

# Francesco Orabona

Associate Professor at KAUST

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## Curriculum Vitae

Francesco Orabona is an Associate Professor at King Abdullah University of Science and Technology, Saudi Arabia. He received his PhD in “Bioengineering, Materials Engineering, and Robotics” 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 80 papers in scientific journals, conferences, and book chapters. His work explores both practical and theoretical aspects.

Journal Papers	17	Published between 2007 and 2023
Conference and Workshop Papers	66	Published between 2005 and 2023
H-index	37	Source: Google Scholar (6 Aug 2023)
Citations	4863	Source: Google Scholar (6 Aug 2023)

## Affiliations

- 7/23–Present **KAUST**, (SA), Associate Professor in the CEMSE division.
- 9/22–6/23 **Boston University**, (MA, USA), Secondary affiliation with the Faculty of Computing & Data Sciences.
- 5/21–6/23 **Boston University**, (MA, USA), Associate Professor in the Department of ECE.
- 2/20–8/22 **Boston University**, (MA, USA), Founding Faculty Member of the Faculty of Computing & Data Sciences.
- 9/19–present **Boston University**, (MA, USA), Secondary affiliation with the Division of Systems Engineering.
- 9/18–present **Boston University**, (MA, USA), Courtesy affiliation with the CS Department.
- 9/18–present **Boston University**, (MA, USA), Data Science Faculty Fellow.
- 9/18–5/21 **Boston University**, (MA, USA), Assistant Professor in the Department of ECE.
- 9/16–8/18 **Stony Brook University**, (NY, USA), Assistant Professor in the CS Department.
- 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.
- 2/11–4/11 **Technion**, (Haifa, Israel), Visiting Researcher.
- 1/10–9/11 **University of Milan**, (Milan, Italy), Postdoctoral Researcher.
- 4/07–12/09 **Idiap Research Institute**, (Martigny, Switzerland), Postdoctoral Researcher.
- 3/06–4/06 **Helsinki University of Technology**, (Helsinki, Finland), Visiting Researcher.
- 1/04–3/07 **University of Genoa**, (Italy), Research Assistant.

## Education

- Apr 2007 **University of Genoa**, (Italy), PhD in “Bioengineering, Materials Engineering, and Robotics”.
- Jul 2003 **University of Naples “Federico II”**, (Italy), Laurea Degree (BS+MS) in Electrical Engineering, 110/110 “magna cum laude”.

## Awards

- Feb 2021 **NSF CAREER Award**
- Dec 2017 **Bell Labs Prize Finalist**, 9 out of more than 350 hundred proposals
- Feb 2017 **Google Research Award**

- Sept 2015 **Best Paper Award** in the International Conference on Image Analysis and Processing
- 2008 & 2009 **Ranked first** in the ImageCLEF Medical Annotation Task ([www.imageclef.org](http://www.imageclef.org))
- June 2005 **Best Paper Award** in International Workshop on Attention and Performance in Computational Vision (in CVPR 2005)
- 1992 **Ranked first** in the “LEGO World Cup”

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## Research Funding

- 2021-2026 **NSF, CAREER**: “Parameter-free Optimization Algorithms for Machine Learning”, PI, Total \$583,898.
- 2020-2025 **NSF (TRIPODS)**, Collaborative Research: “Foundations of Data Science Institute”, PI, Total \$15M, BU \$346,540.
- 2019-2022 **NSF**, Collaborative Research: “New Representations for Learning Algorithms and Secure Computation”, Co-PI, Total \$400,000, BU \$199,994.
- 2018-2020 **NSF (TRIPODS)**, Collaborative Research: “TRIPODS Institute for Optimization and Learning”, PI, Total \$1,484,152, BU \$288,482.
- 2017-2018 **Google Research Award**, “Parameter-free Stochastic Minimization of Non-convex Functions”, PI, Total \$41,500.

