

LORIS BAZZANI

COMPUTER VISION SCIENTIST AT AMAZON

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<http://scholar.google.com/citations?user=1cdNGL4AAAAJ&hl=en>

CURRENT POSITION

Amazon

Jan 2016-now

Computer Vision Scientist in the Machine Learning group

PREVIOUS EXPERIENCE

Dartmouth College

Jan 2014-Dec 2015

Postdoc at the Visual Learning group

- Topics: object localization and detection in images, deep learning, salience prediction
- Supervisor: Prof. L. Torresani

University of Verona

Dec 2013

Research Collaborator

- Topic: object recognition
- Supervisor: Dr. M. Cristani

Italian Institute of Technology

Dec 2011–Nov 2013

Postdoc at the Pattern Analysis and Computer Vision group

- Topics: semi-supervised object recognition, person re-identification and individual-group tracking
- Supervisor: Prof. V. Murino

University of British Columbia

May–Nov 2010

Research Intern at the Laboratory for Computational Intelligence

- Topics: deep learning and attentional models
- Supervisor: Prof. N. de Freitas

EDUCATION

University of Verona

Jan 2009–May 2012

Ph.D. in Computer Science

- PhD Thesis: Beyond multi-target tracking: statistical pattern analysis of people and groups.
- Topics: person re-identification, individual-group tracking and attentional models
- Advisors: Prof. V. Murino, Dr. M. Cristani
- Committee Members: Prof. A. Del Bimbo, Prof. R. T. Collins

University of Verona

Sep 2006–Dec 2008

M.S. in Intelligent and Multimedia Systems

- Thesis topics: particle filtering and multi-target tracking
- Advisors: Prof. V. Murino, Dr. M. Cristani
- *Summa cum laude*

University of Verona

Sep 2003–Dec 2006

B.S. in Information Technology

- Thesis topics: classification, MRI, and mental health application
- Advisors: Prof. V. Murino, Dr. U. Castellani

SCIENTIFIC INTERESTS

- Computer Vision** Object Recognition, Video Content Analysis, Feature Learning, Visual Tracking, Attentional Models, Social Interaction Modeling, Person Re-identification
- Machine Learning** Large-scale Learning, Video Representation, Deep Learning, Dynamic Bayesian Nets, Sequential Monte Carlo Methods, Bayesian Non-parametric Models, Bayesian Optimization, Reproducing Kernel Hilbert Spaces

AWARDS AND GRANTS

- **IBM Best Student Paper Award**, track: Computer Vision at International Conference on Pattern Recognition ICPR, 2010
- **Scholarship** from University of Verona that supported my Ph.D. from Jan. 2009 to Dec. 2011
- **Scholarship** from EU-Project FP7 SAMURAI, grant FP7-SEC-2007-01 No. 217899, that contributed to support my Ph.D. from Jan. 2009 to Dec. 2011
- **Travel grant** from University of British Columbia to attend Neural Information Processing Systems, 2010
- **Travel grant** from International Machine Learning Society to attend the International Conference on Machine Learning, 2011

TEACHING

- Dartmouth College** Winter 2015
Machine Learning
- Tutor of the undergrad course taught by Prof. L. Torresani
- Italian Institute of Technology** Winter 2013
An Introduction to Machine Learning and Computer Vision
- Course for Ph.D. students
 - Organized in collaboration with other members of PAVIS group
- University of Modena and Reggio Emilia** Spring 2011
Person Re-identification
- Person Re-identification: a recent issue for the video surveillance community and a technique for approaching it
 - Held at the Short Spring School in Surveillance
 - Organized in collaboration with Dr. M. Cristani

PUBLICATIONS

Blue color = top-tier computer vision/machine learning conferences or journals.

Person re-identification

- L. Bazzani, M. Cristani, and V. Murino. SDALF: Modeling human appearance with symmetry-driven accumulation of local features, Person Re-identification, 2014.
- D. Figueira, L. Bazzani, H.Q. Minh, M. Cristani, A. Bernardino, and V. Murino, Semi-supervised multi-feature learning for person re-identification, International Conference on Advanced Video and Signal-based Surveillance (AVSS), 2013.
- P. Salvagnini, L. Bazzani, M. Cristani, and V. Murino, Person re-identification with a PTZ camera: an introductory study, International Conference on Image Processing (ICIP), 2013.
- L. Bazzani, M. Cristani, and V. Murino. Symmetry-driven accumulation of local features for human characterization and re-identification, Computer Vision and Image Understanding (CVIU), 2013.
- B. I. Barbosa, M. Cristani, A. Del Bue, L. Bazzani, and V. Murino, Re-identification with RGB-D sensors, In 1st International Workshop on Re-Identification, 2012.
- L. Bazzani, M. Cristani, A. Perina, V. Murino, Multiple-shot person re-identification by chromatic and epitomic analyses, Pattern Recognition Letters, 2012.
- D. S. Cheng, M. Cristani, M. Stoppa, L. Bazzani, V. Murino, Custom pictorial structures for re-identification, British Machine Vision Conference (BMVC), 2011.

