

Francesco Orabona

Assistant Professor at Stony Brook University

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Curriculum Vitae

Francesco Orabona is an Assistant Professor at Stony Brook University. He received his PhD in Electronic Engineering from the University of Genoa, Italy, in 2007. His main research interests are theory and applications of machine learning and online learning algorithms.

As a result of his activities, Dr. Orabona has published more than 50 papers in scientific journals and conferences. His works are equally distributed between practical and theoretical works.

Journal Papers	12	Published between 2007 and 2017
Conference Papers	43	Published between 2005 and 2017
H-index	24	Source: Google Scholar (20 May 2017)
Citations	1587	Source: Google Scholar (20 May 2017)
Best paper awards	2	At international conferences

Employment

- 9/'16–present **Stony Brook University**, (NY, USA), Assistant Professor.
- 10/'14–8/'16 **Yahoo Labs**, (New York, NY, USA), Senior Research Scientist.
- 10/'11–9/'14 **Toyota Technological Institute**, (Chicago, IL, USA), Research Assistant Professor.
- 1/'10–9/'11 **University of Milan**, (Milan, Italy), Postdoctoral Researcher.
Supervisor: Prof. N. Cesa-Bianchi
- 4/'07–12/'09 **Idiap Research Institute**, (Martigny, Switzerland), Postdoctoral Researcher.
Supervisor: Prof. B. Caputo
- 1/'04–3/'07 **University of Genoa**, (Genoa, Italy), PhD Student.
Supervisors: Prof. G. Sandini and Prof. G. Metta

Education

- Apr 2007 **University of Genoa**, (Genoa, Italy), PhD in Electrical Engineering.
Dissertation: “Learning and Adaptation in Computer Vision”, Supervisor: Prof. G. Sandini
- Jul 2003 **University of Naples “Federico II”**, (Naples, Italy), Laurea Degree (BS+MS), 110/110
“magna cum laude” in Electrical Engineering.

Grants and Awards

- Feb 2017 **Google Research Award** on “Parameter-free Stochastic Minimization of Non-convex Functions”
- Sept 2015 **Best Paper Award** in the International Conference on Image Analysis and Processing
- 2014 **Italian Habilitation as Associate Professor** for the sector of Computer Science
- 2008, 2009 **Ranked first** in the ImageCLEF Medical Annotation Task (www.imageclef.org)
- June 2005 **Best Paper Award** in 3rd International Workshop on Attention and Performance in Computational Vision (in CVPR 2005)
- 1992 **1st** in the “LEGO World Cup”
- 1991 **1st** in the “Mathesis” mathematical contest in Naples

Publications (* denotes alphabetical ordering of the authors)

Peer Reviewed Journals

- [J12] I. Kuzborskij, F. Orabona, and B. Caputo. “Scalable Greedy Algorithms for Transfer Learning”. In: *Computer Vision and Image Understanding* 156 (2017), pp. 174–185
- [J11] I. Kuzborskij and F. Orabona. “Fast Rates by Transferring from Auxiliary Hypotheses”. In: *Machine Learning* 106 (2 2016), pp. 171–195
- [J10] F. Orabona, K. Crammer, and N. Cesa-Bianchi. “A generalized online mirror descent with applications to classification and regression”. In: *Machine Learning* 99 (3 June 2015), pp. 411–435
- * [J9] C. Gentile and F. Orabona. “On Multilabel Classification and Ranking with Bandit Feedback”. In: *Journal of Machine Learning Research* 15 (July 2014), pp. 2451–2487
- [J8] T. Tommasi, F. Orabona, and B. Caputo. “Learning Categories from Few Examples with Multi Model Knowledge Transfer”. In: *IEEE Trans. on Pattern Analysis and Machine Intelligence* 36.5 (2014), pp. 928–941
- [J7] T. Tommasi, F. Orabona, C. Castellini, and B. Caputo. “Improving Control of Dexterous Hand Prostheses Using Adaptive Learning”. In: *IEEE Trans. on Robotics* 29.1 (2013), pp. 207–219
- [J6] F. Orabona, L. Jie, and B. Caputo. “Multi Kernel Learning with Online-Batch Optimization”. In: *Journal of Machine Learning Research* 13 (2012), pp. 227–253
- [J5] F. Orabona, C. Castellini, B. Caputo, L. Jie, and G. Sandini. “On-line Independent Support Vector Machines”. In: *Pattern Recognition* 43.4 (2010), pp. 1402–1412
- [J4] E. Grossmann, J. A. Gaspar, and F. Orabona. “Discrete camera calibration from pixel streams”. In: *Computer Vision and Image Understanding* 114.2 (2010). Special issue on Omnidirectional Vision, Camera Networks and Non-conventional Cameras, pp. 198–209
- [J3] F. Orabona, J. Keshet, and B. Caputo. “Bounded Kernel-Based Online Learning”. In: *Journal of Machine Learning Research* 10 (2009), pp. 2571–2594
- [J2] T. Tommasi, F. Orabona, and B. Caputo. “Discriminative Cue Integration for Medical Image Annotation”. In: *Pattern Recognition Letters* 19.15 (2008), pp. 1996–2002 (**Winner of the Medical automatic annotation task ImageCLEF 2008**)
- [J1] C. Castellini, F. Orabona, G. Metta, and G. Sandini. “Internal models of reaching and grasping”. In: *Advanced Robotics* 21.13 (2007), pp. 1545–1564