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## Publications (\* denotes alphabetical ordering of the authors)

### Peer Reviewed Journals

- [J17] Z. Zhuang, M. Liu, A. Cutkosky, and F. Orabona. “Understanding AdamW through Proximal Methods and Scale-Freeness”. In: *Transactions on Machine Learning Research* (2022). URL: <https://openreview.net/forum?id=IKhEPWGdwK>
- \* [J16] N. Cesa-Bianchi and F. Orabona. “Online Learning Algorithms”. In: *Annual Review of Statistics and Its Application* 8 (2021)
- [J15] T. Hazan, F. Orabona, A. D. Sarwate, S. Maji, and T. S. Jaakkola. “High Dimensional Inference with Random Maximum A-Posteriori Perturbations”. In: *IEEE Trans. Information Theory* 65.10 (2019), pp. 6539–6560
- \* [J14] F. Orabona and D. Pál. “Scale-free online learning”. In: *Theoretical Computer Science* 716 (2018). Special Issue on ALT 2015, pp. 50–69
- [J13] K.-S. Jun, F. Orabona, S. Wright, and R. Willett. “Online Learning for Changing Environments Using Coin Betting”. In: *Electron. J. Statist.* 11.2 (2017), pp. 5282–5310
- [J12] I. Kuzborskij, F. Orabona, and B. Caputo. “Scalable Greedy Algorithms for Transfer Learning”. In: *Computer Vision and Image Understanding* 156 (Mar. 2017), pp. 174–185
- [J11] I. Kuzborskij and F. Orabona. “Fast Rates by Transferring from Auxiliary Hypotheses”. In: *Machine Learning* 106 (2 2017), 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 (May 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 (Feb. 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*. 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*. 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*. 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*. 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*. Vol. 164. Elsevier, 2007

### Peer Reviewed Conferences and Workshops

- \* [C66] K. Jang, K.-S. Jun, I. Kuzborskij, and F. Orabona. “Improved Time-Uniform PAC-Bayes Bounds using Coin-Betting”. In: *ICML workshop on PAC-Bayes Meets Interactive Learning*. 2023
- [C65] K. Chen, and F. Orabona. “Implicit Interpretation of Importance Weight Aware Updates”. In: *ICML Workshop on Duality Principles for Modern Machine Learning*. 2023
- \* [C64] A. Cutkosky, H. Mehta, and F. Orabona. “Optimal Stochastic Non-smooth Non-convex Optimization through Online-to-Non-convex Conversion”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 2023
- [C63] K. Chen, and F. Orabona. “Generalized Implicit Follow-The-Regularized-Leader”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 2023
- \* [C62] K. Jang, K.-S. Jun, I. Kuzborskij, and F. Orabona. “Tighter PAC-Bayes Bounds Through Coin-Betting”. In: *Proc. of the Annual Conference on Learning Theory (COLT)*. 2023
- \* [C61] M. Crawshaw, M. Liu, F. Orabona, W. Zhang, and Z. Zhuang. “Robustness to Unbounded Smoothness of Generalized SignSGD”. in: *Advances in Neural Information Processing Systems*. 2022
- [C60] K. Chen, A. Cutkosky, and F. Orabona. “Implicit Parameter-free Online Learning with Truncated Linear Models”. In: *Proc. of the International Conference on Algorithmic Learning Theory (ALT)*. 2022
- [C59] X. Li, M. Liu, and F. Orabona. “On the Last Iterate Convergence of Momentum Methods”. In: *Proc. of the International Conference on Algorithmic Learning Theory (ALT)*. 2022
- [C58] M. Liu and F. Orabona. “On the Initialization for Convex-Concave Min-max Problems”. In: *Proc. of the International Conference on Algorithmic Learning Theory (ALT)*. 2022
- [C57] K. Chen, J. Langford, and F. Orabona. “Better Parameter-free Stochastic Optimization with ODE Updates for Coin-Betting”. In: *Proc. of the AAAI Conference on Artificial Intelligence (AAAI)*. 2022
- [C56] J. Negrea, B. Bilodeau, N. Campolongo, F. Orabona, and D. M. Roy. “Minimax Optimal Quantile and Semi-Adversarial Regret via Root-Logarithmic Regularizers”. In: *Advances in Neural Information Processing Systems*. 2021
- [C55] G. Flaspohler, F. Orabona, J. Cohen, S. Mouatadid, M. Oprescu, P. Orenstein, and L. Mackey. “Online Learning with Optimism and Delay”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 2021
- [C54] X. Li, Z. Zhuang, and F. Orabona. “A Second look at Exponential and Cosine Step Sizes: Simplicity, Convergence, and Performance”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 2021
- [C53] N. Campolongo and F. Orabona. “Temporal Variability in Implicit Online Learning”. In: *Advances in Neural Information Processing Systems*. Ed. by H. Larochelle, M. Ranzato, R. Hadsell, M. F. Balcan, and

