

Julien Mairal

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Date of birth: 19th January 1982
Civil status: married, 1 child

Education

2017 Habilitation diploma (HdR), *Université Grenoble-Alpes*, Grenoble, France.

Dissertation: Large-scale machine learning and applications.

2007–2010 PhD in applied mathematics, *Ecole Normale Supérieure*, Cachan, France.

Supervisors: *Pr. Jean Ponce and Dr. Francis Bach*.

Dissertation: Sparse coding for machine learning, image processing and computer vision.

2006–2007 M.S. in applied mathematics, *Ecole Normale Supérieure*, Cachan, France.

2005–2007 M.S. in electrical engineering, *Telecom ParisTech*, Paris.

2002–2005 B.S. in computer science, *Ecole Polytechnique*, Palaiseau, France.

Professional Experience

Since 2012 Inria, *Grenoble, France*, Research scientist (“détachement du corps des mines”).

2011–2012 University of California, *Berkeley*, Postdoctoral researcher.

Department of Statistics, working with Pr. Bin Yu.

2007–2010 Inria, *Paris*, PhD student.

2006 University of Minnesota, *Minneapolis*, Research internship, 7 months.

2005 Inria/ENPC, *Paris*, Research internship, 5 months.

Awards and Honors

2019 I received the ICML test of time award.

2017 I received the IEEE PAMI young researcher award.

2016 I was promoted Senior member of the IEEE society.

2013 Recipient of the Cor Baayen young researcher award, awarded by ERCIM each year to a “promising young researcher in computer science and applied mathematics”.

2011 Best PhD thesis prize from the foundation EADS (known today as foundation Airbus group) in the field of “information and communication technology”.

2011 Second prize for the Gilles-Kahn best PhD award, organized by the French society of computer science (SIF), and sponsored by the French academy of sciences.

2010 Best PhD thesis prize from AFRIF (French association on pattern recognition).

Grants

Pi I am leading a chair for the MIAI institute in Grenoble, 220K euros, 2019–2023.

Pi I was awarded an ERC Starting Grant, project SOLARIS, 1.5M euros, 2017–2022.

Pi Recipient of a grant from ANR, project MACARON, 350K euros, 2014–2018.

Co-Pi France Berkeley fund. “Invariant image representations and high dimensional sparse estimation for neurosciences”. with Pr. Bin Yu, 2014-2016. 8K euros.

Teaching Activities

Courses for graduate students

- 2016 – 2020 “Kernel methods for statistical learning”, ENS Paris-Saclay.
- 2015 – 2020 “Advanced learning models”, Grenoble University.
- 2014 “Kernel methods for statistical learning”, Grenoble University.
- 2013 – 2014 “Statistical machine learning and applications”, Ecole Normale Supérieure, Lyon.

Short courses in summer schools and tutorials at international conferences

- 2019 Invited tutorial at IEEE Data Science Workshop, Minneapolis, 2019.
- 2018 – 2019 Short course on large-scale machine learning given at PAISS 2018, Grenoble, at the conference QBI 2019, Rennes, and the OBA summer school, Veroli, 2019.
- 2018 Short course given at YSU – ISTC Joint Summer School on Machine Learning, Yerevan.
- 2018 Short course given at SMAI-Mode, Autrans, and MASCOT-NUM, Nantes.
- 2017 Short course given at CoSIP, Berlin.
- 2016 Lecturer at the summer school MAESTRA, Ohrid, Macedonia.
- 2010 – 2017 Short course on “Introduction to sparse estimation”, given at Paris Sciences et Lettres University, from 2014 to 2017, and in various summer schools: at SPARS’17 in Lisbon, CIMI in Toulouse, 2015, BigOptim in Grenoble, 2015, DENIS at Tampere University, Finland, CVML 2010 in Grenoble, and ERMITES 2010 in Hyères.
- 2013 Guest speaker at the IMA “new direction short course”, Minneapolis.
- 2009 – 2010 Tutorial “Sparse coding and dictionary learning for image analysis”, given at the international conferences ICCV 2009, Kyoto, and CVPR 2010, San Francisco.

