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Felipe Gutierrez Barragan

Research Interests

Computational imaging, computer vision, biomedical imaging, machine learning, physics-based modeling and simulation.

Education

2016–present **University of Wisconsin-Madison, M.S. and Ph.D. Candidate in Computer Science**.
- Advisor: Mohit Gupta.
- Completed M.S. Fall 2018. Passed Qualifying Exam in Computer Vision and Machine Learning Fundamentals.

2012–2016 **University of Wisconsin-Madison, B.S. in AMEP and Computer Science**.
- Applied Math, Engineering, and Physics. Senior Project Advisor: Dan Negrut.
- Computer Sciences. Thesis Advisor: Vikas Singh.

2015, 2016, 2017 **Summer Schools**.
Morgridge Entrepreneurship Bootcamp (2017), Argonne Training Program in Extreme-Scale Computing (2016), Blue Waters Workshop (2015).

Selected Positions

Academic/Research

2016–present **UW-Madison, Research Assistant, Wisconsin Imaging and Computer Vision Lab**, *Madison, WI*.
- Designed novel coding functions for continuous-wave time-of-flight imaging robust to high noise levels.
- Developed a time-of-flight imaging system performance simulation framework.
- Built a configurable time-of-flight camera from off-the-shelf optics and electronics.

2016-2018 **UW-Madison, Teaching Assistant**, *Madison, WI*.
- Intro to HCI (Spring 2018), Intro to Signal Processing (Fall 2017), Matlab Programming (Summer 2017), Computer Vision (Spring 2017), Lead for Math/Science/World Languages in the PEOPLE program (Fall 2016).

2015–2016 **UW-Madison, Research Assistant, Wisconsin ADRC Imaging Group**, *Madison, WI*.
- Developed an open-source MATLAB toolbox that accelerates permutation testing in neuroimaging studies by leveraging matrix completion methods.

2013–2016 **UW-Madison, Research Assistant, Simulation-Based Engineering Lab**, *Madison, WI*.
- Investigated and implemented parallel programming techniques for distributed fluid-solid interaction simulations.
- 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

Spring 2019 **Light, Research Intern, Computational Imaging Team** , *San Francisco, CA*.

Summer 2016 **Cray Inc, Intern, Performance Team**, *St Paul, MN*.
- Contributed to the shared and distributed memory 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

Peer-reviewed Conference & Journal Articles

Under Review **F. Gutierrez-Barragan**, S.A. Reza, A. Velten, M. Gupta. Practical Coding Function Design for Time-of-Flight Imaging. *Under Review.*

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 plugin for SnPM.

ASME IDETC 2014 D. Kaczmarek, A. Bartholomew, **F. Gutierrez**, H. Mazhar, D. Negrut. Chrono::Render: A graphical visualization pipeline for multibody dynamics simulations.

Patents & Applications

May 2017 Systems, methods, and media for encoding and decoding signals used in time of flight imaging. Application submitted by WARF.

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.

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.

2014 Frontier Fellowship - Wisconsin Institutes for Discovery.

2013 Welton Honors Summer Sophomore Apprenticeship Grant - UW-Madison Honors Program.

Software and Hardware Skills

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

Optimization Tensorflow, CVX, CVXPY, GAMS.

Parallel Tools CHTC/Condor, Charm++, MPI, OpenMP, ArrayFire, CUDA.

Hardware LabView, Verilog, optics alignment, general laboratory equipment.

Tools Unix-based systems, CMake, Makefiles, Git, LaTeX .

Web and App Jekyll, Javascript, HTML/CSS, WebGL, Flask, Windows App Dev.

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.*

Outreach and Leadership

ProCSI Co-coordinator of Promoting the Computational Science Initiative outreach program at UW-Madison 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 (2012-2016).