- H. Lin. Vol. 33. Curran Associates, Inc., 2020, pp. 12377–12387
- [C52] X. Li and F. Orabona. “A High Probability Analysis of Adaptive SGD with Momentum”. In: *ICML Workshop on Beyond First Order Methods in ML Systems*. 2020
  - [C51] K.-S. Jun, A. Cutkosky, and F. Orabona. “Kernel Truncated Randomized Ridge Regression: Optimal Rates and Low Noise Acceleration”. In: *Advances in Neural Information Processing Systems 32*. 2019
  - \* [C50] A. Cutkosky and F. Orabona. “Momentum-Based Variance Reduction in Non-Convex SGD”. in: *Advances in Neural Information Processing Systems 32*. 2019
  - \* [C49] K.-S. Jun and F. Orabona. “Parameter-Free Locally Differentially Private Stochastic Subgradient Descent”. In: *NeurIPS Workshop on Privacy in Machine Learning*. 2019
  - [C48] Z. Zhuang, A. Cutkosky, and F. Orabona. “Surrogate Losses for Online Learning of Stepsizes in Stochastic Non-Convex Optimization”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 2019
  - \* [C47] K.-S. Jun and F. Orabona. “Parameter-free Online Convex Optimization with Sub-Exponential Noise”. In: *Proc. of the Annual Conference on Learning Theory (COLT)*. 2019
  - [C46] X. Li and F. Orabona. “On the Convergence of Stochastic Gradient Descent with Adaptive Stepsizes”. In: *Proc. of the International Conference on Artificial Intelligence and Statistics (AISTATS)*. 2019
  - \* [C45] A. Cutkosky and F. Orabona. “Black-Box Reductions for Parameter-free Online Learning in Banach Spaces”. In: *Proc. of the Annual Conference on Learning Theory (COLT)*. 2018
  - \* [C44] F. Orabona and T. Tommasi. “Training Deep Networks without Learning Rates Through Coin Betting”. In: *Advances in Neural Information Processing Systems 30*. 2017
  - \* [C43] A. Beygelzimer, F. Orabona, and C. Zhang. “Efficient Online Bandit Multiclass Learning with  $\tilde{O}(\sqrt{T})$  Regret”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 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 International Conference on Artificial Intelligence and Statistics (AISTATS)*. 2017
  - \* [C41] F. Orabona and D. Pál. “Coin Betting and Parameter-Free Online Learning”. In: *Advances in Neural Information Processing Systems 29*. 2016
  - \* [C40] F. Orabona and D. Pál. “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 International Conference on Machine Learning (ICML)*. 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: *Proc. of the IEEE International Conference on Data Mining (ICDM)*. IEEE, 2015
  - \* [C37] F. Orabona and D. Pál. “Scale-Free Algorithms for Online Linear Optimization”. In: *Proc. of the International Conference on Algorithmic Learning Theory (ALT)*. Lecture Notes in Computer Science. Springer, 2015
  - [C36] I. Kuzborskij, F. Orabona, and B. Caputo. “Transfer Learning through Greedy Subset Selection”. In: *Proc. of the International Conference on Image Analysis and Processing (ICIAP)*. 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*. 2014
  - \* [C34] B. McMahan and F. Orabona. “Unconstrained Online Linear Learning in Hilbert Spaces: Minimax Algorithms and Normal Approximations”. In: *Proc. of the Annual Conference on Learning Theory (COLT)*. 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 International Conference on Machine Learning (ICML)*. 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*. 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*. Curran Associates, Inc., 2013, pp. 1788–1796
  - [C30] M. Fornoni, B. Caputo, and F. Orabona. “Multiclass Latent Locally Linear Support Vector Machines”. In: *Proc. of the Asian Conference on Machine Learning (ACML)*. 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 International Conference on Machine Learning (ICML)*. 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: *Proc. of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. 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*. 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: *Proc. of the British Machine Vision Conference (BMVC)*. 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 International Conference on Artificial Intelligence and Statistics (AISTATS)*. 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 International Conference on Machine Learning (ICML)*. Omnipress, 2011, pp. 433–440
  - [C23] F. Orabona and L. Jie. “Ultra-Fast Optimization Algorithm for Sparse Multi Kernel Learning”. In: *Proc. of the International Conference on Machine Learning (ICML)*. 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*. 2010, pp. 1840–1848
  - \* [C21] L. Jie and F. Orabona. “Learning from Candidate Labeling Sets”. In: *Advances in Neural Information Processing Systems 23*. 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)*. 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)*. 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: *Proc. of the 4th IEEE Online Learning for Computer Vision Workshop (in CVPR’10)*. IEEE Computer Society, June 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*. 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*. 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 Annual International Conference on Machine Learning (ICML)*. 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: *Proc. of the International Conference on Development and Learning (ICDL)*. Washington, DC, USA: IEEE Computer Society, June 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: *Proc. of the International Conference on Robotics and Automation (ICRA)*. IEEE Press, May 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)*. Berlin/Heidelberg: Springer-Verlag, 2008, pp. 228–241
  - [C10] F. Orabona, J. Keshet, and B. Caputo. “The Projectron: a Bounded Kernel-Based Perceptron”. In: *Proc. of the International Conference on Machine Learning (ICML)*. vol. 307. ACM International Conference Proceeding Series. ACM, 2008, pp. 720–727
  - \* [C9] J. Anemuller, 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*. 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 ICCV’07)*. 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)*. 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*. 2007
  - [C5] M. Vurro, G. Baselli, F. Orabona, and G. Sandini. “Simulation and Assessment of Bioinspired Visual Processing System for Epi-retinal Prostheses”. In: *Proc. of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society*. 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 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 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

