

# Felipe Gutierrez Barragan

## Research Interests

Computational imaging, computer vision, machine 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.**

2017 Wisconsin Entrepreneurship Bootcamp (2017), 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.

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.

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.

### Teaching

2017 **UW-Madison, Teaching Assistant, Madison, WI.**

- CS766 - Computer Vision (Spring 2017), CS368 - Matlab Programming (Summer 2017)

Fall 2016 **UW-Madison, Project Assistant, PEOPLE Program, Madison, WI.**

- Math, Science, and World Languages Academic Lead at James Madison Memorial High School.

### 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

### Conference & Journal Articles

- NeuroImage 2017 **F. Gutierrez-Barragan, V. Ithapu, C. Hinrichs, C. Maumet, T.E. Nichols, S.C. Johnson, V. Singh.** Accelerating Permutation Testing in Voxel-wise Analysis through Subspace Tracking: A new plugin for SnPM. *Neuroimage*, 2017.

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<sup>A</sup>T<sub>E</sub>X , 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 Statistical Inference, Probability Theory, 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

Spanish Fluent *Native Language*

English Fluent *12 years of study. Lived and studied in the US for 4+ years.*

French Intermediate (B1+ level) *2 years of study. Studied 6 months in France.*

### References

**Professor Mohit Gupta**

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Computer Sciences  
UW-Madison  
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**Professor Vikas Singh**

Associate Professor  
Computer Sciences  
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**Professor Dan Negrut**

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sor  
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