

RENÉ VIDAL

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EDUCATION

PhD in Electrical Engineering and Computer Science, University of California at Berkeley, 2003

- **Thesis:** Generalized Principal Component Analysis (GPCA): an Algebraic Geometric Approach to Subspace Clustering and Motion Segmentation
- **Advisor:** Shankar Sastry
- **Award:** 2003 Eli Jury Award for “outstanding achievement in the area of Systems, Communications, Control or Signal Processing”
- **Award:** 2004 Sakrison Memorial Prize for “completing an exceptionally documented piece of research”

MS in Electrical Engineering and Computer Science, University of California at Berkeley, 2000

- **Thesis:** Controlled Invariance of Discrete Time Hybrid Systems
- **Advisor:** Shankar Sastry

MS in Engineering with major in Automatic Control, Catholic University of Chile, 1997

- **Thesis:** Control of a Robot Arm using Fuzzy Logic and Image Processing
- **Advisor:** Aldo Cipriano
- **Award:** Dow Chemical Company Prize to the Valedictorian of the MS program

Diploma in Industrial Engineering with major in Electricity, Catholic University of Chile, 1997

- Summa Cum Laude
- Award to the Valedictorian of the School of Engineering
- Award to the Valedictorian of the Department of Electrical Engineering

B.S. in Industrial Engineering with major in Electricity, Catholic University of Chile, 1995

- Summa Cum Laude
- Award to the Valedictorian of the School of Engineering
- Award to the Valedictorian of the Department of Electrical Engineering

PROFESSIONAL EXPERIENCE

Full Professor

- Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD (2015 – present)
- Secondary Appointment in the Departments of Computer Science, Electrical and Computer Engineering, and Mechanical Engineering, Johns Hopkins University, (2015 – present)
- Faculty member in the Center for Imaging Science (CIS)
- Faculty member in the Institute for Computational Medicine (ICM)
- Faculty member in the Laboratory for Computational Sensing and Robotics (LCSR)

Associate Professor

- Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD (2010 – 2015)
- Secondary Appointment in the Departments of Computer Science, Electrical and Computer Engineering, and Mechanical Engineering, Johns Hopkins University, (2010 – 2015)
- Faculty member in the Center for Imaging Science (CIS)
- Faculty member in the Institute for Computational Medicine (ICM)
- Faculty member in the Laboratory for Computational Sensing and Robotics (LCSR)

Assistant Professor

- Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD (2004 – 2010)
- Secondary Appointment in the Department of Electrical and Computer Engineering, Johns Hopkins University, (2006 – 2010)
- Secondary Appointment in the Department of Computer Science and Mechanical Engineering, Johns Hopkins University, Baltimore, MD (2004 – 2010)

Visiting Professor

- Math Department, Stanford University (November 2012)
- Computer Science Department, INRIA, Paris, France (May-October 2012)
- Computer Science Department, Catholic University, Santiago, Chile, (January-March 2012)
- Grupo de Visió per Computador i Robòtica, Universitat de Girona, Girona, Spain (March 2010)
- Grupo de Visió per Computador i Robòtica, Universitat de Girona, Girona, Spain (May 2009)
- Centre de Recherche en Automatique, Université Henri Poincaré, Nancy, France (October 2008)
- Department of Information Engineering, Research School of Information, Science and Engineering, Australian National University, Canberra, Australia (November 2007)
- School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, UK (December 2006 – January 2007)
- National ICT Australia and Research School of Information, Science and Engineering, Australian National University, Canberra, Australia (January 2005)

Research Fellow

- National ICT Australia, Canberra, Australia (Fall 2003)

Research Assistant

- Department of Electrical Engineering and Computer Science, University of California at Berkeley, Berkeley, CA (1999-2003)

Research Intern

- RIACS NASA Ames, Moffet Field, CA (Summer 2002)
- NEC Research Institute, Princeton, NJ (Summer 2001)

Engineer

- DICTUC S.A., Santiago, Chile (1997-1998)

ACADEMIC HONORS

Prizes and Awards

- IAPR Fellow, 2016
- Outstanding Reviewer Award, IEEE Conference on Computer Vision and Pattern Recognition, 2015
- IEEE Fellow, 2014
- Outstanding Reviewer Award, IEEE Conference on Computer Vision and Pattern Recognition, 2013

- Best Paper Award for paper entitled “Efficient Object Localization and Pose Estimation with 3D Wireframe Models,” IEEE Workshop on 3D Representation and Recognition, 2013
- Best Paper Award for paper entitled “Joint Dictionary Learning for Categorization of Images using a Max-Margin Framework”, Pacific-Rim Symposium on Image and Video Technology, 2013
- Best Paper Award for paper entitled "Intrinsic Consensus on SO(3) with Almost-Global Convergence," IEEE Conference on Decision and Control, 2012
- J. K. Aggarwal Prize "for outstanding contributions to generalized principal component analysis (GPCA) and subspace clustering in computer vision and pattern recognition," 2012
- Best Paper Award in Medical Robotics and Computer Assisted Interventions for paper entitled “Surgical Gesture Classification from Video Data”, MICCAI 2012
- Best Paper Award Runner Up for paper entitled “*Average Consensus on Riemannian Manifolds with Bounded Curvature*”, 50th IEEE Conference on Decision and Control, 2011
- General Chairs’ Recognition Award for Interactive Papers at the 48th IEEE Conference on Decision and Control, 2009
- Outstanding Reviewer Award, IEEE International Conference on Computer Vision, 2009
- Outstanding Reviewer Award, IEEE Conference on Computer Vision and Pattern Recognition, 2009
- Young Investigator Award, Office of Naval Research, 2009
- Sloan Research Fellowship, Alfred P. Sloan Foundation, 2009
- Outstanding Reviewer Award, IEEE Conference on Computer Vision and Pattern Recognition, 2008
- VIBOT Fellowship in Vision and Robotics, 2006-2007
- NSF CAREER Award, “*Recognition of Dynamic Activities in Unstructured Environments*”, National Science Foundation, 2005
- Best Paper Award Honorable Mention (with Y. Ma.) for paper entitled “*A Unified Algebraic Approach to 2-D and 3-D Motion Segmentation*,” European Conference on Computer Vision, 2004
- Sakrison Memorial Prize for “*completing an exceptionally documented piece of research*”, University of California at Berkeley, 2004
- Eliahu Jury Award for “*outstanding achievement in the area of Systems, Communications, Control, or Signal Processing*”, University of California at Berkeley, 2003
- SSRP Continuation Award, NASA Ames, 2002
- Marcos Orrego Puelma Award, Institute of Engineers of Chile, 1998
- Dow Chemical Company Prize to Valedictorian of M.Eng. Program, Catholic University of Chile, 1997
- Valedictorian of the School of Engineering, Catholic University of Chile, 1991-1996

Fellowships and Scholarships

- Regent’s Fellowship, University of California at Berkeley, 1998-99
- President of the Republic of Chile Scholarship, 1989-96
- Honor Scholarship, Catholic University of Chile, 1994-96
- Conicyt Scholarship, Chilean National Commission for Research and Technology, 1996-97
- Juan Pablo II Scholarship, 1994-96
- Délano Foundation Scholarship, 1992-97
- Foundation of Engineers Scholarship, Catholic University of Chile, 1991-93

Honors

- Tau-Beta-Pi Honor Society, 2008-present
- Distinguished Citizen, Council of the City of Lautaro, Chile, 2004

RESEARCH INTERESTS

Machine Learning

- Convex optimization, non-convex optimization, large-scale optimization
- Representation learning: mathematics of deep learning, tensor factorization, matrix factorization, matrix completion, sparse, block sparse and low-rank representations
- Manifold learning and clustering: generalized principal component analysis (GPCA), sparse subspace clustering (SSC), low rank subspace clustering (LRSC), locally linear manifold clustering (LLMC), sparse manifold clustering and embedding (SMCE)
- Classification of time series: Binet-Cauchy kernels, DynamicBoost, Align distance

Computer Vision

- Image analysis: object recognition, semantic image segmentation, 3D object detection, pose estimation and recognition
- Video analysis: activity recognition, video summarization, semantic video segmentation, dynamic texture segmentation and recognition, motion/video segmentation
- Camera sensor networks: calibration, 3D reconstruction, surveillance
- 3D scene analysis: nonrigid structure from motion, multiple view geometry, optimal motion estimation and 3-D reconstruction, camera self-calibration, omnidirectional vision