- [T6] F. Orabona and K.-S. Jun. *Tight Concentrations and Confidence Sequences from the Regret of Universal Portfolio*. 2021. arXiv: 2110.14099 [stat.ML]
- [T5] F. Orabona. *A Modern Introduction to Online Learning*. 2019. arXiv: 1912.13213 [cs.LG]
- \* [T4] F. Orabona and D. Pál. *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

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## Teaching activities

- Spring **Instructor**, *Boston University*, Boston, MA, USA.  
2023–2019 EC 503 Introduction to Learning from Data
- Fall 2019, **Instructor**, *Boston University*, Boston, MA, USA.  
2021–2022 EC 500 Introduction to Online Learning
- Fall 2020 **Instructor**, *Boston University*, Boston, MA, USA.  
EC 414 Introduction to Machine Learning
- Spring 2018 **Instructor**, *Stony Brook University*, Stony Brook, NY, USA.  
CSE 592 Convex Optimization
- Spring 2017 **Instructor**, *Stony Brook University*, Stony Brook, NY, USA.  
CSE 512 Machine Learning
- Fall 2013 **Instructor**, *Toyota Technological Institute and University of Chicago*, Chicago, USA.  
TTIC 31070 (CMSC 34500 Optimization/ BUSF 36903) Convex Optimization
- 2004, 2005 **Teaching assistant**, *University of Genoa*, Genoa, Italy.  
Course “Biomedical Informatics”, Prof. V. Tagliasco, Bachelor in Biomedical Engineering



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## Service to the Community and Scientific Activities

