

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*.
- Implemented web-based and scripting apps for pre/post processing tasks such as: model setup and rendering.

Industry

Summer 2016 **Cray Inc, Intern, SW Performance Team, St Paul, MN.**

- Implemented and evaluated the performance of shared, distributed, and hybrid implementations of a bioinformatics application in different high performance computing 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 **Felipe Gutierrez-Barragan, Vamsi Ithapu, Sterling C. Johnson, Vikas Singh.** Accelerating Permutation Testing in Neuroimaging through Subspace Tracking. *In Preparation*.

Conference & Journal Articles

IDETC/CIE 2014 Daniel Kaczmarek, Aaron Bartholomew, **Felipe Gutierrez**, Hammad Mazhar, Dan Negrut. Chrono::Render: A graphical visualization pipeline for multibody dynamics simulations. *ASME IDETC/CIE*, 2014.

Conference Abstracts, Presentations, & Posters

- IDETC/CIE 2016 **Felipe Gutierrez**, Arman Pazouki, Dan 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, \LaTeX , 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

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Professor Vikas Singh
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