Carlo Ciliberto

Curriculum Vitae

▬▬▬ Education

2012–Present	**Postdoctoral Fellow**, *Massachusetts Institute of Technology*, Cambridge, MA, USA, Poggio Lab. Developing algorithms and theory for structure learning
2012–Present	**Postdoctoral Fellow**, *Istituto Italiano di Tecnologia*, Genova, Italy, Laboratory for Computational and Statistical Learning. Developing algorithms and applications for structure learning and visual recognition in Robotics
2009–2012	**PhD student in Robotics and Computer Vision**, *Istituto Italiano di Tecnologia*, Genova, Italy, PhD Thesis: *Self-supervised Robots: A path towards Autonomous Learning*.
2006–2008	**Master student in Mathematics**, *Universita' Roma Tre*, Rome, Italy, Master Thesis - Algebraic Geometry: *The Jacobian ideal of a Hypersurface*. 110/110 cum laude
2004–2006	**Bachelor student in Mathematics**, *Universita' Roma Tre*, Rome, ITaly, 110/110 cum laude.

▬▬▬ Experience

Teaching Experience

2015	**Teaching Graduated Topics in Machine Learning**, *MIT 9.520 - Statistical Learning Theory, Graduate Class at the Massachusetts Institute Technology - Fall semester*, Two Monographic lectures on Functional analysis and Multi-task learning, Course website: http://www.mit.edu/ 9.520/fall15/.
2015	**Robotics & Machine Learning Teaching Assistant at the CBMM Summer School**, *Summer school organized by the Center For Brain Mind and Machines (NSF founded project) at the Marine Biological Laboratory in Woods Hole, MA, USA*, Tutorials on Robotics. Supervising students for final projects. Supervising students for laboratories on machine learning, School website: http://cbmm.mit.edu/summer-school/2014.
2014	**Teaching Graduated Topics in Machine Learning**, *MIT 9.520 - Statistical Learning Theory, Graduate Class at the Massachusetts Institute Technology - Fall semester*, Two Monographic Lectures on Functional Analysis and Manifold Learning, Course website: http://www.mit.edu/ 9.520/fall14/.

2014	**Machine Learning Teaching Assistant at the CBMM Summer School**, *Summer school organized by the Center For Brain Mind and Machines (NSF founded project) at the Marine Biological Laboratory in Woods Hole, MA, USA*, Supervising students for laboratories on machine learning, School website: http://cbmm.mit.edu/summer-school/2014.

International Projects

2013–Present	**Center for Brains Minds and Machines**, *NSF Founded Project (USA)*, Developing theory and algorithms for Transfer and Multi-task Learning. Assisting in the organization of summer schools.
2009–2010	**Poeticon**, *European Project*, Involved in the *Poeticon* FP7 European project for Semantic Learning in Robotics, Developed the demonstration for the final review meeting of the project.
2009–2011	**CHRIS**, *European Project*, Involved in the *CHRIS* FP7 European project for Human Robot Interaction, Developed part of the demonstration for the final review meeting of the project.

Organization of Scientific Events

2015	**Workshop: Robotics Afternoon at MBL**, *Workshop on Robotics with talks by leaders of the research in the field*, Organization of the Workshop, Website of the event: `http://lcsl.mit.edu/courses/cbmmss/robotics/`.
2015	**Machine Learning Crash Course (MLCC)**, *One-week course on Machine Learning. Taught by Prof. Lorenzo Rosasco and Francesca Odone*, Organization of the course, Website of the event: http://lcsl.mit.edu/courses/mlcc/mlcc2015/.

Summer Schools

2010	**MLSS 2010 - Summer School on Cognitive Science and Machine Learning.**, *Co-organized by Pascal2, University College London, Cambridge University, UC Berkeley, Manchester University, Max Planck Institute for Biological Cybernetics, and MIT.*, Pula, Italy.
2009	**Robot Learning Summer School**, *Summer school on Machine Learning applications to Robotics*, Istituto de Sistemas e Robotica (ISR), Lisbon, Portugal.