Book Chapters

- [B5] T. Tatiana and F. Orabona. “Idiap on Medical Image Classification”. In: *ImageCLEF*. ed. by W. B. Croft, H. Müller, P. Clough, T. Deselaers, and B. Caputo. Vol. 32. The Information Retrieval Series. Berlin/Heidelberg: Springer, 2010, pp. 455–467
- [B4] T. Tommasi, F. Orabona, and B. Caputo. “An SVM Confidence-Based Approach to Medical Image Annotation”. In: *Evaluating Systems for Multilingual and Multimodal Information Access*. Ed. by C. Peters, T. Deselaers, N. Ferro, J. Gonzalo, G.J.F. Jones, M. Kurimo, T. Mandl, A. Peñas, and V. Petras. Vol. 5706. Lecture Notes in Computer Science. Berlin/Heidelberg: Springer, 2009, pp. 696–703 (**Winner of the Medical automatic annotation task ImageCLEF 2009**)
- [B3] T. Tommasi, F. Orabona, and B. Caputo. “Cue Integration for Medical Image Annotation”. In: *Advances in Multilingual and Multimodal Information Retrieval*. Ed. by C. Peters, V. Jijkoun, T. Mandl, H. Müller, D.W. Oard, A. Peñas, V. Petras, and D. Santos. Vol. 5152. Lecture Notes in Computer Science. Berlin/Heidelberg: Springer, 2008, pp. 577–584
- [B2] F. Orabona, G. Metta, and G. Sandini. “A Proto-Object Based Visual Attention Model”. In: *Attention in Cognitive Systems*. Ed. by L. Paletta and E. Rome. Vol. 4840. Lecture Notes in Artificial Intelligence. Berlin/Heidelberg: Springer, 2007, pp. 198–215
- [B1] L. Natale, F. Orabona, G. Metta, and G. Sandini. “Sensorimotor coordination in a “baby” robot: learning about objects through grasping”. In: *Progress in Brain Research, From Action to Cognition*. Ed. by C. von Hofsten and K. Rosander. Vol. 164. Elsevier, 2007

Peer Reviewed Conferences and Workshops

- * [C43] A. Beygelzimer, F. Orabona, and C. Zhang. “Efficient Online Bandit Multiclass Learning with $\tilde{O}(\sqrt{T})$ Regret”. In: *Proc. of the 34th International Conference on Machine Learning, ICML, Sydney, Australia, 6-11 August 2017*. JMLR Proceedings. JMLR.org, 2017
- [C42] K.-S. Jun, F. Orabona, R. Willett, and S. Wright. “Improved Strongly Adaptive Online Learning using Coin Betting”. In: *Proc. of the 20th International Conference on Artificial Intelligence and Statistics*,