Supervised students, post-docs, and research engineers

- Since 2020 Gaspard Beugnot, MsC intern.
- Since 2020 Houssam Zenati, PhD student, with E. Diemert (previously MsC intern).
- Since 2019 Alexandre Zouaoui, research engineer
- Since 2019 Bruno Lecouat, PhD student, with J. Ponce.
- Since 2019 Minttu Alakujala, PhD student, with J. Ponce and C. Schmid.
- Since 2018 Mathilde Caron, PhD student, with A. Joulin and P. Bojanowski.
- Since 2018 Grégoire Mialon, PhD student, with A. d’Aspremont (also MsC intern in 2018).
- Since 2017 Andrei Kulunchakov, PhD student, with A. Juditsky (also MSc intern in 2017).
- Since 2017 Dexiong Chen, PhD student, with L. Jacob (also MSc intern in 2016).
- 2016 – 2019 Alberto Bietti, PhD student. **Best PhD prize from University Grenoble-Alpes.**
- 2016 – 2019 Mikita Dvornik, PhD student, with C. Schmid, (also MSc intern in 2016).
- 2015 – 2020 Daan Wymen, PhD student, with C. Schmid, (also MSc intern in 2014).
- 2017 – 2019 Ghislain Durif, research engineer.
- 2015 – 2018 Arthur Mensch, PhD student, with G. Varoquaux and B. Thirion.
- 2014 – 2017 Hongzhou Lin, PhD student, with Z. Harchaoui. (previously MSc intern in 2014).
- 2014 – 2017 Thomas Dias-Alves, PhD student, with M. Blum.
- 2015 – 2016 Mattis Paulin, PhD student, with Z. Harchaoui, M. Douze, F. Perronnin, and C. Schmid. I co-advised him during the second part of his PhD.
- 2013 – 2015 Piotr Koniusz, post-doc, with Z. Harchaoui and C. Schmid.

- 2012 – 2014 Anoop Cherian, post-doc, with K. Alahari and C. Schmid.
- 2014 Claude Lucas, undergraduate, with Z. Harchaoui.
- 2013 Yuansi Chen, undergraduate, with Z. Harchaoui. **Best internship prize from Ecole Polytechnique.**
- 2012 Elsa Bernard, M.Sc. student with L. Jacob and J.-P. Vert.

Services to the Community

Editorial Activities

- 2022 Tutorial chair for CVPR 2022.
- 2021 Area chair for ICLR 2021 and AISTATS 2021.
- 2020 Co-workshop chair for NeurIPS 2020.
- 2020 Area chair for AISTATS 2020, ECCV 2020, and NeurIPS 2020.
- 2019 Area chair for NeurIPS 2019.
- 2018 Area chair for ICML 2018 and NeurIPS 2018.
- 2017 Area chair for ICML 2017 and NIPS 2017.
- 2016 Area chair for CVPR 2016, ECCV 2016, ICLR 2016 and NIPS 2016.
- 2015 Area chair for ICCV 2015 and ICML 2015.
- Since 2019 Editor for the Journal of Machine Learning Research (JMLR).
- Since 2018 Editor for SIAM Journal on Imaging Science.
- Since 2015 Editor for the International Journal of Computer Vision (also guest editor for the special issue on sparse coding in 2014).
- Since 2015 Editor for the Journal of Mathematical Imaging and Vision (JMIV).
- 2014 – 2018 Senior associate editor for IEEE Signal Processing Letters (senior editor since 2015).

Scientific Expertise

- 2017 – 2018 Judge for the IBM AI Xprize.
- 2018 Panel member for the Agence Nationale de la Recherche (ANR).
- 2017 Best PhD prize committee of PGMO.
- 2013 – 2019 Expert for the Agence Nationale de la Recherche (ANR) 2013 – 2019, and the European Research Council (ERC) 2014 and 2018.

Member of Thesis Committees

- 2019 Reviewer for the PhD thesis of Yassine Yaakoubi, Polytechnique Montréal
- 2019 Reviewer for the PhD thesis of Zhenyu Liao, Université Paris-Saclay
- 2019 Reviewer for the PhD thesis of Belhal Karimi, Université Paris-Saclay
- 2019 Reviewer for the PhD thesis of Martin Bompaire, Université Paris-Saclay
- 2018 Reviewer for the PhD thesis of Magda Gregorova, Université de Genève.
- 2018 PhD thesis committee of Saeed Varasteh Yazdi, Grenoble University
- 2017 Reviewer for the PhD thesis of Thomas Moreau, ENS Paris-Saclay.
- 2017 Reviewer for the PhD thesis of Mathieu Carrière, Ecole Polytechnique.
- 2014 PhD thesis committee of Nicolas Duforet-Frebourg, Grenoble University.
- 2013 Reviewer for the PhD thesis of Roberto Rigamonti, EPFL, Lausanne, Switzerland.