Biomedical Image Analysis

- Cell detection and classification
- Analysis of human movements for rehabilitation therapy
- Modeling and recognition of surgical gestures and skill
- Analysis of high angular resolution diffusion images (HARDI)
- Classification of stem-cell derived cardiac myocytes
- Interactive medical image segmentation

Signal Processing

- Consensus on manifolds
- Distributed optimization

Dynamical Systems and Control

- Distances on spaces of dynamical systems
- Observability, realization and identification of hybrid systems
- Computation of controlled invariant sets using semi-definite programming
- Decidability analysis of the controlled invariance problem for discrete-time hybrid systems

Robotics

- Formation control of teams of non-holonomic robots
- Coordination and control of multiple autonomous vehicles for pursuit-evasion games
- Multiple view motion estimation and control for landing an unmanned aerial vehicle

TEACHING EXPERIENCE

Course Instructor

- Advanced Topics in Machine Learning, Johns Hopkins University, Fall 2006, Spring 2010, Spring 2014, Spring 2016, Spring 2017

- Computer Vision, Johns Hopkins University, Spring 2008, Fall 2013, Fall 2014
- Freshmen Modeling and Design, Johns Hopkins University, Fall 2006-2011, Fall 2013-present
- Biomedical Signal, Systems and Control, Johns Hopkins University, Spring 2006-2011
- Introduction to Linear Dynamical Systems, Johns Hopkins University, Spring 2007
- Advanced Topics on Computer Vision, Johns Hopkins University, Spring 2005, 2009
- Advanced Topics on Computer Vision and Robotics, UC Berkeley, Spring 2003
- Digital Signal Processing, San Francisco State University, Fall 2000
- Linear Algebra, Polytechnic Military Academy of Chile, Fall 1997

Teaching Assistant

- Calculus I, II, III, and Linear Algebra, Polytechnic Military Academy, 1996-1997
- Department of Electrical Engineering, Catholic University of Chile, 1996-1997
- Departments of Mathematics and Physics, Catholic University of Chile, 1992-1996

PROFESSIONAL ACTIVITIES

Advisory Board

- Chair of the Advisory Board of the Computer Vision Foundation (2016-present)

Award Committees

- Chair J.K Aggarwal Prize Committee (2016)
- Member J.K. Aggarwal Prize Committee (2014)

Associate Editor

- Computer Vision and Image Understanding (2016-present)
- International Journal of Computer Vision, Special Issue on Best Papers from ICCV 2015 (2016)
- Medical Image Analysis (2015-present)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (2012-present)
- SIAM Journal on Imaging Sciences (2011-present)
- IEEE Transactions on Pattern Analysis and Machine Intelligence, Special Issue on Best Papers from CVPR 2014 (2014-2016)
- Journal of Mathematical Imaging and Vision (2008-2013)
- IEEE Signal Processing Magazine, Special Issue on Dimensionality Reduction via Subspace and Manifold Learning (2009-2010)
- IEEE International Conference on Decision and Control (2008)
- 6th IFAC Symposium on Robust Control Design (2009, 2012)

Program Chair

- IEEE International Conference on Computer Vision (2015)
- IEEE Conference on Computer Vision and Pattern Recognition (2014)
- IEEE Workshop on Vision and Motion Computing (2009)
- IEEE Pacific-Rim Symposium on Image and Video Technology (2007)

Area Chair

- Artificial Intelligence and Statistics (AISTATS, 2017)
- Association for the Advancement of Artificial Intelligence (AAAI) Conference (2016, 2017)

- Neural Information Processing Systems (2015)
- Medical Image Computing and Computed Assisted Interventions (2013, 2014)
- IEEE International Conference on Computer Vision (2007, 2011, 2013)
- IEEE Conference on Computer Vision and Pattern Recognition (2005, 2013, 2017)
- Scandinavian Conference on Image Analysis (2011)

Program Committee Member

- IEEE International Conference on Computer Vision (2005, 2009, 2013), European Conference on Computer Vision (2004, 2006, 2008, 2010, 2014), IEEE Conference on Computer Vision and Pattern Recognition (2004, 2006-2009, 2013-2016), Asian Conference on Computer Vision (2007), International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (2009, 2011, 2013, 2015)
- NIPS: Neural Information Processing Systems (2005, 2011, 2013, 2014, 2016), International Conference on Machine Learning (2006, 2014), European Conference on Machine Learning (2006)
- CVPR Workshop on Nonrigid Object Recognition and Deformable Image Registration (2008), CVPR Workshop on Advanced 3D Imaging for Safety and Security (2005), International Symposium on 3D Data Processing, Visualization and Transmission (2006), Workshop on Image Registration in Deformable Environments (2006), Biomedical Engineering Symposium (2008), CVPR Workshop on Camera Networks (2010), MICCAI Workshop on Medical Computer Vision: Recognition Techniques and Applications in Medical Imaging (2010), AAAI 2010 Fall Symposium on Manifold Learning and its Applications (2010), Scandinavian Conference on Image Analysis (2011)

Workshop, Tutorial and Course Organizer

- Tutorial on the Mathematics of Deep Learning, IEEE Conference on Computer Vision and Pattern Recognition, Las Vegas, NV, USA (2016)
- Workshop on the Theory of Deep Learning, International Conference on Machine Learning, New York, USA (2016)
- Tutorial on the Mathematics of Deep Learning, IEEE International Conference on Computer Vision, Santiago, Chile (2015)
- Tutorial on Learning Multi-Subspaces in Computer Vision, IEEE Conference on Computer Vision and Pattern Recognition, Boston, MA, USA (2015)
- Tutorial on Learning Multi-Subspaces in Computer Vision, IEEE Conference on Computer Vision and Pattern Recognition, San Francisco, CA, USA (2010)
- Workshop on Dynamical Vision, IEEE International Conference on Computer Vision, Kyoto, Japan (2009)
- Invited Session on Identification of Hybrid Systems, Workshop on System Identification, Saint Malo, France (2009)
- Course on Generalized Principal Component Analysis (GPCA), IEEE Conference on Computer Vision and Pattern Recognition, Anchorage, AL, USA (2008)
- Workshop on Hybrid System Identification via Generalized Principal Component Analysis, IEEE Conference on Decision and Control, New Orleans, LA, USA (2007)
- Workshop on Dynamical Vision, IEEE International Conference on Computer Vision, Rio de Janeiro, Brazil (2007)
- Workshop on Computer Vision for Developing Regions, IEEE International Conference on Computer Vision, Rio de Janeiro, Brazil (2007)
- Course on Identification of Hybrid Systems, European Control Conference, Kos, Greece (2007)
- Course on Generalized Principal Component Analysis (GPCA), IEEE Conference on Computer Vision and Pattern Recognition, Minneapolis, MN, USA (2007)
- Workshop on Dynamical Vision, European Conference on Computer Vision, Graz, Austria (2006)

- Workshop on Dynamical Vision, IEEE International Conference on Computer Vision, Beijing, China (2005)
- Tutorial on Multiple-View Geometry for Image-Based Modeling, IEEE International Conference on Image Processing, Genoa, Italy (2005)
- Course on Generalized Principal Component Analysis (GPCA): Theory and Applications in Vision & Control, Catholic University, Santiago, Chile (2004)
- Invited Session on Observability, Observer Design and Identification of Hybrid Systems, IEEE Conference on Decision and Control, Nassau, Bahamas (2004)
- Tutorial on 3D Reconstruction and Motion Analysis of Static and Dynamic Scenes, IEEE International Conference on Robotics and Automation, New Orleans, USA (2004)
- Course on Multiple-View Geometry for Image-Based Modeling, SIGGRAPH, Los Angeles, USA (2003,2004)

Grant Review Panels

- NOIT, National Institute of Health, 2016
- Dynamic Data, National Science Foundation, 2014
- Austrian Science Fund, STAR Project, 2013
- Chilean Corporation for Science and Technology (Conicyt), 2012
- CAREER Award Panel, Computer Vision, National Science Foundation, 2012
- Austrian Science Fund, STAR Project, 2012
- Chilean Corporation for Science and Technology (Conicyt), 2011
- Cyber Physical Systems Panel, National Science Foundation, 2011
- Chilean Corporation for Science and Technology (Conicyt), 2010
- Research Grants Council (RGC) of Hong Kong, 2010
- Computer Vision Panel, National Science Foundation 2010
- Chilean Corporation for Science and Technology (Conicyt), 2009
- German Israeli Foundation, 2009
- Expeditions in Computing Panel, National Science Foundation, 2008
- Software for Real-world Systems (SRS), National Science Foundation, 2008
- CAREER Award Panel, Power Control and Adaptive Networks, National Science Foundation, 2007
- CAREER Award Panel, Computer Vision, National Science Foundation, 2007