AISTATS. 2017

- * [C41] F. Orabona and D. Pal. “Coin Betting and Parameter-Free Online Learning”. In: *Advances in Neural Information Processing Systems 29, NIPS*. 2016
- * [C40] F. Orabona and D. Pal. “Parameter-Free Convex Learning through Coin Betting”. In: *Proceedings of the 2016 Workshop on Automatic Machine Learning*. 2016, pp. 75–82
- [C39] A. Gonen, F. Orabona, and S. Shalev-Shwartz. “Solving Ridge Regression using Sketched Preconditioned SVRG”. in: *Proc. of the 33th International Conference on Machine Learning, ICML, New York, NY, USA, 19-24 June 2016*. JMLR Proceedings. JMLR.org, 2016
- [C38] R. De Rosa, F. Orabona, and N. Cesa-Bianchi. “The ABACOC Algorithm: a Novel Approach for Nonparametric Classification of Data Streams”. In: *2015 IEEE International Conference on Data Mining, ICDM, Atlantic City, NJ, USA, November 14-17, 2015*. IEEE, 2015
- * [C37] F. Orabona and D. Pal. “Scale-Free Algorithms for Online Linear Optimization”. In: *Algorithmic Learning Theory - 26th International Conference, ALT, Banff, Canada, October 4-6, 2015. Proc.* Ed. by K. Chaudhuri and C. Gentile. Lecture Notes in Computer Science. Springer, 2015
- [C36] I. Kuzborskij, F. Orabona, and B. Caputo. “Transfer Learning through Greedy Subset Selection”. In: *Image Analysis and Processing - ICIAP - 18th International Conference, Genoa, Italy, September 7-11, 2015, Proceedings, Part I*. ed. by V. Murino and E. Puppo. Vol. 9279. Lecture Notes in Computer Science. Springer, 2015 (**Best Paper Award**)
- [C35] F. Orabona. “Simultaneous Model Selection and Optimization through Parameter-free Stochastic Learning”. In: *Advances in Neural Information Processing Systems 27, NIPS*. 2014
- * [C34] B. McMahan and F. Orabona. “Unconstrained Online Linear Learning in Hilbert Spaces: Minimax Algorithms and Normal Approximations”. In: *COLT*. ed. by Maria-Florina Balcan and Csaba Szepesvári. Vol. 35. JMLR Proceedings. JMLR.org, 2014, pp. 1020–1039
- [C33] F. Orabona, T. Hazan, A. D. Sarwate, and T. Jaakkola. “On Measure Concentration of Random Maximum A-Posteriori Perturbations”. In: *Proc. of the 31th International Conference on Machine Learning, ICML, Beijing, China, 21-26 June 2014*. Vol. 32. JMLR Proceedings. JMLR.org, 2014, pp. 432–440
- [C32] F. Orabona. “Dimension-free Exponentiated Gradient”. In: *Advances in Neural Information Processing Systems 26, NIPS*. ed. by C.J.C. Burges, L. Bottou, M. Welling, Z. Ghahramani, and K.Q. Weinberger. Curran Associates, Inc., 2013, pp. 1806–1814