Organization of scientific events

- 2020 Organizing committee of the SIAM Conference on Imaging Science (IS20).
- 2018 – 2020 Co-organizer of the PAISS artificial intelligence summer school in Grenoble and in Paris. – cancelled in 2020 due to COVID
- 2018 Co-organizer of the Journées SMAI-MODE in Autrans.
- 2017 Organizer of the MACARON workshop in Grenoble.
- 2015 Co-organizer of the Khronos-Persyvact Large-scale Learning School in Grenoble.
- 2014 Organizer of the optimization session at the “Journées MAS” in Toulouse.
- 2009 – 2010 Co-organizer of two tutorials at the conferences ICCV 2009 and CVPR 2010.

Open-Source software

- Cyanure I am the main author of Cyanure, a new toolbox that provides state-of-the-art algorithms for empirical risk minimization.
- SPAMS I am the main author of the SPAMS toolbox, which provides efficient algorithms for sparse estimation. The software is widely used by various communities such as image and signal processing, machine learning, computer vision, bioinformatics. The package has been downloaded more than 100K times, and the URL of the software appears in more than 600 scientific publications according to Google scholar.
- FlipFlop I am also the co-author of the open-source Bioconductor package FlipFlop for transcript discovery and abundance estimation from RNA-Seq data.
- Misc I am also the author or co-author of various open-source software packages corresponding to my publications. All of them are available on my web page.

Industrial Collaborations

- 2019–2022 Collaboration with Criteo Research (CIFRE contract)
- 2019–2022 Collaboration with Google (CIFRE contract)
- 2018–2021 Collaboration with Facebook (CIFRE contract)
- 2013 Collaboration with Xerox/XRCE on natural language processing
- 2014–2017 Member of the MSR Inria joint centre

Patents

- 2014 A US patent “language model with structured sparsity” has been granted (US Patent 20,160,070,697) after a joint publication with researchers from Xerox Research Centre Europe (XRCE) at the conference EMNLP.

Selected Invited Talks

Guest lectures in international summer schools

- 07/2019 OBA summer school on machine learning, Veroli.
- 09/2018 YSU summer school on machine learning, Yerevan.
- 12/2017 COSiP winter school, Berlin.
- 06/2017 SparSA summer school, Lisbon.
- 09/2016 MAESTRA summer school, Ohrid, Macedonia.
- 08/2014 DENIS summer school, Tampere, Finland.
- 07/2013 IMA new direction short course, Minneapolis.

07/2010 International Visual Recognition and Machine Learning summer school, Grenoble.

[Invited talks in workshops or mini-symposiums](#)

08/2019 ICCOPT, Berlin.

04/2019 YES workshop, Eindhoven.

10/2018 CEFRL Workshop, ECCV, Munich.

07/2018 Theory of Deep Learning Workshop, ICML, Stockholm.

06/2018 ISMP, Bordeaux.

06/2017 JFCO, Toulouse.

06/2017 LCCC workshop, Lund.

05/2017 Pattern Recognition and Computer Vision Colloquium, Prague.

04/2017 OSL workshop, les Houches.

08/2016 Journées MAS, France.

08/2016 ICCOPT, Tokyo, Japan.

01/2016 MIA workshop, Paris, France

10/2015 CIMI workshop, Toulouse.

01/2015 BASP frontiers workshop, Villars-sur-Ollon, Switzerland.

08/2014 Journées MAS, France.

05/2014 SIAM conference on Optimization, San Diego.

03/2014 StatLearn, Paris.

06/2012 Sparsity workshop, ICML 2012. Edinburgh.

07/2011 ICML workshop on structured sparsity. Bellevue, Canada.

[Seminars](#)

06/2020 Seminar at University of Genova.

11/2018 Seminar at University of Geneva.

02/2017 Seminar at Amazon, Berlin.

02/2016 Seminar at University of British Columbia, Vancouver.

02/2016 Seminar at UC Berkeley, EECS department.

03/2015 StatLab seminar at Cambridge university, UK.

03/2013 Xerox Europe Research Center, Grenoble.

11/2012 EPFL, Lausanne.

