

Stefano Soatto

CURRICULUM VITÆ

December 2009

PERSONAL AND CONTACT INFORMATION

Born in Padova - Italy, on March 19th, 1968. Dual Citizen of Italy and the United States.
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RESEARCH AND TEACHING INTERESTS

Shape representation, modeling and estimation; motion estimation and control; target tracking; image registration; texture modeling and recognition; visual accommodation; visual insertion; human-machine interfaces; image-based modeling and rendering; detection and estimation theory; statistical learning theory; system identification theory; nonlinear filtering; nonlinear control; autonomous navigation; assisted surgery; medical imaging; statistical inference on manifolds; Monte carlo filtering; statistical dimensionality reduction; image processing; image coding; image compression; human visual perception; visual psychophysics; hybrid system identification; computational biology; computational aesthetics.

PROFESSIONAL EXPERIENCE

University of California, Los Angeles - CA

Professor of Computer Science (05–present)
Professor of Electrical Engineering (08–present)
Associate Professor of Computer Science (02–05)
Assistant Professor of Computer Science (00–02)

Washington University, St. Louis - MO

Adjunct Associate Professor of Electrical Engineering (02–03)
Associate Professor of Electrical Engineering (00–01, on leave)
Associate Professor of Biomedical Engineering (00–01, on leave)
Assistant Professor of Biomedical Engineering (99–00)
Assistant Professor of Electrical Engineering (97–00)

California Institute of Technology, Pasadena - CA

Visiting Associate in Computation and Neural Systems, (07–09)
Visiting Associate in Control and Dynamical Systems, (02–07)
Postdoctoral Research Associate (96)

Harvard University, Cambridge - MA

Postdoctoral Research Associate (96–97)

Università degli Studi di Udine, Udine - Italy

Ricercatore (Assistant Professor) of Mathematics and Computer Science (95–98, on leave)

EDUCATION

California Institute of Technology, Pasadena - CA

Ph.D. in Control and Dynamical Systems (6/93-6/96)

Thesis: "A Geometric Framework for Dynamic Vision"

Committee: John Doyle, Christof Koch, Jerrold Marsden, Richard Murray, Pietro Perona (Chair)

M.S. in Electrical Engineering (9/92-6/93) G.P.A. 4.0/4.0

Università degli studi di Padova, Padova - Italy

Laurea in Ingegneria Elettronica (highest honors) (9/87-7/92)

Thesis: "Stima della struttura di una scena e del moto dell'osservatore mediante il filtro di Kalman"

G.P.A. 110/110 *e Lode*, advisor G. Picci.

University of California, Berkeley - CA

E.A.P. Fellow (Visiting Student in Electrical Engineering and Computer Science) (8/90-6/91)

Liceo Ginnasio Tito Livio, Padova - Italy

Maturità Classica (9/82-7/87)

AWARDS

Best Poster Award IEEE Intl. Conf. on Comp. Vis. and Patt. Recogn., 2004 (with P. Favaro).

Outstanding Reviewer Appreciation IEEE Transactions on Automatic Control, 2002.

Okawa Foundation Reseach Award in Telecommunications, 2001.

David Marr Prize (with Y. Ma, J. Kosecka and S. Sastry of U.C. Berkeley), 1999. Highest honor bestowed in the field of Computer Vision. Awarded bi-annually by the IEEE Computer Society. Sponsored by IEEE and Microsoft. Presented at the Intl. Conf. on Computer Vision (ICCV), Kerkyra - Greece, September 1999, for work on "Euclidean reconstruction and reprojection up to subgroups".

Outstanding Paper Award (with R. Brockett of Harvard), 1998. Awarded annually by the IEEE Computer Society, PAMI Technical Committe. Sponsored by IEEE and Siemens. Presented at the IEEE Intl. Conf. on Computer Vision and Pattern Recognition (CVPR), Santa Barbara - CA, June 1998, for work on "Optimal structure from motion: local ambiguities and global estimates".

National Science Foundation CAREER Award for research on "Controllable Visual Cues", CISE Directorate, 1998.

Fondazione Gini *A. Gini fellowship*, 1992-93 and 1994-95.

Università di Padova *Research Abroad Fellowship in Mathematics* 1993-94.