- * [C31] S. Kpotufe and F. Orabona. “Regression-tree Tuning in a Streaming Setting”. In: *Advances in Neural Information Processing Systems 26, NIPS*. ed. by C.J.C. Burges, L. Bottou, M. Welling, Z. Ghahramani, and K.Q. Weinberger. Curran Associates, Inc., 2013, pp. 1788–1796
- [C30] M. Fornoni, B. Caputo, and F. Orabona. “Multiclass Latent Locally Linear Support Vector Machines”. In: *Asian Conference on Machine Learning, ACML, Canberra, ACT, Australia, November 13-15, 2013*. Ed. by C. S. Ong and T. B. Ho. Vol. 29. JMLR Proceedings. JMLR.org, 2013, pp. 229–244
- [C29] I. Kuzborskij and F. Orabona. “Stability and Hypothesis Transfer Learning”. In: *Proc. of the 30th International Conference on Machine Learning, ICML, Atlanta, GA, USA, 16-21 June 2013*. Vol. 28. JMLR Proceedings. JMLR.org, 2013, pp. 942–950
- [C28] I. Kuzborskij, F. Orabona, and B. Caputo. “From N to N+1: Multiclass Transfer Incremental Learning”. In: *2013 IEEE Conference on Computer Vision and Pattern Recognition, CVPR, Portland, OR, USA, June 23-28, 2013*. IEEE, 2013, pp. 3358–3365
- * [C27] C. Gentile and F. Orabona. “On Multilabel Classification and Ranking with Partial Feedback”. In: *Advances in Neural Information Processing Systems 25, NIPS*. ed. by F. Pereira, C.J.C. Burges, L. Bottou, and K.Q. Weinberger. Curran Associates, Inc., 2012, pp. 1151–1159
- [C26] T. Tommasi, F. Orabona, M. Kaboli, and B. Caputo. “Leveraging over prior knowledge for online learning of visual categories”. In: *British Machine Vision Conference, BMVC, Surrey, UK, September 3-7, 2012*. Ed. by R. Bowden, J. P. Collomosse, and K. Mikolajczyk. BMVA Press, 2012, pp. 1–11
- [C25] F. Orabona, N. Cesa-Bianchi, and C. Gentile. “Beyond Logarithmic Bounds in Online Learning”. In: *Proc. of the 15th International Conference on Artificial Intelligence and Statistics, AISTATS, La Palma, Canary Islands, April 21-23, 2012*. Ed. by N. D. Lawrence and M. Girolami. Vol. 22. JMLR Proceedings. JMLR.org, 2012, pp. 823–831
- [C24] F. Orabona and N. Cesa-Bianchi. “Better Algorithms for Selective Sampling”. In: *Proc. of the 28th International Conference on Machine Learning, ICML, Bellevue, Washington, USA, June 28 - July 2, 2011*. Ed. by L. Getoor and T. Scheffer. Omnipress, 2011, pp. 433–440
- [C23] F. Orabona and L. Jie. “Ultra-Fast Optimization Algorithm for Sparse Multi Kernel Learning”. In: *Proc. of the 28th International Conference on Machine Learning, ICML, Bellevue, Washington, USA, June*