- L. Bazzani, M. Cristani, A. Perina, M. Farenzena, and V. Murino, Multiple-shot person re-identification by HPE signature, International Conference on Pattern Recognition (ICPR), 2010.
- M. Farenzena, L. Bazzani, A. Perina, V. Murino, and M. Cristani Person re-Identification by symmetry-driven accumulation of local features, International Conference on Computer Vision and Pattern Recognition (CVPR), 2010.

Attentional Models

- M. Denil, L. Bazzani, H. Larochelle, and N. de Freitas, Learning where to attend with deep architectures for image tracking, *Neural Computation*, 2012.
- L. Bazzani, N. de Freitas, H. Larochelle, V. Murino, J. Ting, Learning attentional policies for object tracking and recognition in video with deep networks, International Conference on Machine Learning (ICML), 2011.
- L. Bazzani, N. de Freitas, J. Ting, Learning attentional mechanisms for simultaneous object tracking and recognition with deep networks, Workshop on Deep Learning and Unsupervised Feature Learning at the Conference on Neural Information Processing Systems (NIPS), 2010.

Object Recognition and Classification

- M. San Biagio, H. Q. Minh, L. Bazzani, V. Murino. Approximate Log-Hilbert-Schmidt distances between covariance operators for image classification. International Conference on Computer Vision and Pattern Recognition (CVPR), 2016.
- L. Bazzani, A. Bergamo, D. Anguelov, L. Torresani. Self-taught object localization with deep networks. In IEEE Winter Conference on Applications of Computer Vision (WACV), 2016.
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework in vector-valued reproducing kernel Hilbert spaces for manifold regularization and co-regularized multi-view learning, *Journal of Machine Learning Research*, (JMLR), 2016.
- M. San Biagio*, L. Bazzani*, M. Cristani, V. Murino, Weighted bag of visual words for object recognition, In IEEE International Conference on Image Processing (ICIP), 2014. (* equal contribution)
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework for vector-valued manifold regularization and multi-view learning, International Conference on Machine Learning (ICML), 2013.

Social Interaction Analysis

- L. Bazzani*, M. Zanotto*, M. Cristani, V. Murino, Joint individual-group modeling for tracking. In IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2015. (* equal contribution)
- L. Bazzani, D. Tosato, M. Cristani, M. Farenzena, G. Paggetti, G. Menegaz, V. Murino, Social interactions by visual focus of attention in a three-dimensional environment, *Expert Systems*, 2013.
- L. Bazzani, V. Murino, and M. Cristani, Decentralized particle filter for joint individual-group tracking, International Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
- L. Bazzani, M. Cristani, G. Pagetti, D. Tosato, G. Menegaz, V. Murino, Analyzing groups: a social signaling perspective, *Video Analytics for Business Intelligence*, 2012.
- M. Zanotto, L. Bazzani, M. Cristani, and V. Murino, Online bayesian non-parametrics for social group detection, In British Machine Vision Conference (BMVC), 2012.
- M. Cristani, L. Bazzani, G. Paggetti, A. Fossati, A. Del Bue, D. Tosato, G. Menegaz, V. Murino, Social interaction discovery by statistical analysis of F-formations, British Machine Vision Conference (BMVC), 2011.
- M. Cristani, G. Paggetti, A. Vinciarelli, L. Bazzani, G. Menegaz, V. Murino, Towards computational proxemics: Inferring social relations from interpersonal distances, International Conference on Social Computing (Social-Com), 2011.
- L. Bazzani, M. Cristani, and V. Murino, Collaborative particles filters for group tracking, International Conference on Image Processing (ICIP), 2010.
- M. Farenzena, A. Tavano, L. Bazzani, D. Tosato, G. Paggetti, G. Menegaz, V. Murino, and M. Cristani, Social interaction by visual focus of attention in a three-dimensional environment, Workshop on Pattern Recognition and Artificial Intelligence for Human Behavior Analysis (PRAI*HBA), 2009.
- M. Farenzena, M. Cristani, L. Bazzani, and V. Murino, Towards a subject-centered analysis for automated video surveillance, International Conference on Image Analysis and Processing (ICIAP), 2009.

