

# Felipe Gutierrez

## Research Interests

Scientific computing, machine and statistical learning, non-parametric statistics, physics-based modeling and simulation.

## Education

2012–2016 **BS. Applied Math, Engineering & Physics**, UW-Madison, Cum. GPA: 3.4.

Advisor: Dan Negrut. Senior Project: "Modeling and simulation of fluid-solid interaction problems on distributed memory architectures using the Charm++ parallel programming paradigm"

2012–2016 **BS. Computer Science (Honors)**, UW-Madison, Major GPA: 3.6.

Advisor: Vikas Singh. Thesis: "A framework for designing fast and robust permutation testing using matrix completion: Applications to neuroimaging"

## Positions Held

### Academic/Research

2013–present **Research Assistant**, *Simulation-Based Engineering Lab*, Madison, WI.

Collaborated with Prof. Dan Negrut and Dr. Arman Pazouki in the study of parallel programming techniques and technologies for GPU, shared and distributed memory architectures, and their application to fluid-solid interaction problems. Other duties included developing web-based and scripting programs for pre and post processing tasks.

2015–present **Research Assistant**, *Wisconsin ADRC Imaging Group*, Madison, WI.

Worked with Prof. Vikas Singh and Vamsi Ithapu on improving the scalability, validating, benchmarking, extending, and open-sourcing a novel permutation testing algorithm.

### Industry

Summer 2014 **Explorer Intern**, *Microsoft Corporation*, Seattle, WA.

Performed the overall development of the UX that allows Maps app users to interact with the available layers. The UX addressed desktop, phone and tablet.

### Previous Positions

Summer 2013 **Student Help**, *Madison Plasma Dynamo Experiment*, Madison, WI.

2012–2013 **Web Developer**, *Dept. of Nutritional Sciences*, Madison, WI.

## Awards/Honors

2015 Blue Waters Student Internship Program - National Center for Supercomputing Applications

2014 Frontier Fellowship - Wisconsin Institutes for Discovery

2013 Welton Honors Summer Sophomore Apprenticeship Grant - Honors Program

## Publications

Under Review **Felipe Gutierrez**, Vamsi Ithapu, Sterling C. Johnson, Vikas Singh. An SnPM toolbox for fast permutation testing using matrix completion. *In Preparation*.

IDETC/DIE 2016 **Felipe Gutierrez**, Arman Pazouki, Dan Negrut. Modeling and simulation of fluid-solid interaction problems on distributed memory architectures with Charm++. *ASME IDETC/CIE*, 2016. Abstract Submitted.

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.

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## Presentations

- 2015 **Machine-Ground Interaction Consortium**, Madison, WI.  
Leveraging Charm++ for meshless fluid simulations on distributed memory architectures.
- 2013 **UW-Madison Undergraduate Symposium**, Madison, WI.  
Small Radio Telescope Probes Dark Matter.

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## Computer Skills

- 10,000+ lines C, C++, Matlab.
- 1,000+ lines Python, 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.

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## 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.

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## Coursework

- Graduate Computer Vision, Stochastic Processes, Computational Cognitive Sciences and Electronic Aids in Measurement.
- Comp. Sci Data Structures, Algorithms, Artificial Intelligence, Databases, Operating Systems.
- AMEP Math: 31 credits, Physics: 28 credits, Engineering: 25 credits.

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## Languages

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

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## References

Professor Vikas Singh

Associate Professor  
Department of Computer Science  
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Dr. Arman Pazouki

Scientist  
Department of Mechanical Engineering  
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Professor Dan Negrut

Vilas Associate Professor  
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