- 28 - July 2, 2011. Ed. by L. Getoor and T. Scheffer. Omnipress, 2011, pp. 249–256
- [C22] F. Orabona and K. Crammer. “New Adaptive Algorithms for Online Classification”. In: *Advances in Neural Information Processing Systems 23, NIPS*. ed. by J. Lafferty, C. K. I. Williams, J. Shawe-Taylor, R.S. Zemel, and A. Culotta. 2010, pp. 1840–1848
 - * [C21] L. Jie and F. Orabona. “Learning from Candidate Labeling Sets”. In: *Advances in Neural Information Processing Systems 23, NIPS*. ed. by J. Lafferty, C. K. I. Williams, J. Shawe-Taylor, R.S. Zemel, and A. Culotta. 2010, pp. 1504–1512
 - [C20] F. Orabona, L. Jie, and B. Caputo. “Online-Batch Strongly Convex Multi Kernel Learning”. In: *The 23rd IEEE Conference on Computer Vision and Pattern Recognition, CVPR, San Francisco, CA, USA, 13-18 June 2010*. IEEE, 2010, pp. 787–794
 - [C19] T. Tommasi, F. Orabona, and B. Caputo. “Safety in Numbers: Learning Categories from Few Examples with Multi Model Knowledge Transfer”. In: *The 23rd IEEE Conference on Computer Vision and Pattern Recognition, CVPR, San Francisco, CA, USA, 13-18 June 2010*. IEEE, 2010, pp. 3081–3088
 - [C18] L. Jie, F. Orabona, M. Fornoni, B. Caputo, and N. Cesa-Bianchi. “OM-2: An Online Multi-class Multi-kernel Learning Algorithm”. In: *4th IEEE Online Learning for Computer Vision Workshop (in CVPR10)*. San Francisco, CA, USA: IEEE Computer Society, 2010, pp. 43–50
 - [C17] M. M. Ullah, F. Orabona, and B. Caputo. “You Live, You Learn, You Forget: Continuous Learning of Visual Places with a Forgetting Mechanism”. In: *IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS*. St. Louis, MO, USA: IEEE Press, 2009, pp. 3154–3161
 - [C16] L. Jie, F. Orabona, and B. Caputo. “An Online Framework for Learning Novel Concepts over Multiple Cues”. In: *Computer Vision - ACCV 2009, 9th Asian Conference on Computer Vision, Xi’an, China, September 23-27, 2009, Revised Selected Papers, Part I*. ed. by Hongbin Zha, Rin-ichiro Taniguchi, and Stephen J. Maybank. Vol. 5994. Lecture Notes in Computer Science. Berlin/Heidelberg: Springer, 2010
 - * [C15] N. Cesa-Bianchi, C. Gentile, and F. Orabona. “Robust Bounds for Classification via Selective Sampling”. In: *Proc. of the 26th Annual International Conference on Machine Learning, ICML, Montreal, Quebec, Canada, June 14-18, 2009*. Ed. by A. P. Danyluk, L. Bottou, and M. L. Littman. Vol. 382. ACM International Conference Proceeding Series. ACM, 2009, pp. 121–128
 - [C14] F. Orabona, B. Caputo, A. Fillbrandt, and F. W. Ohl. “A Theoretical Framework for Transfer of Knowledge Across Modalities in Artificial and Biological Systems”. In: *International Conference on Development and Learning, ICDL*. Kobe, Japan: IEEE Computer Society, 2009, pp. 1–7
 - [C13] F. Orabona, C. Castellini, B. Caputo, A. E. Fiorilla, and G. Sandini. “Model Adaptation with Least-Squares SVM for Adaptive Hand Prosthetics”. In: *International Conference on Robotics and Automation, ICRA*. Kobe, Japan: IEEE Press, 2009, pp. 439–445
 - [C12] T. Tommasi, F. Orabona, and B. Caputo. “CLEF2008 Image Annotation Task: an SVM Confidence-Based Approach”. In: *Working Notes of the 2008 CLEF Workshop*. 2008
 - [C11] E. Grossmann, J. A. Gaspar, and F. Orabona. “Calibration from statistical properties of the visual world”. In: *Proc. of European Conference on Computer Vision, ECCV*. Marseille, France: Springer-Verlag, 2008, pp. 228–241
 - [C10] F. Orabona, J. Keshet, and B. Caputo. “The Projectron: a Bounded Kernel-Based Perceptron”. In: *Machine Learning, Proc. of the Twenty-Fifth International Conference ICML, Helsinki, Finland, June 5-9, 2008*. Ed. by W. W. Cohen, A. McCallum, and S. T. Roweis. Vol. 307. ACM International Conference Proceeding Series. ACM, 2008, pp. 720–727
 - * [C9] J. Anemueller, J-H. Bach, B. Caputo, L. Jie, F. Ohl, F. Orabona, R. Vogel, D. Weinshall, and A. Zweig. “Biologically Motivated Audio-Visual Cue Integration for Object Categorization”. In: *Proc. of International Conference on Cognitive Systems*. University of Karlsruhe, Germany, 2008
 - [C8] E. Grossmann, F. Orabona, and J.A. Gaspar. “Discrete camera calibration from the information distance between pixel streams”. In: *Proc. of 7th Workshop on Omnidirectional Vision (in ICCV07)*. Rio de Janeiro, Brazil, 2007, pp. 1–8
 - [C7] F. Orabona, C. Castellini, B. Caputo, J. Luo, and G. Sandini. “Indoor Place Recognition using Online Independent Support Vector Machines”. In: *Proc. of the British Machine Vision Conference, BMVC*. ed. by N. M. Rajpoot and A. Bhalerao. University of Warwick, UK: BMVA, 2007, pp. 1090–1099
 - [C6] T. Tommasi, F. Orabona, and B. Caputo. “CLEF2007 Image Annotation Task: an SVM-based Cue Integration Approach”. In: *In Working Notes of the 2007 CLEF Workshop*. Budapest, Hungary, 2007
 - [C5] M. Vurro, G. Baselli, F. Orabona, and G. Sandini. “Simulation and Assessment of Bioinspired Visual Processing System for Epi-retinal Prostheses”. In: *28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*. New York City, USA, 2006