09/2012 Biostatistics seminar, UC Berkeley.

02/2012 Neyman seminar. University of California, Berkeley.

10/2011 Seminar at University of Minnesota. Minneapolis.

[Research topics](#)

I have made several contributions in **image and signal processing, machine learning, and computer vision**. Recently, I have oriented part of my research towards **mathematical optimization** applied to **large-scale machine learning**, and established pluri-disciplinary collaborations in **bioinformatics** and **neurosciences**.

According to Google Scholar, my papers received about **20200 citations** and my **h-index is 41**.

These research directions resulted in different lines of publications detailed in the next tables, starting with peer-reviewed international journals. JMLR, IEEE-TSP, IJCV, PAMI, IEEE-TIP are the main

journals in machine learning, computer vision, signal and image processing.

Journal of Machine Learning Research (JMLR)	7
SIAM Journal on Optimization	2
IEEE Transactions on Signal Processing (IEEE-TSP)	2
Bioinformatics	2
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)	2
International Journal on Computer Vision (IJCV)	1
IEEE Transactions on Image Processing (IEEE-TIP)	1
SIAM Multiscale Modeling and Simulation	1
BMC Bioinformatics	1
Molecular Biology and Evolution (MBE)	1

Other articles are published in the proceedings of the main international conferences in machine learning: NIPS, ICML; and computer vision: ICCV, CVPR et ECCV. These five conferences are very selective with an acceptance rate in general below 25%, and their proceedings play a role which is as important as international journals.

Advances in Neural Information Processing Systems (NIPS, NeurIPS since 2018)	13
International Conference in Machine Learning (ICML)	9
IEEE International Conference on Computer Vision (ICCV)	5
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	4
European Conference on Computer Vision (ECCV)	4
International Conference on Artificial Intelligence and Statistics (AISTATS)	2
Empirical Methods on Natural Language Processing (EMNLP)	1
IEEE International Conference on Image Processing (ICIP)	1
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)	1

In addition, I have co-authored two research monographs, two review articles, and one book chapter, which are presented in the next section.

List of publications

The number of citations given by Google Scholar is given for each paper with more than 50 citations.

Monographs and review articles

- [1] J. Mairal, F. Bach and J. Ponce. Sparse Modeling for Image and Vision Processing. *Foundations and Trends in Computer Graphics and Vision*, 8(2-3), 85–283, 2014. **455 citations**.
- [2] F. Bach, R. Jenatton, J. Mairal, and G. Obozinski. Optimization with sparsity-inducing penalties. *Foundations and Trends in Machine Learning*, 4(1), 1–106, 2012. **957 citations**.
- [3] F. Bach, R. Jenatton, J. Mairal and G. Obozinski. Structured sparsity through convex optimization. *Statistical Science*, 27(4), 450–468, 2012. **303 citations**.
- [4] F. Bach, R. Jenatton, J. Mairal, and G. Obozinski. Convex optimization with sparsity-inducing norms. In S. Sra, S. Nowozin, and S. J. Wright, editors, *Optimization for Machine Learning*. MIT Press, 2011. **358 citations**.
- [5] J. Wright, Y. Ma, J. Mairal, G. Sapiro, T. Huang and S. Yan. Sparse representation for computer vision and pattern recognition. *IEEE*. 98(6):1031–1044. 2010. **1875 citations**.