Journal Reviewer

- **Biomedical Image Analysis and Computational Biology:** IEEE Transactions on Medical Imaging, Medical Image Analysis, PLoS Computational Biology, Computers in Biology and Medicine
- **Computer Vision and Image Processing:** International Journal of Computer Vision, IEEE Transactions on Pattern Analysis and Machine Intelligence, Computer Vision and Image Understanding, Image and Video Computing, Journal of Mathematical Imaging and Vision, IEEE Transactions on Image Processing, IET Image Processing, Journal of Electronic Imaging
- **Machine Learning:** Journal of Machine Learning Research, Pattern Recognition Letters, Neurocomputing, Pattern Recognition, IEEE Transactions on Neural Networks, IEEE Transactions on Neural Networks and Learning Systems, Journal of Classification, Pattern Analysis and Applications Journal, International Journal on Pattern Recognition and Artificial Intelligence, Engineering Applications of Artificial Intelligence, Data and Knowledge Engineering, Computational Statistics and Data Analysis, Journal of Pattern Recognition
- **Dynamical Systems and Control:** IEEE Transactions on Automatic Control, Automatica, System and Control Letters, IEEE Transaction on Control Applications and Systems, Asian Journal of Control, Control Engineering Practice

- **Robotics:** IEEE Transactions on Robotics, Robotics and Autonomous Systems, IEEE Transactions on Sensor Networks
- **Signal Processing and Information Theory:** IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, Signal Processing, Multidimensional Systems and Signal Processing, Journal of Fourier Analysis and Applications
- **Neuroscience:** Neuroscience Letters
- **Mathematics:** Foundations of Computational Mathematics

Conference Reviewer

- **Computer Vision and Image Processing:** International Conference on Computer Vision (2003, 2005, 2007, 2009), European Conference on Computer Vision (2002, 2004, 2006, 2008, 2014), IEEE Conference on Computer Vision and Pattern Recognition (2003-2009, 2015)
- **Machine Learning:** NIPS: Neural Information Processing Systems (2005, 2012, 2014), International Conference on Machine Learning (2006,2013), European Conference on Machine Learning (2006)
- **Dynamical Systems and Control:** European Control Conference (2006-2007), IEEE Conference on Decision and Control (2000-2007), Workshop on Hybrid Systems Computation and Control (2000-2003, 2008), IEEE American Control Conference (2002-2004, 2007), IFAC Symposium on System Identification (2006)
- **Robotics:** IEEE International Conference on Robotics and Automation (2006), IEEE International Conference on Intelligent Robots and Systems (2005)

SEMINARS AND INVITED TALKS

Distinguished Lectures and Keynote Speeches

1. Automatic Methods for the Interpretation of Biomedical Data. Plenary Lecture, Symposium on Computational Methods in Biology and Biomedicine, Santiago, Chile, September 2016
2. Global Optimality in Matrix and Tensor Factorization, Deep Learning, and Beyond. Plenary Lecture, Iberoamerican Congress on Pattern Recognition, Montevideo, Uruguay, November 2015
3. Algebraic, Sparse and Low Rank Subspace Clustering. Plenary Lecture, Symposium on Signal and Image Processing, and Computer Vision, Bogotá, Colombia, September 2015
4. Algebraic, Sparse and Low Rank Subspace Clustering. Plenary Lecture, 1st Annual Workshop on Data Sciences, Tennessee State University, April 2015
5. Algebraic, Sparse and Low Rank Subspace Clustering. International Conference on Intelligence Science and Big Data Engineering, Beijing, China, July 2013
6. *Subspace Clustering*, J.K. Aggarwal Prize Plenary Lecture, International Conference on Pattern Recognition, Tsukuba, Japan, 2012
7. *Global Bag of Latent Features Models for Semantic Segmentation*, Keynote Speech, ECCV Workshop on Higher-Order Models and Global Constraints in Computer Vision, Florence, Italy, 2012
8. *Distributed Algorithms for Camera Sensor Networks*, Keynote Speech, CVPR Workshop on Camera Networks and Wide Area Scene Analysis, Colorado Springs, USA, 2011
9. Keynote Speaker at the Symposium for Underrepresented Undergraduates, Johns Hopkins University, 2010
10. *Multi-Manifold Learning*. AAAI 2009 Fall Symposium on Manifold Learning and its Applications, Arlington, VA, November 2009
11. *Binet-Cauchy Kernels for the Recognition of Visual Dynamical Processes*. Plenary Lecture, Benelux meeting in Systems and Control, Spa, Belgium, March 2009
12. *Generalized Principal Component Analysis (GPCA)*. Keynote Speech, Workshop on Image Processing, Guanajuato, Mexico, August 2007

13. *Segmentation of Dynamic Scenes and Textures*. Keynote Speech, Workshop on Computational Vision, Robotics, Neurocontrol and Medical Image Processing, Guadalajara, Mexico, June 2006
14. *Segmentation of Dynamic Scenes and Textures*. Keynote Speech, Workshop on Statistical Methods in Multi-Image and Video Processing (SMVP), May 2006
15. *Toward Dynamic GPCA: Hybrid System Identification for the Analysis of Dynamic Scenes*. Sundaram Seshu Scholar Lecture, University of Illinois at Urbana Champaign, November 2005

Invited Talks at Workshops, Tutorials and Summer Schools

16. Global Optimality in Matrix and Tensor Factorization, Deep Learning, and Beyond, Data Seminar, Math Department, Johns Hopkins University, September 2016
17. Scalable Subspace Clustering, IMA Workshop on Transdisciplinary Foundations of Data Science, September 2016
18. Global Optimality in Matrix and Tensor Factorization, Deep Learning, and Beyond, IMA Workshop on Optimization and Parsimonious Modeling, January 2016
19. Globally Optimal Structured Low-Rank Matrix and Tensor Factorization, ICCV Workshop on Robust Subspace Learning and Computer Vision, December 2015
20. Object Detection, Pose Estimation and Semantic Segmentation Using 3D Wireframe Models, ICCV Workshop on 3D Scene Understanding, December 2015
21. Subspace Arrangements in Vision and Learning, Meeting on Algebraic Vision, October 2015
22. Algebraic, Sparse and Low Rank Subspace Clustering, International Computer Vision Summer School, July 2015
23. Globally Optimal Factorizations and Deep Learning, Symposium on Data Science, ShanghaiTech, June 2015
24. Discovering the Language of Surgery, CVPR Workshop on Medical Computer Vision, June 2015
25. Globally Optimal Factorizations and Deep Learning, Conference on Computational Imaging and Vision, KAUST, March 2015
26. Semantic (less) Motion and Video Segmentation, First International Workshop on Video Segmentation, European Conference in Computer Vision, September 2014
27. Algebraic, Sparse and Low Rank Subspace Clustering. Mathematical Image Analysis, Paris, January 2014
28. Computer Vision Methods in Surgery and Neuroimaging. 3rd Annual Hopkins Imaging Conference, Johns Hopkins University, November 2013
29. See All by Looking at A Few: Sparse Modeling for Finding Data Exemplars. Computer Vision Workshop, Oxford University, Oxford UK, August 2013
30. See All by Looking at A Few: Sparse Modeling for Finding Data Exemplars. Duke Workshop on Sensing and Analysis of High-Dimensional Data, Duke University, July 2013
31. Discovering the Language of Surgery. MICCAI Workshop, Tokyo University, Tokyo, Japan, May 2013
32. Discovering the Language of Surgery. Computer Vision Workshop, University of Southern California, February 2013
33. Subspace Sparsity for Classification and Clustering of High-Dimensional Data. International Workshop on Computer Vision, Siracusa, Italy, May 2012
34. *Sparsity and Rank Minimization in Unions of Subspaces*. Workshop on Sensing and Analysis of High-Dimensional Data (SAHD), Duke University, July 2011
35. *Structured Sparsity for Subspace Classification and Clustering*. Workshop on the Geometry of High Dimensional Data, Department of Mathematics, Vanderbilt University, May, 2011
36. *Segmentation and Categorization of Dynamic Scenes*. Cotesys Spring Workshop, Technical University of Munich, April 2011