PROFESSIONAL SERVICES AND EDITORIAL ACTIVITIES

Conference Program Committee and Chairmanship

- International Conference on Advanced Video and Signal Based Surveillance, AVSS2009 (Program Committee, 2009)
- International Conference on Image Analysis and Processing (ICIAP) (Program Committee, 2009)
- Workshop on Motion and Video Computing (WMVC) (Program Committee, 2008; General Chair, 2009)
- SPIE workshop on computer vision and image analysis in the study of art (Program Committee, 2007)
- Workshop on Photometric Analysis for Computer Vision (PACV '07), General Chair; Rio de Janeiro, October 2007
- Workshop on Dynamic Vision, (Rio de Janeiro, 2007; Kyoto, 2009)

- Beyond Multiview Geometry, 2007
- International Conference on Image Analysis and Processing (ICIAP), 2007, Reggio Emilia, Italy; 2009 Vietri, Italy.
- Scale Space and Variational Methods, Ischia - Italy, Program Committee, June 2007.
- Tibet Workshop on Dynamic Vision, 2006
- Robotics Science and Systems, DGC Workshop, 2006
- NIPS 2005
- Intl. Conf. on Scale-Space and PDE Methods, Hofgeismar - Germany, Program Committee, April 2005
- IEEE Workshop on Motion and Video Computing, Program Co-Chair, January 2005.
- Asian Conference of Computer Vision (ACCV), Area Chair 2010, Queenstown, New Zealand
- IEEE Intl. Conf. on Computer Vision and Pattern Recognition (CVPR):
 - Program Committee 1999 (Fort Collins),
 - Program Committee 2000 (Hilton Head),
 - Program Committee 2001 (Kauai),
 - (no conference in 2002 due to ICCV being in North America),
 - Demo Chair 2003 (Madison),
 - Area Chair 2004 (Washington),
 - Program Co-Chair 2005 (San Diego).
 - Area Chair 2010 (San Francisco)
- 3DPVT 2004, Program Committee, Thessaloniki, Greece.
- Workshop on Nonrigid and Articulated Motions , Program committee, 2004 (Washington - DC).
- European Conference on Computer Vision (ECCV; bi-annual):
 - Area Chair 2002 (Kopenhagen),
 - Area Chair 2004 (Prague).
 - Area Chair 2005 (Graz) (turned down invitation).
- Intl. Conf. on Computer Vision (ICCV; bi-annual):
 - Program Committee 2003 (Nice).
 - Area Chair, 2005 (Beijing)
 - Area Chair, 2009 (Kyoto)
 - Program Chair, 2011 (Barcelona)
- IEEE Conference on Decision and Control: Program Committee 2000 (Sydney).
- Mathematical Theory of Networks and Systems: Program Committee 2000 (Perpignan).
- IEEE Workshop on Video Registration: Program Committee 2001 (Vancouver), Program Committee 2003 (Nice).
- Workshop on Generative Model-based Vision: Program Committee 2002 (Kopenhagen).
- Workshop on dynamic modeling of visual scenes: Program Committee 2002 (Kopenhagen).
- Intl. Conf. on Patt. Recog. (ICPR): Program Committee 2004.
- Worskshop on Statistical and Computational Theories of Vision: Program Committee 2003.
- Workshop on Computer Vision for the Nanoscale: Program Committee 2003 (Madison).
- IEEE Workshop on Variational, Geometric and Lagrangian Methods in Computer Vision: Program Committee 2003 (Nice).
- Workshop on Multimodal User Authentication: Program Committee 2003 (Santa Barbara).
- Intl. Symposium of 3D Modeling: Program Committee 2003.

- Workshop on Variational and Level Set Methods (VLSM): Program Committee 2003.

Editorial activity

- IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Associate Editor (2003–2008).
- International Journal of Computer Vision, Member of the Editorial Board (2004-present).
- Member of the Editorial Board, Foundations and Trends in Computer Vision and Graphics, (2003–present).

Referee: journals Proceedings of the IEEE, 2006, Medical Image Analysis, 2006, Journal of Mathematical Imaging and Vision, 2006; Science, 2004; Foundations of Computational Mathematics, 2003; Computer Vision and Image Understanding, 2003; Image and Vision Computing (2004) SIAM Journal of Applied Mathematics; Automatica (2/2004), International Conference on Visual Languages and Computing (5/03), IEEE Transactions on Information Theory; IEEE Transactions on Robotics and Automation; IEEE Transactions on Pattern Analysis and Machine Intelligence; IEEE Transactions on Control Systems Technology; Systems and Control Letters; IEEE Transactions on Automatic Control (5/02, 5/03); IEEE Transactions on Image Processing (2006, 2007); the International Journal of Computer Vision; Computer Vision, Graphics and Image Processing; Journal of the Optical Society of America A, ACM Computing Survey.

Referee: books Springer Verlag, 2006; SIAM, June 2002; Springer Verlag, Series “Applications of Mathematics”, 1999.