- [C4] F. Orabona, G. Metta, and G. Sandini. “Learning Association Fields from Natural Images”. In: *Proc. of the Conference on Computer Vision and Pattern Recognition – Workshop*. Washington, DC, USA: IEEE Computer Society, 2006
- [C3] L. Natale, F. Orabona, F. Berton, G. Metta, and G. Sandini. “From sensorimotor development to object perception”. In: *Proc. of the 5th IEEE-RAS International Conference on Humanoid Robots, Humanoids*. 2005, pp. 226–231
- [C2] L. Natale, F. Orabona, G. Metta, and G. Sandini. “Exploring the world through grasping: a developmental approach”. In: *Proc. of the 6th IEEE International Symposium on Computational Intelligence in Robotics and Automation, CIRA*. 2005, pp. 559–565
- [C1] F. Orabona, G. Metta, and G. Sandini. “Object-based Visual Attention: a Model for a Behaving Robot”. In: *Proc. of the Conference on Computer Vision and Pattern Recognition – Workshops*. Washington, DC, USA: IEEE Computer Society, 2005 (**Best Paper Award**)

Others

- * [T7] F. Orabona and T. Tommasi. *Backprop without Learning Rates Through Coin Betting*. 2017. arXiv: 1705.07795 [cs.LG]
- [T6] T. Hazan, F. Orabona, A. D. Sarwate, S. Maji, and T. Jaakkola. *High Dimensional Inference with Random Maximum A-Posteriori Perturbations*. Under review. 2016. arXiv: 1602.03571 [cs.LG]
- * [T5] F. Orabona and D. Pal. *Scale-Free Online Learning*. Under review. 2016. arXiv: 1601.01974 [cs.LG]
- * [T4] F. Orabona and D. Pal. *Optimal Non-Asymptotic Lower Bound on the Minimax Regret of Learning with Expert Advice*. 2015. arXiv: 1511.02176 [stat.ML]
- [T3] F. Orabona. *A Simple Expression for Mill’s Ratio of the Student’s t-Distribution*. 2015. arXiv: 1502.01632 [cs.LG]
- [T2] F. Orabona, A. Argyriou, and N. Srebro. *PRISMA: PROximal Iterative SMOOTHing Algorithm*. 2012. arXiv: 1206.2372 [math.OA]
- [T1] F. Orabona. *DOGMA: a MATLAB toolbox for Online Learning*. Software available at <http://dogma.sourceforge.net>. 2009

Service to the Community and Scientific Activities

- Tutorials:
 - *Tutorial on Domain Adaptation and Transfer Learning*. Co-organizer, ECCV’14.
- Organizer of workshops:
 - *3rd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* Co-organizer, ECCV’16.
 - *2nd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* Co-organizer, ICCV’15.
 - *Transfer and Multi-task learning: Theory Meets Practice*. Co-organizer, NIPS’14.
 - *1st TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision*. Co-organizer, ECCV’14.
 - *New Directions in Transfer and Multi-Task: Learning Across Domains and Tasks*. Co-organizer, NIPS’13.
 - *Learning from Multiple Sources with Applications to Robotics*. Co-organizer, NIPS’09.
- Editor:
 - Co-Guest editor of the Journal of Machine Learning Research Special Topic on Multi Task Learning, Domain Adaptation and Transfer Learning.
- Member of the Program Committee
 - Conference On Learning Theory (COLT) 2017
 - Neural Information Processing Systems (NIPS) 2016, 2017
 - Artificial Intelligence and Statistics (AISTATS) 2016, 2017
 - Algorithmic Learning Theory (ALT) 2015
- Reviewer
 - Several major journals, including: Journal of Machine Learning Research, Machine Learning Journal, Neural Networks, Neural Computation, Neurocomputing, Pattern Recognition, Image and Vision Computing, IEEE Trans. on Neural Networks, IEEE Trans. on Information Theory.
 - International Conferences: AISTATS 2011-2012; ECML 2012; ICML 2011-2015; NIPS 2008-2013,2015; COLT 2010-2016; ALT 2009,2012; ICRA 2010-2012; ICDL 2007-2008
- Referee Expert for the Israel Science Foundation.