37. *Processing High Angular Resolution Diffusion Images of the Brain*. Workshop on What Can Computer Vision Do for Neuroscience and Vice Versa? Janelia Farm Campus, Howard Hughes Medical Institute, October 2010
38. *Subspace Clustering*. Shanks Workshop on "Machine learning and the Analysis of High Dimensional data sets", Department of Mathematics, Vanderbilt University, September, 2010
39. *Multi-Subspace Learning and Clustering via Sparse Representation*, Tutorial on Learning Multi-Subspaces in Computer Vision, IEEE Conference on Computer Vision and Pattern Recognition, San Francisco, CA, USA, June 2010
40. *Sparse Subspace Clustering*. Forum on Geometric Aspects of Machine Learning and Visual Analytics: Recent Developments and Future Challenges, *Atlantic City, NJ, October 2009*
41. *Sparse Subspace Clustering*. Research in Imaging Sciences Workshop, Minneapolis, MN, October 2009
42. *Clustering Linear and Nonlinear Manifolds. Workshop on Multi-Manifold Data Modeling and Applications*, Minneapolis, MN, October 2008
43. *Segmentation and Fiber Clustering in Diffusion Tensor Images*. Workshop on What Can Computer Vision Do for Neuroscience and Vice Versa? Janelia Farm Campus, Howard Hughes Medical Institute, September 2008
44. *Clustering Linear and Nonlinear Manifolds using Generalized Principal Components Analysis*, Minisymposium on Hybrid Linear and Nonlinear Modeling and their Applications, San Diego CA, USA, July 2008
45. Generalized Principal Component Analysis (GPCA), Workshop on Optimization on Manifolds, Conference on Decision and Control, New Orleans LA, USA, December 2007
46. *An Algebraic Geometric Approach to Hybrid System Identification*, Workshop on Hybrid System Identification via Generalized Principal Component Analysis, Conference on Decision and Control, New Orleans LA, USA, December 2007
47. *Generalized Principal Component Analysis (GPCA)*. Summer Workshop on Language and Speech Processing, Johns Hopkins University, July 2007
48. *An Algebraic Geometric Approach to Hybrid System Identification*, Workshop on Identification of Hybrid Systems, European Control Conference, Kos, Greece, July 2007
49. Generalized Principal Component Analysis (GPCA), Tutorial at the IEEE Conference on Computer Vision and Pattern Recognition, Minneapolis, USA, June 2007
50. *Segmentation of Dynamic Scenes and Textures*. BIRS Workshop on Mathematical Methods in Computer Vision, Banff, Canada, October 2006
51. *An Algebraic Geometric Approach to Hybrid System Identification*, Workshop on Identification of Hybrid Systems, IEEE Conference on Decision and Control, Seville, Spain, December 2005
52. *Generalized Principal Component Analysis (GPCA)*, Machine Learning Summer School, Canberra, Australia, January 2005
53. *Generalized Principal Component Analysis (GPCA)*. Catholic University of Chile, December 2004
54. *Segmentation of Dynamic Scenes via Generalized Principal Component Analysis*, Workshop on Mathematics and Image Analysis, Paris, France, September 2004
55. *Reconstruction of Dynamic Scenes*, Workshop on Imaging Beyond the Pinhole Camera, Dagstuhl, Germany, June 2004
56. Tutorial on *Breakthroughs in 3D Reconstruction and Motion Analysis*, IEEE International Conference on Robotics and Automation, New Orleans, May 2003

Invited Talks at Departmental Seminars

1. Automatic Methods for the Interpretation of Visual Data, National Institute of Standards and Technology, January 2015
2. Algebraic, Sparse and Low Rank Subspace Clustering. Department of Electrical Engineering, Boston University, October 2015

3. Automatic Methods for the Interpretation of Visual Data, Quantitative Sciences Seminar, Division of Biostatistics and Bioinformatics, Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins University, October 2015
4. Automatic Methods for the Interpretation of Visual Data, Computational Neuroscience, Brain Science Institute, Johns Hopkins University, April 2015
5. See All by Looking at A Few: Sparse Modeling for Finding Data Exemplars. Department of Machine Intelligence, Peking University, October 2014
6. See All by Looking at A Few: Sparse Modeling for Finding Data Exemplars. Department of Computer Science, Shanghai Tech, October 2014
7. Algebraic, Sparse and Low Rank Subspace Clustering. Department of Computer Science, Catholic University, Chile, July 2014
8. Algebraic, Sparse and Low Rank Subspace Clustering. Department of Electrical Engineering, Northeastern University, May 2014
9. Discovering the Language of Surgery. Department of Cognitive Science, University of California at San Diego, April 2014
10. Algebraic, Sparse and Low Rank Subspace Clustering. Department of Mathematics, Purdue University, March 2014
11. Algebraic, Sparse and Low Rank Subspace Clustering. Center for Imaging Science, Johns Hopkins University, September 2013
12. Algebraic, Sparse and Low Rank Subspace Clustering. Delft University, June 2013
13. Global Bag of Latent Features Models for Semantic Segmentation, Waseda University, Japan, May 2013
14. Discovering the Language of Surgery. Department of Computer and Information Science, University of Delaware, April 2013
15. Sparse and Low Rank Subspace Clustering. Department of Electrical Engineering, Ecole Polytechnique Federale de Lausanne, April 2013
16. Sparse and Low Rank Subspace Clustering. GRASP Lab, University of Pennsylvania, March 2013
17. Sparse and Low Rank Subspace Clustering. Robotics Institute, Carnegie Mellon University, March 2013
18. Discovering the Language of Surgery. Siemens Corporate Research, Princeton, December 2012
19. Sparse Subspace Classification and Clustering. Department of Computer and Information Science, Temple, Philadelphia, December 2012
20. Sparse Subspace Classification and Clustering. Department of Computer Science, Stanford University, November 2012
21. Sparse Subspace Classification and Clustering. Department of Electrical Engineering, North Carolina State University, Raleigh, October 2012
22. Sparse Subspace Classification and Clustering. Max Plank Institute, Tubingen, October 2012
23. Visual Dictionary Learning and Latent Conditional Random Fields for Joint Object Categorization and Segmentation. Instituto Italiano de Tecnologia, October 2012
24. Consensus on Manifolds. Department of Information Engineering. University of Padova, October 2012
25. Visual Dictionary Learning and Latent Conditional Random Fields for Joint Object Categorization and Segmentation. Ecole Centrale de Paris, October 2012
26. Mosaicing, Segmentation and Categorization of Dynamic Scenes, INRIA Rhone-Alpes, Grenoble, September, 2012
27. Sparse Subspace Classification and Clustering. Ecole Polytechnique Federal Lausanne, September, 2012
28. Sparse Subspace Classification and Clustering. Department of Information Technology and Electrical Engineering, ETH, Zurich, August 2012

