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

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

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

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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Professor Vikas Singh
Associate Professor
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Professor Dan Negrut
Mead Witter Foundation Professor
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