- Invited talks at international conferences, workshops and schools:
  - 2023, *Parameter-Free Online Convex Optimization: Past, Present, and Future*, Mini-symposium at SIAM Conference on Optimization
  - 2022, *Robustness to Unbounded Smoothness of Generalized SignSGD*, Mini-symposium at SIAM Conference on Mathematics of Data Science
  - 2020, *Parameter-free Stochastic Optimization through Coin Betting*, Minisymposium on Online Methods in Inverse Problems and Imaging at 2020 SIAM, Online, July 2020
  - 2019, *Parameter-free Machine Learning through Coin Betting*, Third International Conference on Econometrics and Statistics, National Chung Hsing University, Taiwan, June 2019
  - 2019, *Parameter-free Convex Stochastic Optimization through Coin Betting*, Third International Conference on Mathematics of Data Science, City University of Hong Kong, June 2019
  - 2019, *Coin Betting for Backprop without Learning Rates and More*, New England Machine Learning Day, Northeastern University, May 2019
  - 2019, *Parameter-free Machine Learning through Coin Betting*, Geometric Analysis Approach to AI Workshop, Harvard University, Jan 2019
  - 2016, *One Coin to Rule Them All: From Betting to Online Learning to Automatic Model Selection with One Algorithm*, Workshop on Theoretical Foundations for Learning from Easy Data, Lorentz Center, Netherlands, November 7-11.
  - 2015, *Simultaneous Model Selection and Learning through Parameter-free Stochastic Gradient Descent*, MOPTA 2015, Lehigh University, PA, July 20-22.
  - 2015, *Non IID Data in Advertising*, Machine Learning with Interdependent and Non-identically Distributed Data, Dagstuhl, Germany, April 7-10.
  - 2014, *Simultaneous Model Selection and Learning through Parameter-free Stochastic Gradient Descent*, FOCM Workshop on Learning Theory, Montevideo, Uruguay, December 18-20.
  - 2012, *Efficient and Principled Online Algorithms for Lifelong Learning.*, IROS Workshop on Lifelong Learning for Mobile Robotics Applications, Vilamoura, Portugal, Oct.
- Invited research seminars in universities/research centers:
  - 2023, *Two Birds with One Coin: Confidence Sequences and Convex Optimization with Coin-Betting*, Princeton
  - 2023, *Understanding Adam and AdamW through proximal updates, scale-freeness, and relaxed smoothness*, Microsoft Research Asia
  - 2022, *Better Optimization Algorithms for Machine Learning*, MBZUAI.
  - 2022, *Parameter-free Online Optimization: Past, Present, and Future*, KAUST.
  - 2022, *Two Birds with One Coin: Convex Optimization and Confidence Sequences with Coin-Betting*, Rutgers University.
  - 2021, *Parameter-free Stochastic Optimization of Variationally Coherent Functions*, University of Genova; University of Copenhagen; Purdue University; University of Pittsburgh.
  - 2021, *Parameter-free Machine Learning through Coin Betting*, Italian Institute of Technology; BMW AI Centre of Excellence.
  - 2019, *Parameter-free Machine Learning through Coin Betting*, MSR Cambridge; University of Milan.
  - 2018, *Parameter-free Machine Learning through Coin Betting*, Boston University; UMass Amherst; MSR NY; Yahoo.
  - 2017, *Coin Betting for Backprop without Learning Rates and More*, Google Research NY; Google Research Zurich; DeepMind; MSR Cambridge; UMass Amherst; IBM Thomas J. Watson Research Center.
  - 2017, *One Coin to Rule Them All: From Betting to Online Learning to Automatic Model Selection with One Algorithm*, SUNY Albany; Princeton.
  - 2016, *From 1 to 1,000,000 Samples: Theoretically Principled Machine Learning Algorithms for Real-World Applications*. Stony Brook University.
  - 2015, *One Coin to Rule Them All: from Adversarial Betting to Adaptive Stochastic Optimization*. Lehigh University.
  - 2015, *Simultaneous Model Selection and Learning through Parameter-free Stochastic Gradient Descent*. Wisconsin Institute for Discovery.
  - 2014, *From 1 to 1,000,000 Samples: Theoretically Principled Machine Learning Algorithms for Real-World Applications*. University of Copenhagen; Tulane University.