29. Visual Dictionary Learning and Latent Conditional Random Fields for Joint Object Categorization and Segmentation. INRIA, Paris, July 2012
30. *A Riemannian Framework for Processing High Angular Resolution Images of the Brain*, Ceremade, Université de Paris Dauphine, Paris, July 2012
31. *Mosaicing, Segmentation and Categorization of Dynamic Scenes*, INRIA, Paris, June 2012
32. *Latent Conditional Random Fields for Joint Object Categorization and Segmentation*, Microsoft Research Asia, Beijing, May 2012
33. *Latent Conditional Random Fields for Joint Object Categorization and Segmentation*, Center for Imaging Science, Johns Hopkins University, April 2012
34. *Latent Conditional Random Fields for Joint Object Categorization and Segmentation*, Department of Computer Science, Catholic University of Chile, March 2012
35. *Mosaicing, Segmentation and Categorization of Dynamic Scenes*, Department of Computer Science, University of Central Florida, February 2012
36. *A Riemannian Framework for Processing High Angular Resolution Images of the Brain*, Center for Biomedical Imaging, Catholic University of Chile, January 2012
37. *A Riemannian Framework for Processing High Angular Resolution Images of the Brain*, Laboratory for Computational Sensing and Robotics, Johns Hopkins University, November 2011
38. *A Riemannian Framework for Processing High Angular Resolution Images of the Brain*, Centre de Neuro-Imagerie de Recherche, Institute du Cerveau et de la Moelle Epinière, Paris, November 2011
39. *Clustering and Classification of High-Dimensional Data in Unions of Subspaces*, Google Research New York, August 2011
40. *Computer Vision: from Flying Robots to the Discovery of Brain Pathways*, Department of Biomedical Engineering, Johns Hopkins University, October 2010
41. *3D Motion Segmentation by Sparse Subspace Clustering*, Mathematical Imaging Group, Lunds Universitet, Sweden, May 2010
42. *Interactive Medical Image Segmentation*, Department of Biomedical Engineering, Johns Hopkins University, April 2010
43. *3D Motion Segmentation by Sparse Subspace Clustering*. Visual Geometry Group, University of Oxford, UK, September 2009
44. *Dynamic Texture Mosaicing, Segmentation, and Recognition*. Computer Vision Center, Universidad Autonoma de Barcelona, Spain, May 2009.
45. *Manifold Clustering with Applications in Computer Vision and Diffusion Weighted Imaging*. Department of Mathematics, University of Liege, March 2009
46. *Interactive Medical Image Segmentation and Image Analysis Techniques for Diffusion MRI*, I4M Seminar Series, Johns Hopkins University, March 2009.
47. *Generalized Principal Component Analysis (GPCA)*. Department of Mathematics, University of Maryland at Baltimore County, November 2008
48. *Binet-Cauchy Kernels on Dynamical Systems*. Department of Electrical and Computer Engineering and Computer Science, University of Minnesota at Minneapolis, October 2008
49. *Generalized Principal Component Analysis (GPCA)*. Centre de Mathématiques Appliquées, École Polytechnique, France, September 2008
50. *Binet-Cauchy Kernels on Dynamical Systems*. Department of Electrical Engineering and Computer Science, University of California at Berkeley, September 2008
51. *Segmentation and Fiber Clustering in Diffusion Tensor Images*. Department of Biomedical Engineering, McGill University, Canada, May 2008
52. *Dynamic Texture Mosaicing, Segmentation and Recognition*. Department of Electrical Engineering, University of Delaware, April 2008
53. *Modeling, Segmentation and Registration of Dynamic Textures*. Research School of Information, Science and Engineering, Australian National University, Canberra, Australia, November 2007

54. *Generalized Principal Component Analysis (GPCA)*. Department of Mathematics, Vanderbilt University, September 2007
55. *Modeling and Segmentation of Dynamic Textures*. Department of Electrical Engineering, Herriot Watt University, Edinburgh, UK, December 2006
56. *Binet-Cauchy Kernels on Dynamical Systems*. Department of Electrical Engineering, Princeton University, November 2006
57. *Modeling and Segmentation of Dynamic Textures*. Center for Computer-Integrated Surgical Systems and Technology, Johns Hopkins University, November 2006
58. *Dynamic GPCA: Theory and Applications in Computer Vision, Biomedical Imaging, and Dynamical Systems*. Department of Mechanical Engineering, University of Delaware, November 2006
59. *Binet-Cauchy Kernels on Dynamical Systems*. Center for Imaging Science, Johns Hopkins University, October 2006
60. *Algebraic Techniques for Segmentation and Registration with Applications to DTI and Interventional MRI*. Clinical Neuroscience Seminar, Johns Hopkins University, April 2006
61. *Generalized Principal Component Analysis (GPCA): an Algebraic Geometric Approach to Subspace Clustering*. Department of Computer Science, Stevens Institute of Technology, February 2006
62. *Segmenting a Beating Heart Using Generalized Principal Component Analysis*. IEEE Biomedical Engineering Chapter, December 2005
63. *Generalized Principal Component Analysis (GPCA)*. Department of Applied Mathematics and Statistics, Johns Hopkins University, November 2005
64. *Generalized Principal Component Analysis (GPCA)*. Department of Biomedical Engineering, Tsinghua University, October 2005
65. *Segmentation and Optical Flow for Multiple Moving Dynamic Textures*. University of California at Berkeley, June 2005
66. *Clustering Bilinear Surfaces*, Center for Imaging Science, Johns Hopkins University, April 2005
67. *Reconstruction of Dynamic Scenes using GPCA*. Siemens Corporate Research, April 2005
68. *Generalized Principal Component Analysis (GPCA)*. University of Maryland at College Park, April 2004
69. *Generalized Principal Component Analysis (GPCA)*, University of California at Berkeley, May 2004
70. *Generalized Principal Component Analysis (GPCA)*, University of Pennsylvania, March 2004
71. *Generalized Principal Component Analysis (GPCA)*, Carnegie Mellon University, February 2004.
72. *Generalized Principal Component Analysis (GPCA)*, University of California at Los Angeles, May 2003
73. *Generalized Principal Component Analysis (GPCA): an analytic approach to segmentation of static and dynamics scenes*, Princeton University, May 2003
74. *Generalized Principal Component Analysis (GPCA): an analytic approach to segmentation of static and dynamics scenes*, University of California at San Diego, April 2003
75. *Generalized Principal Component Analysis (GPCA): an analytic approach to segmentation of static and dynamics scenes*, Johns Hopkins University, March 2003
76. *Generalized Principal Component Analysis (GPCA): an analytic approach to segmentation of static and dynamics scenes*, California Institute of Technology, November 2002
77. *Segmentation of Dynamic Scenes*, University of Illinois at Urbana-Champaign, October 2002
78. *Segmentation of Dynamic Scenes from the Multibody Fundamental Matrix*, Stanford University, May 2002
79. *Structure from Motion and Pursuit-Evasion Games*, University of Southern California, November 2001
80. *The Multiple View Matrix*, University of Pennsylvania, August 2001

81. *Multi-Agent Probabilistic Pursuit-Evasion Games with Unmanned Ground and Aerial Vehicles*,
University of Illinois at Urbana-Champaign, April 2001

ADVISING

Research Scientists

- Bijan Afsari (2014-2016)
- Ben Haeffele (2015-present)

Postdoctoral Fellows

- Shahin Sefati (2014-2016), now Senior Researcher at Comcast
- Bijan Afsari (2010-2014)
- Erdem Joruk (2011-2013), now at Vispera Information Technologies Co., Turkey
- Luca Zapella (2011-2013), then Engineer at Metaio GmbH in Munich, now Engineer Project Manager at Apple in CA, USA
- Aastha Jain (2011-2012), now at LinkedIn, USA
- Avinash Ravichandran (2010-2012), now Research Scientist at Amazon
- Diego Rother (2009-2011), now Engineer at Google, USA
- Mihaly Petreczky (2006-2007), now Assistant Professor at Ecole des Mines, Douai, France

PhD Students

- Connor Lane (2016-present, PhD, CS)
- Effrosyni Mavroudi (2015-present, PhD, BME)
- Florence Yellin (2015-present, PhD, ME)
- Colin Lea (2013-present, PhD, CS, JHU, co-advised with Greg Hager)
- Manolis Tsakiris (2013-present, PhD, ECE, JHU)
- Chong You (2012-present, PhD, ECE, JHU)
- Evan Schwab (2011-present, PhD, AMS, JHU)
- Lingling Tao (2010-present, PhD, ECE, JHU)
- Siddharth Mahendran (2010-present, PhD, ECE, JHU)
- Gianni Gorospe (2009-present, PhD, BME, JHU)
- Ben Haeffele (2013-2015, PhD, BME, JHU, co-advised with Eric Young), now research scientist at JHU
- Roberto Tron (2007-2012, PhD, ECE, JHU), then post-doctoral researcher at Upenn, now assistant professor at Boston University
- Rizwan Chaudhry (2006-2012, PhD, CS, JHU), then software engineer at Microsoft, now software engineer at Nest-Google
- Ehsan Elhamifar (2006-2012, PhD, ECE, JHU), then post-doctoral researcher at UC Berkeley, then Assistant Professor at Northeastern University
- Ertan Centigul (2005-2011, PhD, BME, JHU), then research scientist at Siemens Corporate Research
- Avinash Ravichandran (2004-2010, PhD ECE, JHU), then post-doctoral researcher at UCLA, then research scientist at Amazon
- Dheeraj Singaraju (2004-2010, PhD ECE, JHU), then post-doctoral researcher at UC Berkeley, then software engineer at Google
- Alvina Goh (2004-2010, PhD BME, JHU), then adjunct assistant professor at the National University of Singapore