Review panels and review boards: Israel Science Foundation (2006, invitation declined); The Netherlands Organization for Scientific Research (NWO) (2006, invitation declined); Member of the Technical Review Board (TRB) and Peer Review Panel (PRP) for NASA’s New Millennium Program (NMP), Member of the Scientific Review Board for NASA’s TGAL Program (Terrain-Guided Automatic Landing System), January–September 2006; NSF CISE Area Study (October 2005); AFOSR/ARL, July 2003, CoRe UC Discovery Grant review board, Organizational Committee for a proposed Center for Computational Science and Engineering, UCLA; JPL Mars Landing “DIMES” review board, 4/10/02, NSF (Division on Computer and Information Sciences, 1999, April 2001, November 2001, June 2002, November 2003); ARO (Mathematics and Computer Science Division, 2000); AFOSR (Mathematics, Dynamics and Control, January 2002);

INVITED PRESENTATIONS

Distinguished and Named Lectures Azriel Rosenfeld Distinguished Lecture Series, University of Maryland, 2010; Keynote Speaker, Workshop on Dynamic Vision (WDV) 2009, Kyoto; Distinguished Lecture Series, UC Irvine, 5/8/2009; Plenary Speaker, International Conference on the Dynamics of Information Systems (Gainesville, January 29, 2009); Keynote Speaker, Beyond Multiview Geometry: Robust Estimation and Organization of Shapes from Multiple Cues, CVPR Workshop, Minneapolis, June 2007; University of Wisconsin - Madison, Computational Sciences Distinguished Lecture Series (2003), Stanford University, Broad Area Colloquium Series (2002), Semi-plenary talk, IFAC Symposium on System Identification (Rotterdam), 2003.

Tutorials and mini-courses Tutorial on active vision at CDC 2005, Semi-plenary talk, IFAC SYSID, 2004; Intl. Conf. on Adv. Robotics (ICRA 2003), tutorial on 3-D vision; SIGGRAPH 2003 (San Diego), SIGGRAPH 2004 (Los Angeles): tutorial on 3-D vision; 3rd European Control Conference (ECC ’95), the Mathematical Theory of Networks and Systems (MTNS ’98), Summer School for Ph.D. candidates in Systems and Controls (Bertinoro - Italy, 1999), International Conference on Robotics and Automation (ICRA ’00), “Dynamic System Identification in Computer Vision”, Europ. Conf. on Comp. Vision (ECCV, May 27, 2002), UCLA Extension short course on 3D reconstruction, Sept. 2002, “3D reconstruction”, 3DPVT, Padova - Italy, June 2002.

Invited Workshops Workshop on Perceptive Social Agents and Robots, UCSD Jan 2003, Stanford Computer Forum, 3/18/2002; NASA AMES Research Center, 3/19/2002; NIH, Department of Health and Human Services, Workshop on “Development of new tools in computational neuroscience”, September 2001; NSF/ARO Workshop on *Vision and Control*, Block-Island, May 1997; Microsoft Research Faculty Summit, July 2002.

Institutes Institute for Mathematics and Its Applications (IMA), Minneapolis; Thematic Year on Imaging. Fields Institute for Research in Mathematical Sciences, Toronto – ON, August 2001; Institute for Mathematics and Its Applications, “Mathematics and Multimedia” program, Minneapolis - MN, October-November 2000. IPAM, “Emerging Applications of Inverse Problems Techniques to Imaging Science” (member of the organizing committee).

Department and group seminars Cymer Center Seminar UCSD (10/23/09); UC Berkeley (10/27/09); LIDS Colloquium, MIT (4/14/09). University of Southern California, CS Department Colloquium (2006); University of Pennsylvania, Department Colloquium (2003), University of Wisconsin - Madison, Computational Sciences Distinguished Lecture Series (2003), Stanford University, Broad Area Colloquium Series (2002), University of Illinois at Urbana-Champaign (CSL '01); New York University (Neuroscience '01); University of Maryland (CFAR '01), UCLA (Electrical Engineering '98, Computer Science '99, Cognitive Science '01, Levelset seminar '01); University of Pennsylvania (Computer and Information Science '95, '97); Cambridge University (Engineering Science '95), Arizona State University (Mathematics '95), University of Connecticut (Electrical Engineering '95), Princeton University (Electrical Engineering '95), U.C. Berkeley (Electrical Engineering and Computer Science '97), Scuola Normale Superiore ('93), Harvard University (Applied Sciences '95), MIT (LIDS '95, '99, AI Lab '93), Georgiatech (College of Computing '96), Brown University (Applied Mathematics '97), U.C. Santa Barbara (Electrical and Computer Engineering '97, Mechanical and Environmental Engineering '00), Washington University (System Science and Mathematics '95, Electrical Engineering '97), University of Minnesota (Electrical Engineering '99), Boston University (Computer Science '99), Consiglio Nazionale delle Ricerche ('92), Caltech (Control and Dynamical Systems '96, '00, Electrical Engineering '94).

