuroVis - STARs*. Ed. by R. Borgo, R. Maciejewski, and I. Viola. The Eurographics Association, 2014. ISBN: -. DOI: 10.2312/eurovisstar.20141177.

[5] René Rosenbaum, Alfredo Giménez, Heidrun Schumann, and Bernd Hamann. "A flexible low-complexity device adaptation approach for data presentation". In: vol. 7868. 2011, DOI: 10.1117/12.871975. URL: http://dx.doi.org/10.1117/12.871975.

[6] Alfredo Giménez, René Rosenbaum, Mario Hlawitschka, and Bernd Hamann. "Using R-Trees for Interactive Visualization of Large Multidimensional Datasets". In: *Advances in Visual Computing - 6th International Symposium, ISVC 2010, Las Vegas, NV, USA, November 29 - December 1, 2010, Proceedings, Part II*. 2010, pp. 554–563. DOI: 10.1007/978-3-642-17274-8_54. URL: http://dx.doi.org/10.1007/978-3-642-17274-8_54.

Posters

[1] Alfredo Giménez, Todd Gamblin, Peer-Timo Bremer, Abhinav Bhatele, and Martin Schulz. "Combining Disparate Data Sources in the HPC Ecosystem". In: *Salishan Conference on High-Speed Computing 2016*. Gleneden Beach, OR, USA, 2016.

[2] Alfredo Giménez, Benafsh Husain, David Boehme, Todd Gamblin, and Martin Schulz. "Mitos: A Simple Interface for Complex Hardware Sampling and Attribution". In: *Supercomputing 2015*. Austin, TX, USA, 2015.

Presentations

[1] Alfredo Giménez. "Visualizing data by displaying it in the domain of scientific data". In: *VAPLS 2013 Workshop on Visualization and Analysis of Performance on Large-scale Software*. Atlanta, GA, USA, 2013.

[2] Alfredo Giménez. "Visualizing Memory Performance Data in the Application Domain". In: *Paradyn/HTCondor Week 2013*. Madison, WI, USA, 2013.