MSc Students

- Benjamín Béjar (2011-present, BME, JHU), now post-doctoral fellow at EPFL
- Jixin Li (2009-2010, MSc, ECE, JHU), now Lead Research Analyst at Videology
- Gagan Bansal (2007-2008, M.Sc., CS, JHU), then Research Engineering at Yahoo!, then Senior Research Software Development Engineer, now senior RSDE at Azure Machine Learning, Microsoft
- Atiyeh Ghoreyshi (2005-2006, M.S. BME, JHU), then PhD student at McGill University, then post-doc at University of Southern California, then engineer at Masimo Corporation, then senior R&D scientist at Auris Surgical Robotics

Undergraduate Students

- Claire Donnat (2015, Ecole Polytechnique)
- Bertrand Rondepierre (2013, Ecole Polytechnique)
- Soren Wolfers (2013, DAAD visiting student)
- Nicolas Jimenez (2012-2013, research assistant)
- Arunesh Mittal (2012-2013, Neuroscience, JHU)
- Patrick McClure (2012, REU student)
- James Breen (2011, REU student)
- Simon Schütz (2010, DAAD visiting student)
- Martin Wojkowsky (2010, DAAD visiting student)
- Aline Elad (2010, REU student)
- Alex Hsieh (2010, BME, JHU)
- Lucas Theis (2009, DAAD visiting student)
- Andreas Beckers (2009, DAAD visiting student)
- Leyla Isik (2009-2010, REU, BME, JHU)
- Solomon Liu (2008-2011, BME, JHU)
- Venkatesh Srinivas (2008, ME, JHU)
- James Choi (2008, ME, JHU)
- Charlie Ouyang (2008, B.S. BME, JHU)
- Vincent Yeh (2007, B.S. BME, JHU)
- Jai Madhok (2007, B.S. BME, JHU)
- Roberto Tron (2006, Visiting student), now at the JHU as a PhD student
- Matthias Behnisch (2006, Visiting student), now at Bielefeld University, Germany
- Andy Wong (2006, B.S. BME, JHU)
- Mary Ellen Pozo (2005, B.S. BME, JHU)
- Sampreet Niyogi (2004-2005, B.S. BME, JHU), now at the University of Pennsylvania as a PhD student

High School Students

- Sruti Nuthalapati (2010)
- Maddie Crowl (2009), Women in Science and Engineering (WISE) program
- Andy Tien (2006), now at JHU as an undergraduate student

UNIVERSITY COMMITTEES AND SERVICE

Advisory Board

- Tau-Beta-Pi Honor Society, Hopkins Chapter (2008-2011)

University Service

- Board of Review, Academic Council, Johns Hopkins University (2011-2014)
- Keynote Speaker at the Symposium for Underrepresented Undergraduates (2010)
- Speaker and Judge at JHU Robo Challenge (2009)
- Health Professions Committee Member (2008, 2009, 2011, 2015)
- Faculty Assembly Benefits Committee (2008, 2009)

School Service

- Faculty Search Committee, Center for Imaging Science (2014)
- Faculty Search Committee, Laboratory for Computational Sensing and Robotics (2011)
- Faculty Search Committee, Institute for Computational Medicine (2006, 2008, 2011)
- Interview Faculty Candidates for Position in Control and Dynamical Systems, Department of Electrical Engineering (2005, 2007)
- Member of Joint Curriculum Committee, Whiting School of Engineering (2005-2008)
- Taught two courses to replace faculty on leave from other departments: Computer Vision (Spring 2008) and Linear Dynamical Systems (Spring 2007)

Department Service

- Organize PhD Admissions, Center for Imaging Science (2004-2010)
- Organize Welcome to PhD students, Center for Imaging Science (2004-present)
- MSE Admissions, Department of Biomedical Engineering (2006, 2008)
- Member of Teaching Assistant Committee, Department of Biomedical Engineering (2006)
- Member of PhD Program Curriculum Committee, Department of Biomedical Engineering (2005)
- Member of Undergraduate Curriculum Committee, Department of Biomedical Engineering (2009-11)

Member of Qualifying Examination Committee

- | | | |
|------------------------|-------------------------------------|------|
| - Chong You | Electrical and Computer Engineering | 2013 |
| - Evan Schwab | Electrical and Computer Engineering | 2013 |
| - Siddharth Mahendran | Electrical and Computer Engineering | 2011 |
| - Lingling Tao | Electrical and Computer Engineering | 2011 |
| - Merve Kaya | Electrical and Computer Engineering | 2011 |
| - Roberto Tron | Electrical and Computer Engineering | 2008 |
| - Ehsan Elhamifar | Electrical and Computer Engineering | 2007 |
| - Dheeraj Singaraju | Electrical and Computer Engineering | 2005 |
| - Avinash Ravichandran | Electrical and Computer Engineering | 2005 |

Member of Graduate Board Examination Committee

- | | | |
|-----------------------|-------------------------------------|------------|
| - Evan Schwab | Electrical and Computer Engineering | 2014 |
| - Hao Jiang | Applied Mathematics and Statistics | 2014 |
| - Colin Lea | Computer Science | 2014 |
| - Lingling Tao | Electrical and Computer Engineering | 2013 |
| - Siddharth Mahendran | Electrical and Computer Engineering | 2013 |
| - Raphael Sznitman | Computer Science | 2009-09-17 |
| - Thong Do | Electrical and Computer Engineering | 2009-05-14 |
| - David Grow | Mechanical Engineering | 2009-05-05 |
| - Rizwan Chaudhry | Computer Science | 2009-05-04 |

| | | |
|------------------------|-------------------------------------|------------|
| - Amy Blank | Mechanical Engineering | 2009-04-23 |
| - Si Chen | Electrical and Computer Engineering | 2009-04-16 |
| - Zachary Pezzementi | Computer Science | 2009-03-31 |
| - Ehsan Elhamifar | Electrical and Computer Engineering | 2009-02-02 |
| - Dung Nguyen | Electrical and Computer Engineering | 2008-11-10 |
| - Eatai Roth | Mechanical Engineering | 2008-10-24 |
| - David Smith | Computer Science | 2008-08-14 |
| - Matthew Moses | Mechanical Engineering | 2008-07-15 |
| - Ertan Cetingul | Biomedical Engineering | 2008-05-05 |
| - Tomonori Yamamoto | Mechanical Engineering | 2008-03-10 |
| - Michael Kutzer | Mechanical Engineering | 2007-12-06 |
| - Netta Gurari | Mechanical Engineering | 2007-10-26 |
| - Avinash Ravichandran | Electrical and Computer Engineering | 2007-05-30 |
| - Dheeraj Singaraju | Electrical and Computer Engineering | 2007-05-01 |
| - Vinutha Kallem | Mechanical Engineering | 2007-02-23 |
| - Harsh Agarwal | Electrical and Computer Engineering | 2006-10-23 |
| - Le Lu | Computer Science | 2006-03-15 |
| - Alvina Goh | Biomedical Engineering | 2006-02-01 |
| - Yasmin Hashambhoy | Biomedical Engineering | 2005-09-06 |
| - Xiaodong Fan | Electrical and Computer Engineering | 2004-05-05 |
| - Xiangtian Dai | Computer Science | 2004-04-19 |
| - Jason Corso | Computer Science | 2004-03-23 |

Member of Thesis Proposal Committee

| | | |
|------------------------|-------------------------------------|------------|
| - Manolis Tsakiris | Electrical and Computer Engineering | 2015 |
| - Siddharth Mahendran | Electrical and Computer Engineering | 2015 |
| - Lingling Tao | Electrical and Computer Engineering | 2015 |
| - Ben Haeffele | Biomedical Engineering | 2014 |
| - Amir Pourmorteza | Biomedical Engineering | 2011 |
| - Roberto Tron | Electrical and Computer Engineering | 2010 |
| - Ehsan Elhamifar | Electrical and Computer Engineering | 2009-03-18 |
| - Raphael Sznitman | Computer Science | 2009 |
| - Rizwan Chaudhry | Computer Science | 2009 |
| - Alvina Goh | Biomedical Engineering | 2009-05-05 |
| - Avinash Ravichandran | Electrical and Computer Engineering | 2007 |
| - Dheeraj Singaraju | Electrical and Computer Engineering | 2007 |
| - Mauktik Kulkarni | Biomedical Engineering | 2005 |
| - Luis Gutierrez | Biomedical Engineering | 2005 |
| - Vincent Huang | Biomedical Engineering | 2005 |