- 2014, *Efficient Learning through Online Algorithms*. Dartmouth College; Yahoo Labs New York.
- 2014, *Learning with Few Samples*. Toyota Technological Institute (Nagoya).
- 2013, *Adaptation in Online Learning through Dimension-free Exponentiated Gradient*. University of Rome; University of Illinois at Chicago; Columbia University; Microsoft Research New York.
- 2012, *Selective sampling and ranking in the partial adversarial setting*. German Aerospace Center (DLR); Max Planck Institute; Yahoo Labs Silicon Valley.
- 2012, *Efficient Stochastic and Batch Optimization Algorithms*. Katholieke Universiteit.
- 2011, *On the Beauty of Online Selective Sampling*. Idiap Research Institute.
- 2011, *Efficient and Principled Learning Algorithms for Real World Problems*. Toyota Technological Institute; MIT.
- 2011-2010, *Simple and Efficient Algorithms for Online and Stochastic Learning*. Technion; Centre de Visió per Computador.
- 2008, *Bounded (and not) Online Learning with Kernels*. Fondazione Bruno Kessler.
- Tutorials:
  - *Tutorial on Parameter-free Online Optimization*. Co-organizer, ICML'20.
  - *Tutorial on Domain Adaptation and Transfer Learning*. Co-organizer, ECCV'14.
- Organizer of workshops:
  - *Recent Advances in Machine Learning and Optimization* at the SIAM Conference on Mathematics of Data Science 2022.
  - *5rd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* at ECCV'18.
  - *4rd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* at ICCV'17.
  - *3rd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* at ECCV'16.
  - *2nd TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* at ICCV'15.
  - *Transfer and Multi-task learning: Theory Meets Practice* at NIPS'14.
  - *1st TASK-CV: Transferring and Adapting Source Knowledge in Computer Vision* at ECCV'14.
  - *New Directions in Transfer and Multi-Task: Learning Across Domains and Tasks* at NIPS'13.
  - *Learning from Multiple Sources with Applications to Robotics* at NIPS'09.
- Editor:
  - Action Editor: IEEE Trans. Information Theory, 2022-.
  - Action Editor: Journal of Machine Learning Research, 2020-.
  - Co-Guest editor of the Journal of Machine Learning Research Special Topic on Multi Task Learning, Domain Adaptation and Transfer Learning.
- Program Chair of Conferences
  - Algorithmic Learning Theory (ALT) 2023
- Member of the Program Committee
  - AAAI Conference on Artificial Intelligence (AAAI) 2020, 2024 Senior Area Chair
  - Conference On Learning Theory (COLT) 2017, 2019, 2021-2023 Area Chair
  - Neural Information Processing Systems 2016–2019, 2022 Area Chair; 2020, 2023 Senior Area Chair
  - International Conference on Machine Learning (ICML) 2019-2021, Area Chair
  - International Conference on Learning Representations (ICLR), 2021–2023, Area Chair
  - Artificial Intelligence and Statistics (AISTATS) 2016, 2017, 2019–2023, Area Chair
  - International Joint Conferences on Artificial Intelligence (IJCAI) 2019, Area Chair
  - Algorithmic Learning Theory (ALT) 2015, 2022, Senior PC member
- 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; NeurIPS 2008-2013,2015; COLT 2010-2016,2018; ALT 2009,2012; ICRA 2010-2012; ICDL 2007-2008; ICLR 2017; AAAI 2022
- Referee for NSF, and Israel Science Foundation

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## Advising

- Post Docs:
  - Mingrui Liu, 2020-2021, currently Assistant Prof. at George Mason University
  - Kwang-Sung Jun, 2018-2019, currently Assistant Prof. at University of Arizona



- PhD Students:
  - Keyi Chen, CS, 2018-
  - Zhenxun Zhuang, CS, 2018-2022, now Research Scientist at Meta
  - Xiaoyu Li, SE, 2018-2022, now Data Scientist at Microsoft
- MS Students:
  - Krishna Chaitanya Chakka, 2016