Industry research seminars Intel (Santa Clara, CA '00), Microsoft Research (Redmond, WA '00), Microsoft Research (Cambridge, U.K. '00), Geometrix INC. (Santa Clara, CA '00), NEC Research (Princeton, NJ '95, '97).

ADVISING

Current Postdocs

- Ganesh Sundaramoorthi (Ph.D., Georgia Tech)

Current Graduate Students

- Yifei Lou (UCLA Math)
- Daniel O'Connor (UCLA Math)
- Taehee Lee
- Teresa Ko
- Zhao Yi
- Michalis Raptis
- Jason Meltzer
- Brian Fulkerson
- Kamil Wnuk
- Jeremi Sudol
- Brian Taylor

- Alper Ayvaci

Former students and postdocs

- Eagle Jones (Ph.D., UCLA, 2009), Large scale visual navigation and localization. Now at McKinsey Consulting Group.
- Andrea Vedaldi (Ph.D., UCLA, 2008), Outstanding PhD Thesis, now at Oxford University, U.K.
- Alessandro Bissacco (Ph.D., UCLA, 2006), Unsupervised modeling of visual actions. Now at Google
- Sylvain Boltz (Ph.D., INRIA-Sophia, France), now at Ecole Polytechnique, Paris, France
- George Scarlatis (M.D./Ph.D. Biomedical Engineering, UCLA), retinal prosthetics (co-advisor), now at the University of Kentucky
- Emmanuel Prados (Ph.D., Ecole Normale Supérieure and INRIA-Sophia, France) now Researcher, INRIA Rhône-Alpes, Grenoble – France
- Fabio Cuzzolin (Ph.D., University of Padova - Italy), now Assistant Professor (Lecturer), Oxford Brookes University.
- Chae-Joi Young (Ph.D., Korean Institute of Advanced Science and Technology, Korea)
- Byung-Woo Hong (Ph.D., Oxford University, U.K.), now Assistant Professor, Chun-Ang University, Seoul, Korea
- Gregorio Guidi (Ph.D., Scuola Normale Superiore, Pisa), now Analyst, Central Bank of Italy
- Haibin Ling (Ph.D., University of Maryland), now Assistant Professor, Temple University
- Daniele Fontanelli (Ph.D., University of Pisa), now with University of Pisa
- Gianfranco Doretto (M.S./Ph.D., UCLA, 00-05), Dynamic textures, now at GE Global Research, Niskayuna - NY.
- Kerry Connor (B.S., UCLA, 03-04);
- Daniel Cremers (Postdoc 02-04), now Full Professor at the Technical University, Munich (TU München), Germany.
- Siddharth Manay (Postdoc 03-04), now at Lawrence Livermore National Labs.
- Hailin Hin (Ph.D. 98-04), Now at Adobe Research.
- Paolo Favaro (Ph.D., 99-04), now Associate Professor (Reader), Heriot-Watt University, Edinburgh, U.K.
- Payam Saisan (M.S. EE, 00-04), Facial motion analysis, now at HRL (Hughes Research Labs).
- Esha Datta (Visiting Student, 02, Stanford University).
- Thomas Gazagnaire (Visiting Student, 02, Ecole Normale Supérieure, Lyon).
- Nicola Moretto (Ph.D. 2003, EE, University of Padova - Italy; co-advisor).
- Alessandro Duci (Ph.D. 2003, Mathematics, Scuola Normale Superiore, Pisa; co-advisor), now at Intel Research, Santa Clara.
- Federico Guido (Ph.D. 2002, EE, University of Genova - Italy).
- Marco Turetta (D. Ing. 2002, EE, University of Padova - Italy; co-advisor).
- Rene Vidal, (Ph.D 2002, EECS, UC Berkeley; co-advisor in 2001/2002), now Assistant Professor at Johns Hopkins University.
- Francesco Nori (Laurea 2001, CS, Università di Padova; co-advisor).
- Toshiya Ogonuki, (Postdoc 2000, Japan Radio Company).
- Alessandro Chiuso, (Ph.D. 2000, EE, Università di Padova; co-advisee); Now Associate Professor, Università di Padova, Italy.

- Loris Vicario, (Laurea 2000, CS, Università of Udine; co-advisee).
- Udeepa Bordoloi (M.S. 1999, EE, Washington University).
- Diego Crovato, (Laurea 1996, CS, Università di Udine).
- Jonni Meneghel, (Laurea 1997, CS, Università di Udine).
- Claudio Tomasella, (Laurea 1998, CS, Università di Udine).

