

# JOSH HERNANDEZ

## UCLA Vision Lab

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## Permanent Address

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## EDUCATION

*Ph.D.*, Pure Mathematics

University of California, Los Angeles (UCLA)

September 2005 - September 2015 (expected)

Supervisors: Profs. Luminita Vese (Math) and Stefano Soatto (CS)

GPA: 3.80 / 4.00

*B.Sc.*, Pure Mathematics

University of California, San Diego (UCSD)

September 2001 - June 2005

Supervisor: Professor Bill Helton

Honors Thesis: Non-Commutative Subharmonic and Harmonic Polynomials

GPA: 3.75 / 4.00.

## RESEARCH INTERESTS

Optimal and Information-Seeking Control, Image Processing, descriptor design, Visual-inertial SLAM.

## PROFESSIONAL EXPERIENCE

Graduate Student Researcher, *UCLA Vision Lab*

January 2012 – present

- *Information-Driven Exploration of Ising-Modeled Terrain*

Developed a method for efficiently exploring and mapping highly-occluded environments, choosing informative view-points using a prior on terrain shape and an efficiently-computed approximation of joint measurement entropy.

- *Visual-Inertial Navigation*

Implemented efficient numerical methods for the Corvis visual-inertial navigation system. Analyzed the ambiguity inherent in visual-inertial sensor fusion systems, and characterised the set of indistinguishable trajectories.

- *Representation Reduction for Autonomous Agents*

Developed and analyzed algorithms for the lossless compression of an autonomous agent's belief state, modulo a given task, with the aim of reducing memory and computational requirements.

Summer Intern, *Instruments Division, Jet Propulsion Lab*

July - September 2011

Contributed to the onboard image processing system of MSPI (Multiangle SpectroPolarimetric Imager) Satellite. Identified and eliminated an unusual striping artifact characteristic of that system. Advisor: Veljko Jovanovich.

Teaching Assistant, *UCLA Mathematics*

September 2005 to June 2011

Held twice-weekly discussions for several lower-and upper-division classes, to wit: Precalculus, Calculus 1 & 2, Differential Equations, Complex Analysis, Introductory C++, Algorithms and Data Structures, Advanced A & DS.

## PUBLICATIONS

- J. Dong, N. Karianakis, D. Davis, **J. Hernandez**, J. Balzer and S. Soatto. Multi-view Feature Engineering and Learning. *Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2015.
- **J. Hernandez**, K. Tsotsos and S. Soatto. Observability, Identifiability and Sensitivity of Vision-Aided Inertial Navigation. *Proc. International Conference on Robotics and Automation (ICRA)*, May 2015. **Best Paper, ICRA 2015**
- J. Helton, D. McAllaster, **J. Hernandez**. Non-Commutative Harmonic and Subharmonic Polynomials. *Integral Equations and Operator Theory*, May 2008, Vol. 61, Iss. 1, pp 77-102.

## TECHNICAL SKILLS

Proficient in C/C++, Matlab, Linux, OpenCV, Java, Bash scripting, Git. Familiar with Python, C#, SQL, HTML, JavaScript.