Articles in peer-reviewed international journals

- [6] A. Kulunchakov and J. Mairal. Estimate Sequences for Stochastic Composite Optimization: Variance Reduction, Acceleration, and Robustness to Noise. *to appear at Journal of Machine Learning Research (JMLR)*. 2020.
- [7] N. Dvornik, J. Mairal and C. Schmid. On the Importance of Visual Context for Data Augmentation in Scene Understanding *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2019.
- [8] H. Lin, J. Mairal and Z. Harchaoui. An Inexact Variable Metric Proximal Point Algorithm for Generic Quasi-Newton Acceleration. *SIAM Journal on Optimization*. 29(2), 1408–1443, 2019.
- [9] D. Chen, L. Jacob, and J. Mairal. Biological Sequence Modeling with Convolutional Kernel Networks. *Bioinformatics*. 35(18), 3294–3302, 2019.
- [10] A. Bietti and J. Mairal. Group Invariance, Stability to Deformations, and Complexity of Deep Convolutional Representations. *Journal of Machine Learning Research (JMLR)*, 20(25), 1–49, 2019.
- [11] H. Lin, J. Mairal and Z. Harchaoui. Catalyst Acceleration for First-order Convex Optimization: from Theory to Practice. *Journal of Machine Learning Research (JMLR)*, 18(212), 1–54, 2018.
- [12] T Dias-Alves, J. Mairal and M. Blum. Loter: A Software Package to Infer Local Ancestry for a Wide Range of Species. *Molecular Biology and Evolution (MBE)*. 35(9), 2318–2326, 2018.
- [13] A. Mensch, J. Mairal, B. Thirion and G. Varoquaux. Stochastic Subsampling for Factorizing Huge Matrices *IEEE Transactions on Signal Processing*, 66(1), 112–128, 2018.
- [14] M. Paulin, J. Mairal, M. Douze, Z. Harchaoui, F. Perronnin and C. Schmid. Convolutional Patch Representations for Image Retrieval: an Unsupervised Approach. *International Journal of Computer Vision (IJCV)*, 121(1), 149–168. 2017. **61 citations**.
- [15] A. Tillmann, Y. Eldar and J. Mairal. DOLPHIn-Dictionary Learning for Phase Retrieval. *IEEE Transactions on Signal Processing*, 64(24), 6485–6500. 2016.
- [16] J. Mairal. Incremental Majorization-Minimization Optimization with Application to Large-Scale Machine Learning. *SIAM Journal on Optimization*, 25(2), 829–855, 2015. **244 citations**.
- [17] E. Bernard, L. Jacob, J. Mairal, E. Viara and J.-P. Vert. A Convex Formulation for Joint RNA Isoform Detection and Quantification from Multiple RNA-seq Samples. *BMC Bioinformatics*, 16:262, 2015.
- [18] E. Bernard, L. Jacob, J. Mairal and J.-P. Vert. Efficient RNA Isoform Identification and Quantification from RNA-Seq Data with Network Flows. *Bioinformatics*, 30(17), 2447–2455, 2014. **66 citations**.
- [19] J. Mairal and B. Yu. Supervised Feature Selection in Graphs with Path Coding Penalties and Network Flows. *Journal of Machine Learning Research (JMLR)*, 14(Aug), 2449–2485, 2013.
- [20] J. Mairal, F. Bach, and J. Ponce. Task-driven dictionary learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 34(4), 2012. **857 citations**.
- [21] J. Mairal, R. Jenatton, G. Obozinski, and F. Bach. Convex and network flow optimization for structured sparsity. *Journal of Machine Learning Research (JMLR)*, 12(9), 2649–2689, 2011. **97 citations**.

- [22] R. Jenatton, J. Mairal, G. Obozinski, and F. Bach. Proximal methods for hierarchical sparse coding. *Journal of Machine Learning Research (JMLR)*, 12(7), 2297–2334, 2011. **344 citations**.
- [23] J. Mairal, F. Bach, J. Ponce, and G. Sapiro. Online learning for matrix factorization and sparse coding. *Journal of Machine Learning Research (JMLR)*, 11(1), 19–60, 2010. **2591 citations**.
- [24] J. Mairal, G. Sapiro, and M. Elad. Learning multiscale sparse representations for image and video restoration. *SIAM Multiscale Modelling and Simulation*, 7(1):214–241, 2008. **571 citations**.
- [25] J. Mairal, M. Elad, and G. Sapiro. Sparse representation for color image restoration. *IEEE Transactions on Image Processing*, 17(1):53–69, 2008. **1768 citations**.