Member of Thesis Defense Committee

| | | |
|-------------------|------------------------|------|
| - Ben Haeffele | Biomedical Engineering | 2015 |
| - Yin Chen | Computer Science | 2012 |
| - Rizwan Chaudhry | Computer Science | 2012 |

| | | |
|-----------------------------|-------------------------------------|------|
| - Ehsan Elhamifar | Electrical and Computer Engineering | 2012 |
| - Roberto Tron | Electrical and Computer Engineering | 2012 |
| - Balakrishnan Varadarajan | Electrical and Computer Engineering | 2011 |
| - Ertan Cetingul | Biomedical Engineering | 2011 |
| - Dheeraj Singaraju | Electrical and Computer Engineering | 2010 |
| - Avinash Ravichandran, PhD | Electrical and Computer Engineering | 2010 |
| - Alvina Goh | Biomedical Engineering | 2010 |
| - Hong Do, PhD | Electrical and Computer Engineering | 2009 |
| - Gagan Bansal, MSc | Computer Science | 2009 |
| - Atiyeh Ghoreyshi, MSc | Biomedical Engineering | 2006 |
| - Jason Corso, PhD | PhD Computer Science | 2005 |
| - Xiangtian Dai, PhD | PhD Computer Science | 2005 |

FUNDING

Current

1. **NSF 1618485** "RI: Small: An Optimization Framework for Understanding Deep Networks," \$450,000, 07/01/2016-06/30/2019, PI, 7% effort
2. **NSF 1618637** "CIF: Small: Collaborative Research: Sparse and Low Rank Methods for Imbalanced and Heterogeneous Data", \$250,000, 07/01/2016-06/30/2018, CoPI, 8% effort
3. **JHU** "Algorithms for Counting and Classification of Blood Cells", \$2,879,709, 10/01/15-09/30/18
4. **NIH R01HD87133-01** "GEAR - Grounded Early Adaptive Rehabilitation", \$329,643, 11/01/15-10/31/18, CoPI 10% effort
5. **NSF 1527340**, "RI: Small: Object Detection, Pose Estimation, and Semantic Segmentation Using 3D Wireframe Models," \$450,192, 09/01/15-08/31/18, PI 8% effort.
6. **NSF 1447822**, "BIGDATA: F: DKA: Learning a Union of Subspaces from Big and Corrupted Data," \$600,000, 09/1/14-08/31/17, PI, 7% effort.

Completed

7. **NIH R21HL122881-01A1**, "Computational Classification of Human Stem Cell-Derived Cardiomyocytes", \$143,587, 11/1/14-10/31/16, Co-PI, 4% effort.
8. **NSF 1335035**, "Geometry and Statistics on Spaces of Dynamical Systems for Pattern Recognition in High-Dimensional Time Series," \$391,000, 09/01/13-08/31/16, PI, 8% effort.
9. **ONR N000141310116**, "Spatio-Temporal CRF Models for Joint Categorization, Segmentation and Tracking of Objects in Videos," \$389,998, 01/01/13-12/31/16, PI, 14.62% effort.
10. **NSF 1218709**, "RI: Small: Structured Sparse Conditional Random Fields Models for Joint Categorization and Segmentation of Objects," \$449,794, 09/01/12-08/31/16, PI 4% effort.
11. **NSF 0964416**, "RI: Medium: Active Scene Interpretation by Entropy Pursuit," \$1,255,280, 7/1/10-6/31/13, coPI, 4% effort.
12. **NSF-OIA 0941362**, "CDI Type-II: Language Models for Human Dexterity", \$1,809,437, 9/1/09-8/31/13, CoPI, 8% effort.
13. **NSF-CSN 0931805**, "CPS: Medium: Hybrid Systems for Modeling and Teaching the Language of Surgery," \$1,499,828, 9/1/09-8/31/13, coPI, 8% effort.
14. **Sloan Research Fellowship**, \$50,000, 09/1/09-08/31/13, PI.
15. **ONR Young Investigator Award N00014-09-10839**, "An Optimization Framework for Simultaneous Object Categorization and Segmentation," \$510,000, 06/01/09-05/31/13, PI, 12% effort.

16. **DARPA** "OUTBIDS: Open-Universe Theory for Bayesian Inference, Decision, and Sensing", \$4,527,376, 10/01/11-03/31/13, coPI, 17% effort.
17. **NIH 5R21HL108210** "Functional Classification of Cardiomyocytes Derived from Stem Cells," \$143,587, 4/1/11-3/31/13, coPI, 4% effort.
18. **NSF-ECCS 0941463**, "CDI-Type I: Collaborative Research: A Bio-Inspired Approach to Recognition of Human Movements and Movement Styles," \$740,000, 1/1/10-12/31/12, PI, 5% effort.
19. **NSF-1005411** "Cross-Cutting Research Workshops on Intelligent Information Systems," \$308,000, 01/01/10-12/31/11, CoPI, 4% effort.
20. **ONR N00014-09-10084**, "Recognizing and Learning Dynamic Texture Categories," \$345,000, 10/1/08-9/30/12, PI, 12% effort.
21. **NSF CNS-0834470**, "Collaborative Research: Distributed Sensing via Robust Consensus on Manifolds," \$650,000, 9/1/08-8/31/10, PI, 4% effort.
22. **NSF ISS-0447739**, "CAREER: Recognition of Dynamic Activities in Unstructured Environments," \$440,000, 2/1/05-1/31/11, PI, 8% effort.
23. **ARL General Dynamics Robotics Collaborative Technology Alliance 80014MC**, "Recognition of Individual and Group Activities," \$121,943, 07/16/08-12/30/09, PI, 4% effort.
24. **JHU APL-934652** (Johns Hopkins University Applied Physics Laboratory), "Information Fusion and Localization in Distributed Sensor Systems," \$107,799, 12/17/07-8/31/09, PI D. Lucarelli, subcontractor R. Vidal, 4% effort.
25. **ONR N00014-05-10836**, "Segmenting Rigid Motions from Dynamic Textures," \$348,000, 8/1/05-7/31/08, PI, 20% effort.
26. **NSF CNS-0509101**, "Collaborative Research: An Algebraic Geometric Approach to Hybrid Systems Identification," \$350,000, 9/1/05-8/31/08, PI Y. Ma, co-PI R. Vidal, 4% effort.
27. **NIH RO1 HL082729**, "Defibrillation Mechanisms in Ischemic Hearts," \$273,425, 02/01/07-01/31/08, PI N. Trayanova, subcontractor R. Vidal, 8% effort.
28. **WSE-APL** (Whiting School of Engineering - Applied Physics Laboratory), "Advanced Video Exploitation for Unmanned Aerial Vehicles," \$300,000, 10/1/05-8/31/07, Co-PI, 4% effort.
29. **NIH-NHLBI**, "Magnetic Resonance Guided Electrophysiology Intervention," \$191,110, 11/1/04-6/30/06, PI H. Halperin, subcontractor R. Vidal, 20% effort.

PUBLICATIONS

Google Scholar (GS) Statistics as of 09/2016

- H-INDEX: 53
- Maximum Cites: 636
- Total Cites: 10694
- Total Articles: 210
- Cites/Paper: 51

Books

- [1] R. Vidal, Yi Ma and S. Sastry. *Generalized Principal Component Analysis (GPCA)*, Springer Verlag, 2016
- [2] R. Vidal, A. Heyden and Y. Ma. *Dynamical Vision*, Springer Verlag, January 2007.

Preprints

- [3] B. D. Haeffele and R. Vidal. Global Optimality in Tensor Factorization, Deep Learning, and Beyond. Preprint arXiv, abs/1506.07540, 2015.
- [4] C. You and R. Vidal. Sparse subspace clustering by orthogonal matching pursuit. Preprint arxiv, abs/1507.01238, 2015.