PATENTS

“Apparatus and Method for the Interactive Customization of Eyeglass Frames” (US Patent 6,944,327)

September 13, 2005; filed November 3, 2000; Provisional filed November 4, 1999.

“Apparatus and Method for Tracking Handwriting from Visual Input” (US Patent 6,044,165)

with M. Munich and P. Perona.

RECREATION

Arts Co-founder and saxophonist of the Jazz quintet *Primigenia* (Italy, 1984-1992). The now quartet is still active with recordings and performances throughout Italy. Organizer of several concerts and music festivals. Finalist in the “Certamen Ciceronianum”, an international competition in the translation of Cicero, Arpino – Italy, 1986.

Sports Member of the National Rowing Team (Italy, 1982-1986). Twice second at the National Championships (single scull), twice winner of European Regattas (Villach, Austria, 1984-1986). Competitor in regional-level ski races (1982-1986).

References

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- [2] P. Favaro and S. Soatto. *3-D Shape Estimation and Image Restoration: Exploiting Defocus and Motion Blur*. Springer Verlag, December 2006.
- [3] Y. Ma, S. Soatto, J. Kosecka, and S. Sastry. *An invitation to 3D vision, from images to geometric models*. Springer Verlag, 2003.
- [4] C. Schmid, S. Soatto, and C. Tomasi (eds). *Proceedings of the International Conference on Computer Vision and Pattern Recognition*. IEEE Press, June 2005.
- [5] S. Soatto and A. Bissacco. *Homeland security*, chapter Visual detection and classification of humans, their pose, and their motion. G. Franceschetti (Ed.), Artech House, 2008.
- [6] S. Soatto. *Modeling, Estimation and Control*, chapter On the distance between non-stationary time series. A. Chiuso, A. Ferrante and S. Pinzoni (Eds.), Springer Verlag, 2007.
- [7] G. Doretto and S. Soatto. *The Handbook of Texture Analysis*, chapter From Dynamic Texture to Dynamic Shape and Appearance Models: An Overview. Majid Mirmehdi (Ed.), World Scientific, 2007.
- [8] S. Manay, D. Cremers, B.-W. Hong, A. Yezzi, and S. Soatto. *Statistical analysis of shapes (modeling and simulation in science, engineering and technology)*, chapter Integral Invariants and Shape Matching, pages 137–167. Birkhauser, 2006.
- [9] G. Doretto and S. Soatto. *The Handbook of Mathematical Models in Computer Vision*, chapter An Overview of Dynamic Textures. N. Paragios, Y. Chen and O. Faugeras (Eds.), Springer Verlag, 2005.

- [10] S. Soatto, A. J. Yezzi, and A. Duci. *Geometric Level Set Methods in Imaging, Vision and Graphics*, S. J. Osher and N. Paragios (Eds.), chapter Region matching and tracking under deformations and occlusions, pages 319–340. Springer Verlag, 2003.
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- [12] A. Yezzi, S. Soatto, A. Tsai, and A. Willsky. *Mathematics and Multimedia*, chapter Curve and Surface Evolution for Image Segmentation and Stereo Reconstruction Using the Mumford-Shah Functional. IMA, 2002.
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- [16] S. Soatto and P. Perona. *Structure-independent visual motion control on the essential manifold*, chapter Sensory Systems, pages 869–876. IFAC Press, Feb. 1995.
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- [19] B.-W. Hong, S. Soatto, and L. Vese. Enforcing local context into shape statistics. *Advances in Computational Mathematics*, Special issue on Mathematical Imaging 2009.
- [20] P. Favaro, S. Soatto, M. Burger, and S. Osher. Shape from defocus via diffusion. *IEEE Trans. Pattern Anal. Mach. Intell.*, 30(3):518–531, March 2008.
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- [22] H. Jin, A. Yezzi, and S. Soatto. Mumford-shah on the move: Region-based segmentation on deforming manifolds with application to the reconstruction of shape and appearance from multiple images. *Journal of Mathematical Imaging and Vision*, 29(2-3):219–234, November 2007.
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- [57] E. Prados, N. Jindal, and S. Soatto. A non-local approach to shape from ambient shading. In *Proc. of the Intl. Conf. on Scale-Space and Variational Methods (SSVM), Voss – Norway*, June 2009.
- [58] M. Raptis, K. Wnuk, and S. Soatto. Flexible dictionaries for action classification. In *Proc. of the Workshop on Machine Learning for Visual Motion Analysis (MLVMA)*, October Marseille, France, 2008.
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