Articles in peer-reviewed international conferences

- [24] B. Lecouat, J. Ponce and J. Mairal Fully Trainable and Interpretable Non-Local Sparse Models for Image Restoration *European Conference on Computer Vision (ECCV)*. 2020.
- [25] N. Dvornik, C. Schmid and J. Mairal. Selecting Relevant Features from a Multi-Domain Representation for Few-shot Classification. *European Conference on Computer Vision (ECCV)*. 2020.
- [26] D. Chen, L. Jacob and J. Mairal. Convolutional Kernel Networks for Graph-Structured Data *International Conference on Machine Learning (ICML)*. 2020.
- [27] G. Mialon, A. d’Aspremont, and J. Mairal. Screening Data Points in Empirical Risk Minimization via Ellipsoidal Regions and Safe Loss Function. *International Conference on Artificial Intelligence and Statistics (AISTATS)*. 2020.
- [28] D. Chen, L. Jacob and J. Mairal. Recurrent Kernel Networks. *Advances in Neural Information Processing Systems (NeurIPS)*. 2019.
- [29] A. Kulunchakov and J. Mairal. A Generic Acceleration Framework for Stochastic Composite Optimization. *Advances in Neural Information Processing Systems (NeurIPS)*. 2019.
- [30] A. Bietti and J. Mairal. On the Inductive Bias of Neural Tangent Kernels. *Advances in Neural Information Processing Systems (NeurIPS)*. 2019.
- [31] M. Caron, P. Bojanowski, J. Mairal and A. Joulin. Unsupervised Pre-Training of Image Features on Non-Curated Data. *International Conference on Computer Vision (ICCV)*. 2019.
- [32] N. Dvornik, C. Schmid and J. Mairal. Diversity with Cooperation: Ensemble Methods for Few-Shot Classification. *International Conference on Computer Vision (ICCV)*. 2019.
- [33] A. Kulunchakov and J. Mairal. Estimate Sequences for Variance-Reduced Stochastic Composite Optimization. *International Conference on Machine Learning (ICML)*. 2019.
- [34] A. Bietti, G. Mialon, D. Chen, and J. Mairal. A Kernel Perspective for Regularizing Deep Neural Networks. *International Conference on Machine Learning (ICML)*. 2019.
- [35] D. Wynen, C. Schmid and J. Mairal. Unsupervised Learning of Artistic Styles with Archetypal Style Analysis. *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.
- [36] M. Dvornik, J. Mairal and C. Schmid. Modeling Visual Context is Key to Augmenting Object Detection Datasets. *European Conference on Computer Vision (ECCV)*, 2018.

- [37] C. Paquette, H. Lin, D. Drusvyatskiy, J. Mairal and Z. Harchaoui. Catalyst for Gradient-Based Non-Convex Optimization. *International Conference on Artificial Intelligence and Statistics (AISTATS)*. 2018. **61 citations (with tech report)**.
- [38] A. Bietti and J. Mairal. Invariance and Stability of Deep Convolutional Representations. *Advances in Neural Information Processing Systems (NIPS)*, 2017.
- [39] A. Bietti and J. Mairal. Stochastic Optimization with Variance Reduction for Infinite Datasets with Finite-Sum Structure. *Advances in Neural Information Processing Systems (NIPS)*, 2017.
- [40] A. Mensch, J. Mairal, D. Bzok, B. Thirion and G. Varoquaux. Learning Neural Representations of Human Cognition across Many fMRI Studies. *Advances in Neural Information Processing Systems (NIPS)*, 2017.
- [41] N. Dvornik, K. Shmelkov, J. Mairal, and C. Schmid BlitzNet: A Real-Time Deep Network for Scene Understanding *International Conference on Computer Vision (ICCV)*, 2017. **84 citations**.
- [42] J. Mairal. End-to-End Kernel Learning with Supervised Convolutional Kernel Networks. *Advances in Neural Information Processing Systems (NIPS)*, 2016. **72 citations**.
- [43] A. Mensch, J. Mairal, B. Thirion and G. Varoquaux. Dictionary Learning for Massive Matrix Factorization. *International Conference on Machine Learning (ICML)*, 2016.
- [44] A. Tillmann, Y. Eldar and J. Mairal. Dictionary Learning from Phaseless Measurements. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2016.
- [45] H. Lin, J. Mairal and Z. Harchaoui. A universal catalyst for first-order optimization. *Advances in Neural Information Processing Systems (NIPS)*, 2015. **329 citations**.
- [46] M. Paulin, M. Douze, Z. Harchaoui, J. Mairal, F. Perronnin and C. Schmid. Local Convolutional Features with Unsupervised Training for Image Retrieval. *International Conference on Computer Vision (ICCV)*, 2015. **154 citations**.
- [47] J. Mairal, P. Koniusz, Z. Harchaoui and C. Schmid. Convolutional kernel networks. *Advances in Neural Information Processing Systems (NIPS)*, 2014. **310 citations**.
- [48] Y. Chen, J. Mairal and Z. Harchaoui. Fast and Robust Archetypal Analysis for Representation Learning. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014. **74 citations**.
- [49] A. Cherian, J. Mairal, K. Alahari and C. Schmidt. Mixing Body-Part Sequences for Human Pose Estimation. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014. **103 citations**.
- [50] H. O. Song, R. Girshick, S. Jegelka, J. Mairal, Z. Harchaoui and T. Darrell. On learning to localize objects with minimal supervision. In *International Conference on Machine Learning (ICML)*, 2014. **214 citations**.
- [51] J. Mairal. Stochastic Majorization-Minimization Algorithms for Large-Scale Optimization. *Advances in Neural Information Processing Systems (NIPS)*, 2013. **101 citations**.
- [52] A. Nelakanti, C. Archambeau, J. Mairal, F. Bach and G. Bouchard. Log-linear Language Models based on Structured Sparsity. *Proceedings of Empirical Methods on Natural Language Processing (EMNLP)*. 2013.

