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Felipe Gutierrez Barragan

Research Interests

Scientific computing, machine and statistical learning, high-performance computing, physics-based modeling and simulation.

Education

2016 **Ph.D. Student, Computer Science**, *University of Wisconsin-Madison*.

2012–2016 **BS. Applied Math, Engineering & Physics**, *University of Wisconsin-Madison*.
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)**, *University of Wisconsin-Madison*.
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.
- 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*.
- Developed web-based and scripting programs for pre and post processing tasks such as: model setup and rendering.

2015–present **Research Assistant**, *Wisconsin ADRC Imaging Group*, Madison, WI.
- Developed RapidPT, an open-source MATLAB toolbox for fast and efficient permutation testing with state of the art performance. The permutation testing procedure is accelerated through low-rank matrix completion.

Industry

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

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.

Publications

In Preparation **Felipe Gutierrez**, Vamsi Ithapu, Sterling C. Johnson, Vikas Singh. Accelerating Permutation Testing in Neuroimaging through Subspace Tracking. *In Preparation.*

IDETC/DIE 2016 **Felipe Gutierrez**, Arman Pazouki, Dan Negrut. Distributed Memory Fluid-Solid Interaction Simulations via Chrono::HPC. *ASME IDETC/CIE*, 2016. Abstract Accepted.

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.

Achievements/Awards

2016 Argonne Training Program on Extreme-Scale Computing
2016 Meritorious Winner in the 2016 Mathematical Contest in Modeling (MCM)
2016 AMEP Leadership Prize - Math Department
2016 Blue Waters Symposium Travel Grant
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

Presentations

2015 **Machine-Ground Interaction Consortium**, Madison, WI.
- Leveraging Charm++ for meshless fluid simulations on distributed memory architectures.

2016, 2013 **UW-Madison Undergraduate Symposium**, Madison, WI.
- Distributed Memory Fluid-Solid Interaction Simulations (2016)
- Small Radio Telescope Probes Dark Matter (2013)

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, LaTeX , 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

Associate Professor
Department of Computer Science
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Professor Dan Negrut

Vilas Associate Professor
Department of Mechanical Engineering
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