- [5] C. You and R. Vidal. Subspace-Sparse Representation. Preprint arXiv:1507.01307, 2015
- [6] M. Tsakiris, R Vidal. Algebraic Clustering of Affine Subspaces. Preprint arXiv:1509.06729, 2015
- [7] M. Tsakiris, R Vidal. Filtrated Algebraic Subspace Clustering. Preprint arXiv:1506.06289, 2015
- [8] M. Tsakiris, R. Vidal. Dual Principal Component Pursuit. Preprint arXiv:1510.04390, 2015
- [9] B. Afsari, R. Vidal. The Alignment Distance: A State-Space based Distance on Spaces of Finite Dimensional LTI Systems. IEEE Transactions on Automatic Control, (Under Review) 2015
- [10] B. Afsari and R. Vidal. Bundle Reduction and the Alignment Distance on Spaces of State-Space LTI Systems. IEEE Transactions on Automatic Control, (Under Review) 2016.

Refereed Journal Papers and Book Chapters

- [11] C.-G. Li and R. Vidal. A Structured Sparse plus Structured Low-Rank Framework for Subspace Clustering and Completion. IEEE Transactions on Signal Processing, 2016.
 - [12] S Swaroop Vedula, Anand O Malpani, Lingling Tao, George Chen, Yixin Gao, Piyush Poddar, Narges Ahmidi, Christopher Paxton, Rene Vidal, Sanjeev Khudanpur, Gregory D Hager, and Chi Chiung Grace Chen. Analysis of the Structure of Surgical Activity for a Suturing and Knot-Tying Task. PloS one, 11(3), 2016.
 - [13] V. Patel, H. Nguyen, and R. Vidal. Latent Space Sparse and Low-Rank Subspace Clustering. IEEE Journal of Selected Topics in Signal Processing, 2015
 - [14] H. Lobel, R. Vidal and A. Soto. Learning Shared, Discriminative, and Compact Representations for Visual Recognition. IEEE Transactions on Pattern Analysis and Machine Intelligence, 2015
 - [15] R. Tron and R. Vidal. Distributed 3-D Localization of Camera Sensor Networks from 2-D Image Measurements, IEEE Transactions on Automatic Control, 59(12):3325-3340, 2014
 - [16] G. Gorospe, R. Zhu, M. Millrod, E. Zambidis, L. Tung, and R. Vidal. Automated Grouping of Action Potentials of Human Embryonic Stem Cell-Derived Cardiomyocytes. IEEE Transactions on Biomedical Engineering, 61(9):2389-2395, 2014.
 - [17] B. Afsari, R. Vidal. Distances on Spaces of High-Dimensional Linear Stochastic Processes: A Survey. Geometric Theory of Information, Signals and Communication Technology, pp. 219-242, 2014.
 - [18] H. E. Cetingul, M. Wright, P. Thompson, and R. Vidal. Segmentation of High Angular Resolution Diffusion MRI using Sparse Riemannian Manifold Clustering. IEEE Transactions on Medical Imaging, 33(2):301–317, 2014.
 - [19] F. Ofli, R. Chaudhry, G. Kurillo, R. Vidal, and R. Bajcsy. SMIJ: Sequence of the Most Informative Joints: A New Representation for Human Skeletal Action Recognition. Journal of Visual Communication and Image Representation, 25(1):24–38, 2014.
 - [20] R. Vidal and P. Favaro. Low Rank Subspace Clustering (LRSC). Pattern Recognition Letters, 43:47–61, 2014
 - [21] R. Chaudhry, G. Hager and R. Vidal. Dynamic Template Tracking and Recognition. International Journal of Computer Vision, 105(1):19–48, 2013
 - [22] L. Zappella, B. Béjar, G. Hager, and R. Vidal. Surgical Gesture Classification from Video and Kinematic data. Medical Image Analysis, 17(7):732–745, 2013.
 - [23] E. Elhamifar and R Vidal. Sparse Subspace Clustering: Algorithm, Theory, and Applications. IEEE Transactions on Pattern Analysis and Machine Intelligence, 35(11):2765–2781, 2013
- Cited by (GS): 168**
- [24] B. Afsari, R. Tron and R. Vidal. On The Convergence of Gradient Descent for Finding the Riemannian Center of Mass. SIAM Journal on Control and Optimization, 51(3):2230–2260, 2013
 - [25] R. Tron, B. Afsari and R. Vidal. Riemannian Consensus for Manifolds with Bounded Curvature. IEEE Transactions on Automatic Control, 58(4): 921-934, 2013
 - [26] A. Ravichandran, R. Chaudhry and R. Vidal. Categorizing Dynamic Textures using a Bag of Dynamical Systems. In IEEE Transactions on Pattern Analysis and Machine Intelligence, 35(2): 342-353, 2013

- [27] E. Elhamifar and R. Vidal. Block-Sparse Recovery via Convex Optimization. *IEEE Transactions on Signal Processing*, 60(8): 4094-4107, 2012
Cited by (GS): 58
- [28] D. Singaraju, L. Grady, A. Sinop and R. Vidal. "Continuous Valued MRFs for Image Segmentation." In *Advances in Markov Random Fields for Vision and Image Processing*, MIT Press, September 2011
- [29] R. Tron, A. Terzis and R. Vidal. Distributed Image-Based 3-D Localization in Camera Sensor Networks. In *Distributed Video Sensor Networks*, Springer Verlag, pages 289-302, 2011
- [30] D. Singaraju and R. Vidal. Estimation of Alpha Mattes for Multiple Layers. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 33, no. 7, pages 1295-1309, July 2011
- [31] R. Tron and R. Vidal. Distributed Computer Vision Algorithms. *IEEE Signal Processing Magazine*, vol. 28, no. 3, pages 32-45, May 2011
- [32] R. Vidal. Subspace Clustering. *IEEE Signal Processing Magazine*, volume 28, no. 2, pages 52-68, March 2011
Cited by (GS): 228
- [33] F. Lauer, G. Bloch and R. Vidal. A Continuous Optimization Framework for Hybrid System Identification. *Automatica*, volume 47, issue 3, pages 608-613, March, 2011
- [34] A. Goh, C. Lenglet, P. Thompson and R. Vidal. A Nonparametric Riemannian Framework for Processing High Angular Resolution Diffusion Images and its Applications to ODF-based Morphometry. *Neuroimage*, vol. 56, no. 3, pages 1181-1201, February 2011
- [35] H.E. Cetingul, G. Plank, N. Trayanova and R. Vidal. Estimation of Local Orientations in Fibrous Structures with Applications to the Purkinje System. *IEEE Transactions on Biomedical Engineering*, vol. 58, no. 6, pages 1762-1772, February 2011
- [36] A. Ravichandran and R. Vidal. Video Registration Using Dynamic Textures. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, volume 33, number 1, pages 158 - 171, January 2011
- [37] S. Rao, R. Tron, R. Vidal, and Y. Ma. *Motion Segmentation in the Presence of Outlying, Incomplete, or Corrupted Trajectories*. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, October 2010
Cited by (GS): 92
- [38] J. Daafouz, M.D. Di Benedetto, V.D. Blondel, G. Ferrari-Trecate, L. Hetel, M. Johansson, A.I. Juloski, S. Paoletti, G. Pola, E. De Santis, and R. Vidal. Switched and Piecewise Affine Systems. In *Handbook of Hybrid Systems Control, Theory, Tools, Application*, pp. 87–137, Cambridge University Press, 2009
- [39] R. Vidal. *Recursive Identification of Switched ARX Systems*. *Automatica*, volume 44, number 9, pages 2274-2287, September 2008
Cited by (GS): 67
- [40] R. Vidal, R. Tron and R. Hartley. Multiframe Motion Segmentation with Missing Data Using PowerFactorization and GPCA. *International Journal of Computer Vision*, volume 79, number 1, pages 85-105, August, 2008
Cited by (GS): 98
- [41] R. Vidal and R. Hartley. *Three-View Multibody Structure from Motion*. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, volume 30, issue 2, pages 214-227, February 2008
Cited by (GS): 88
- [42] S. Paoletti, A. Juloski, G. Ferrari-Trecate, and R. Vidal. Identification of Hybrid Systems: A Tutorial. *European Journal of Control*, volume 14, number 2-3, pages 242-260, July 2007
Cited by (GS): 198
- [43] V. Vishwanathan, A. Smola, and R. Vidal. *Binet-Cauchy Kernels on Dynamical Systems and its Application to the Analysis of Dynamic Scenes*. *International Journal of Computer Vision*, volume 73, issue 1, pages 95-119, June 2007
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- [44] R. Vidal. *Segmentation of Dynamic Scenes Taken by a Central Panoramic Camera*. In *Imaging Beyond the Pinhole Camera*, volume 33, pages 125-142, Springer Verlag, December 2006
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