

Felipe Gutierrez Barragan

Research Interests

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

Education

- 2016–present **University of Wisconsin-Madison**, *Ph.D. Student, Computer Science.*
◦ *Advisor: Mohit Gupta.*
- 2012–2016 **University of Wisconsin-Madison**, *B.S in Applied Math and Computer Science.*
◦ *Applied Math Advisor: Dan Negrut.* Senior Project: "Modeling and simulation of fluid-solid interaction problems on distributed memory architectures using the Charm++ parallel programming paradigm"
◦ *Computer Science 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 **Research Assistant**, *Computer Vision Group*, Madison, WI.
◦ Investigate optimal modulation and demodulation waveforms for Correlation-based Time of Flight Imaging.
- 2016–present **Project Assistant**, *PEOPLE Program*, Madison, WI.
- 2015–2016 **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 **Research Assistant**, *Simulation-Based Engineering Lab*, Madison, WI.
◦ Investigate and implement 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 **SW Performance Intern**, *Cray Inc*, 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 **Explorer Intern**, *Microsoft Corporation*, 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/DIE 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, L^AT_EX, Mex, Armadillo, PostgreSQL, SQLAlchemy.
- Web and App HTML/CSS, WebGL, Three.js, Flask, Windows App Dev.

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.

Coursework

- Graduate Computer Vision, Stochastic Processes, Computational Cognitive Sciences and Electronic Aids in Measurement.
- Comp. Sci Data Structures, Algorithms, Artificial Intelligence, Databases, Operating Systems.

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 Vikas Singh

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Professor Dan Negrut

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