Expertise

Machine Learning

Advanced	Statistical Learning Theory, Machine Learning in Reproducing Kernel Hilbert Spaces
Advanced	Kernel methods for Supervised learning: RLS, SVM, Boosting, Logistic Regression
Advanced	Unsupervised Learning: K-means, LDA, KPCA, spectral clustering
Intermediate	Feature selection: LASSO, Group Lasso, Structured sparsity

Optimization

Advanced	Smooth convex optimization (first/second order methods)
Advanced	Proximal Algorithms for non-smooth optimization
Intermediate	Stochastic optimization
Intermediate	Interior Point methods

Computer Vision

Advanced	Feature Learning and Feature Extraction
Advanced	Object Learning and Recognition
Intermediate	Tracking

Robotics

Advanced	Multi-sensory integration of visual, haptic and kinematic data
Advanced	Independent Motion Detection for actuated visual sensors
Intermediate	Kinematics and Dynamics
Basic	Control Theory

Mathematics

Advanced	Linear Algebra, Topology
Intermediate	Functional Analysis, Statistics, Differential Geometry
Basic	Algebraic Geometry

Computer skills

Advanced	C++, MATLAB
Intermediate	PYTHON, JAVASCRIPT (and NODE.JS), HTML & CSS, JAVA, LATEX
Basic	JULIA, Adobe Suite

Languages

Italian	**Mothertongue**
English	**Fluent**

Publications

2015 **Convex Learning of Multiple Tasks and their Structure** , *Carlo Ciliberto, Youssef Mroueh, Tomaso Poggio, Lorenzo Rosasco*, International Conference on Machine Learning (ICML), 2015.

2015 **Learning Multiple Visual Tasks while Discovering their Structure** , *Carlo Ciliberto, Lorenzo Rosasco, Silvia Villa*, Computer Vision and Pattern Recognition (CVPR), 2015 IEEE Conference on.

2015 **Characterizing the Input-Output Function of the Olfactory-Limbic Pathway in the Guinea Pig** , *Gian Luca Breschi*, Carlo Ciliberto*, Thierry Nieus, Lorenzo Rosasco, Stefano Taverna, Michela Chiappalone, Valentina Pasquale*, Computational intelligence and neuroscience, ∗ = equal contribution.

2014 **Exploiting global force torque measurements for local compliance estimation in tactile arrays**, *Carlo Ciliberto, Luca Fiorio, Marco Maggiali, Lorenzo Natale, Lorenzo Rosasco, Giorgio Metta, Giulio Sandini, Francesco Nori*, Intelligent Robots and Systems (IROS 2014), 2014 IEEE/RSJ International Conference on.

2014 **Ask the image: supervised pooling to preserve feature locality**, *Sean Ryan Fanello, Nicoletta Noceti, Carlo Ciliberto, Giorgio Metta, Francesca Odone*, Computer Vision and Pattern Recognition (CVPR), 2014 IEEE Conference on.

2013 **On the impact of learning hierarchical representations for visual recognition in robotics**, *Carlo Ciliberto, Sean Ryan Fanello, Matteo Santoro, Lorenzo Natale, Giorgio Metta, Lorenzo Rosasco*, Intelligent Robots and Systems (IROS), 2013 IEEE/RSJ International Conference on.

2013 **Weakly supervised strategies for natural object recognition in robotics**, *Sean Ryan Fanello, Carlo Ciliberto, Lorenzo Natale, Giorgio Metta*, Robotics and Automation (ICRA), 2013 IEEE International Conference on.

2012 **A heteroscedastic approach to independent motion detection for actuated visual sensors**, *Carlo Ciliberto, Sean Ryan Fanello, Lorenzo Natale, Giorgio Metta*, Intelligent Robots and Systems (IROS), 2012 IEEE/RSJ International Conference on.

2011 **Online multiple instance learning applied to hand detection in a humanoid robot**, *Carlo Ciliberto, Fabrizio Smeraldi, Lorenzo Natale, Giorgio Metta*, ntelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on.

2011 **Reexamining lucas-kanade method for real-time independent motion detection: Application to the icub humanoid robot**, *Carlo Ciliberto, Ugo Pattacini, Lorenzo Natale, Francesco Nori, Giorgio Metta*, Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on.