Other

- G. Roffo, M. Cristani, L. Bazzani, H. Q. Minh, and V. Murino, Trusting Skype: Learning the way people chat for fast user recognition and verification, In IEEE Workshop in Decoding Subtle Cues from Social Interactions, 2013.
- S. Martelli, M. Cristani, L. Bazzani, D. Tosato, and V. Murino, Joining feature-based and similarity-based pattern description paradigms for object detection, In International Conference on Pattern Recognition (ICPR), 2012.
- M. Cristani, G. Roffo, C. Segalin, L. Bazzani, A. Vinciarelli, and V. Murino, Conversationally-inspired stylometric features for authorship attribution in instant messaging, In ACM Multimedia, 2012.
- L. Bazzani, M. Cristani, M. Bicego, and V. Murino, Online subjective feature selection for occlusion management in tracking applications, International Conference on Image Processing (ICIP), 2009.
- D. Bloisi, L. Bazzani, and V. Murino, A comparison of particle filter-based and Kalman filter-based approaches in multi-target tracking, IEEE International Workshop on Performance Evaluation of Tracking and Surveillance (PETS), 2009.
- U. Castellani, L. Bazzani, D. Tosato, V. Murino, C. Rambaldelli, C. Perlini, M. Atzori, M. Tansella, and P. Brambilla, A learning by example approach for MRI analysis of human brain in the context of mental health, Joint Annual Meeting ISMRM-ESMRMB, Berlin 2007.

SELECTED TALKS

- Dynamics Modeling and Learning for Video Content Analysis, University of Sherbrooke, 21 March 2014.
- Multi-view Learning for Object Recognition, Dartmouth College, 17 January 2014.
- Learning attentional policies for object tracking and recognition in video with deep networks, International Conference on Machine Learning (ICML), 2011 And University of British Columbia, 24 June 2010.
- Restricted Boltzmann Machines and Deep Networks for Unsupervised Learning, Italian Institute of Technology, 7 June 2011.
- Multi-armed Bandit Problem and Bayesian Optimization in Reinforcement Learning, University of Verona, 16 March 2011.
- Multi-target Tracking for Social Interactions Detection and its Extension to Multi-Camera Case, University of British Columbia, 10 June 2010.
- Gradient-free Methods for Stochastic Optimization, University of Verona, 22 May 2009.
- Techniques for the Analysis and the Classification of MRI Images for Searching Pathology with Application on Mental Health Field, University of Verona, 2007.

SKILLS

Programming Python (> 3 years), MATLAB (> 6 years), Lua/Torch7 (> 1 year). Some experience C/C++/Java.
Tools Linux, emacs, git, L^AT_EX, bash scripting.
Languages Italian, English

REVIEWING ACTIVITY AND OTHERS

Journals IEEE TPAMI, IJCV, IEEE Transactions on Multimedia, IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Systems, Man and Cybernetics - Part B, Pattern Analysis and Applications, Image and Vision Computing, Transactions on Information Forensics & Security, PLOS ONE, Neurocomputing.
Conferences CVPR 2016/2014, ICCV 2015, BMVC 2015/2012, IROS 2015, ICRA 2015, ECCV 2014, ICDL-EPIROB 2014, SocialCom 2012.
Workshops GROW 2015, VS-Re-ID 2014, Re-id 2012.
Chair/Editor GROW 2015 (webchair), CVIU special issue (guest editor).

REFERENCE LIST

- **Lorenzo Torresani**, Dartmouth College, Hanover, NH. Supervisor of the postdoc at Dartmouth College. lt@dartmouth.edu. Phone: +1 603 646 3048.

- **Vittorio Murino**, Istituto Italiano di Tecnologia, Genova, Italy. Advisor of the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia. vittorio.murino@iit.it. Phone: +39 010 71781 504.
- **Nando de Freitas**, University of Oxford, Oxford, UK. Supervisor during the intership at the University of British Columbia. nando@cs.ox.ac.uk. Phone: +44 186 561 0764.
- **Marco Cristani**, University of Verona, Verona, Italy. Collaboration during the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia. marco.cristani@univr.it. Phone: +39 045 802 7988.
- **Hugo Larochelle**, Université de Sherbrooke, Sherbrooke (QC), Canada. Collaboration for the attentional modeling project. hugo.larochelle@usherbrooke.ca. Phone: +1 819 821 8000.