

Felipe Gutierrez Barragan

Research Interests

Computer vision, machine and statistical learning, scientific computing, physics-based modeling and simulation.

Education

- 2016–present **University of Wisconsin-Madison, Ph.D. Student, Computer Sciences.**
◦ *Advisor: Mohit Gupta.*
- 2012–2016 **University of Wisconsin-Madison, B.S. in AMEP and Computer Sciences.**
◦ *Applied Math, Eng., & Physics. Advisor: Dan Negrut.* Senior Project: "Modeling and simulation of fluid-solid interaction problems on distributed memory architectures using the Charm++ parallel programming paradigm"
◦ *Computer Sciences. Advisor: Vikas Singh.* Thesis: "Accelerating Permutation Testing in Neuroimaging through Subspace Tracking"
- 2015, 2016 **Summer Schools.**
Argonne Training Program in Extreme-Scale Computing (2016), Blue Waters Internship Workshop (2015).

Selected Positions

Academic/Research

- 2016–present **UW-Madison, Research Assistant, Computer Vision Group, Madison, WI.**
◦ Investigate optimal modulation and demodulation waveforms for Correlation-based Time of Flight Imaging.
- 2016–present **UW-Madison, Project Assistant, PEOPLE Program, Madison, WI.**
◦ Math, Science, and World Languages Academic Lead at James Madison Memorial High School.
- 2015–2016 **UW-Madison, Research Assistant, Wisconsin ADRC Imaging Group, Madison, WI.**
◦ Developed RapidPT, an open-source MATLAB toolbox that accelerates permutation testing in neuroimaging by leveraging low-rank matrix completion.
- 2013–2016 **UW-Madison, Research Assistant, Simulation-Based Engineering Lab, Madison, WI.**
◦ Investigated and implemented parallel programming techniques and technologies to develop a distributed memory fluid-solid interaction engine.
◦ Developed the full-stack of a web app that records and displays the performance and testing metrics of *Chrono*.
◦ Developed web-based and scripting tools for pre/post processing tasks such as: model setup and rendering.

Industry

- Summer 2016 **Cray Inc, Intern, Performance Team, St Paul, MN.**
◦ Contributed to the shared, distributed, and hybrid implementations of a bioinformatics application, and evaluated their performance on various many-core architectures.
- Summer 2014 **Microsoft Corporation, Intern, Maps App Team, Seattle, WA.**
◦ Developed the desktop, phone and tablet UX that allows Maps app users to interact with the available layers.

Publications

Preprints & Working Papers

- In Preparation **F. Gutierrez-Barragan, V. Ithapu, C. Hinrichs, T.E. Nichols, S.C. Johnson, V. Singh.** Accelerating Permutation Testing in Neuroimaging through Subspace Tracking. *In Preparation.*

Conference & Journal Articles

- IDETC/CIE 2014 D. Kaczmarek, A. Bartholomew, **F. Gutierrez**, H. Mazhar, D. Negrut. Chrono::Render: A graphical visualization pipeline for multibody dynamics simulations. *ASME IDETC/CIE*, 2014.

Conference Abstracts, Presentations, & Posters

- IDETC/CIE 2016 **F. Gutierrez**, A. Pazouki, D. Negrut. Distributed Memory Fluid-Solid Interaction Simulations via Chrono::HPC. Presented at *ASME IDETC/CIE*, 2016. Technical Report under preparation.
- Poster Presentation Leveraging Charm++ for meshless fluid simulations on distributed memory architectures. Presented at *Blue Waters Symposium 2016* and *Machine-Ground Interaction Consortium 2015*.

Selected Achievements/Awards

- 2016 Meritorious Winner in the 2016 Mathematical Contest in Modeling (MCM)
- 2016 AMEP Leadership Prize - UW-Madison Math Department
- 2016 Blue Waters Symposium Travel Grant
- 2015 Blue Waters Student Internship Program - National Center for Supercomputing Applications

Computer Skills

- 10,000+ lines C, C++, Python, Matlab.
- 1,000+ lines Java, Javascript, C#.
- Parallel Tools CUDA, Charm++, MPI, OpenMP, ArrayFire.
- Tools Unix-based systems, CMake, Makefiles, Git, L^AT_EX, Mex, Armadillo, PostgreSQL, SQLAlchemy.
- Web and App HTML/CSS, WebGL, Three.js, Flask, Windows App Dev.

Relevant Coursework

- Comp. Sci. Computer Vision, Big Data Systems, Artificial Intelligence, Computational Cognitive Sciences, Tools & Environment for Optimization, Algorithms, Databases, Operating Systems, Data Structures.
- Math/Physics Theory of Probability, Stochastic Processes, Linear Optimization, Electronic Aids in Measurement.

Outreach and Leadership

- ProCSI Co-coordinator of Promoting the Computational Science Initiative outreach program in 2013 and 2015. Directed CAD and intro to programming modules.
- Alfabetizacion Volunteer tutor once a week for groups of 2-4 elementary and middle school children in math and english (2010-2011).
- Waterski UW-Madison Waterski team captain, trick coach and competing member.

Languages

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|---------|--------------------------|---|
| Spanish | Fluent | <i>Native Language</i> |
| English | Fluent | <i>12 years of study. Lived and studied in the US for 4+ years.</i> |
| French | Intermediate (B1+ level) | <i>2 years of study. Studied 6 months in France.</i> |

References

Professor Mohit Gupta
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Professor Vikas Singh
Associate Professor
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Professor Dan Negrut
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