- [53] J. Mairal. Optimization with First-Order Surrogate Functions. In *International Conference on Machine Learning (ICML)*, 2013. **164 citations**.
- [54] J. Mairal and B. Yu. Complexity Analysis of the Lasso Regularization Path. In *Proceedings of the International Conference on Machine Learning (ICML)*, 2012. **102 citations**.
- [55] L. Benoit, J. Mairal, F. Bach, and J. Ponce. Sparse image representation with epitomes. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2011.
- [56] J. Mairal, R. Jenatton, G. Obozinski, and F. Bach. Network flow algorithms for structured sparsity. In *Advances in Neural Information Processing Systems (NIPS)*, 2010. **175 citations**.
- [57] R. Jenatton, J. Mairal, G. Obozinski, and F. Bach. Proximal methods for sparse hierarchical dictionary learning. In *International Conference on Machine Learning (ICML)*, 2010. **422 citations**.
- [58] J. Mairal, F. Bach, J. Ponce, G. Sapiro, and A. Zisserman. Non-local sparse models for image restoration. In *IEEE International Conference on Computer Vision (ICCV)*, 2009. **1583 citations**.
- [59] J. Mairal, F. Bach, J. Ponce, and G. Sapiro. Online dictionary learning for sparse coding. In *International Conference on Machine Learning (ICML)*, 2009. **2100 citations**.
- [60] J. Mairal, F. Bach, J. Ponce, G. Sapiro, and A. Zisserman. Supervised dictionary learning. In *Advances in Neural Information Processing Systems (NIPS)*. 2008. **1245 citations**.
- [61] J. Mairal, M. Leordeanu, F. Bach, M. Hebert, and J. Ponce. Discriminative sparse image models for class-specific edge detection and image interpretation. In *European Conference on Computer Vision (ECCV)*, 2008. **252 citations**.
- [62] J. Mairal, F. Bach, J. Ponce, G. Sapiro, and A. Zisserman. Discriminative learned dictionaries for local image analysis. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2008. **908 citations**.
- [63] J. Mairal, G. Sapiro, and M. Elad. Multiscale sparse image representation with learned dictionaries. In *IEEE International Conference on Image Processing (ICIP)*, 2007. **82 citations**.
- [64] J. Mairal, R. Keriven, and A. Chariot. Fast and efficient dense variational stereo on GPU. In *Proceedings of 3D Data Processing, Visualization and Transmission (3DPVT)*, 2006.

[Invited papers in international conferences](#)

- [61] J. Mairal, R. Jenatton, G. Obozinski and F. Bach. Learning hierarchical and topographic dictionaries with structured sparsity. In *SPIE conference on wavelets and sparsity XIV*, 2011.
- [62] J. Mairal, M. Elad, and G. Sapiro. Sparse learned representations for image restoration. In *4th World conference of the International Association of Statistical Computing (IASC)*, 2008.

[Technical reports / submitted papers](#)

- [63] B. Lecouat, J. Ponce and J. Mairal. Designing and Learning Trainable Priors with Non-Cooperative Games. *preprint arXiv:2006.14859*. 2020.
- [64] G. Mialon, D. Chen, A. d’Aspremont and J. Mairal. An Optimal Transport Kernel for Feature Aggregation and its Relationship to Attention. *preprint arXiv:2006.12065*. 2020.

- [65] M. Caron, I. Misra, J. Mairal, P. Goyal, P. Bojanowski, and A. Joulin. Unsupervised Learning of Visual Features by Contrasting Cluster Assignments. *preprint arXiv:2006.09882*. 2020.
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