Nicolas Papadakis

November 20th, 1981
French
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Professional

2013 - **CNRS Confirmed Researcher** in image processing at Institut de Mathématiques de Bordeaux.

2018 - 2019 **Visiting researcher** at Department of Applied Mathematics and Theoretical Physics, University of Cambridge.

2010 - 2012 **CNRS Junior Researcher** in image processing at Laboratoire Jean Kuntzmann, Inria team MOISE.

2007 - 2010 **Post doctoral position** in "Depth estimation and novel view synthesis", Barcelona Media, Universitat Pompeu Fabra, Barcelona. Supervisor: Vicent Caselles.

Diplomas

2015 **Habilitation thesis on Applied mathematics**: Optimal Transport for Image Processing.

2004 - 2007 **Ph.D on Applied mathematics**, VISTA Group, IRISA/INRIA Rennes, France. Thesis on image assimilation: application to curve and vector field tracking. Supervisor: Étienne Mémin.

2003 - 2004 **Master of science in Analysis and Stochastic Models**, university of Rouen, France. Thesis on $\mathcal{C}^1$ approximation of oceanographic surface from lagragian data. Supervisor: Christian Gout.

1999 - 2004 **Master of Engineering in Applied Mathematics and Computer Sciences** from the INSA (National Institute of Applied Sciences), Rouen, France.

Research Interests

Subjects: Image and video processing, optimal transport, variational methods, inverse problems, convex optimization, non-local methods, machine learning.

Applications in computer vision: Segmentation, denoising, motion/depth estimation, registration, object tracking, histogram equalization, colorization, video surveillance, synthesis of virtual cameras, urban reconstruction.

Applications in geosciences: Assimilation of image data in geophysical dynamical models, learning of periodic flows characteristics from image sequences.

Distinctions

2019 **Prime d'Encadrement Doctoral et de Recherche** of CNRS.
2014 **Prime d'Excellence Scientifique** of CNRS.
2008 - 2010 Spanish Research Grant **Torres Quevedo**
2008 **Best Ph.D. thesis Award of EADS** Enterprise Fundation for Geosciences.
2008 **Best Ph.D. thesis Award of AFRIF**, French Association for Pattern Recognition, 2008.

Scientific Coordination and Organization

National

2017 - 2020 Co-director of the Groupe de Recherche "Mathématiques de l'Imagerie et de ses Applications" **GdR MIA**)
2019- Member of the Scientific committee dor "Intelligence Artificielle " of French ANR

Program Committee

2015 -   International Conference on Scale Space and Variational Methods (SSVM)
2016 -   National Conference on Reconnaissance des Formes et l'Intelligence Artificielle (RFIA)

Organization of conferences and workshops

Jan. 2021   International Conference on Mathematical Image Analysis" (MIA'21), Paris.
Jul. 2020   Minisymposium - Semi-supervised learning, SIAM Image Science, Toronto.
Jul. 2019   Journée commune des GdR ISIS et MIA: Transp. optimal en apprentissage stat. & trait. signal, Ivry.
Nov. 2018   Journées communes des GdR MIA et ImaBio: "Microscopie et traitement d'image", Illkirch.
June 2018   Mini-symposium "Optimal Transp. and Patch Meth. for Color Image Editing", SIAM SIIMS, Bologna.
Oct. 2017   Journées annuelles 2017 des GdR MOA et MIA, IMB, Bordeaux.
Oct. 2016   Workshop on Optimal Transport and Optimization in Imaging, Inria, Paris.
Oct. 2015   Workshop on Optimal Transport: Numerics and Applications, IMB, Bordeaux.
June 2015   International Conference on Scale Space and Variational Methods, SSVM, Cap Ferret.
Apr. 2014   Second Workshop on Mathematical Analysis of Images in Bordeaux, LaBRI, Bordeaux.
Nov. 2013   First Workshop on Optimization for Image and Signal Processing, École Polytechnique.
Oct. 2013   Workshop on Modelisation with optimal transport, ANR TOMMI, Grenoble.
May 2013   Mini-Symposium Méthodes Numériques pour le Transport Optimal, Seignosse, SMAI.
Nov. 2012   Journées Bordelaises d'Analyse Mathématique des Images, IMB, Bordeaux.

Life of Laboratory

2019 -   Member of the "Environmental Impact" working group of IMB.
2017 - 2018 Member of the Laboratory Committee of IMB.
2013 -   Member of the Consultative Committee in Applied Mathematics of IMB.
2015 - 2016 Co-director of Image team at IMB.
2013 - 2016 Monthly **Signal-Image**, inter-laboratory IMB/IMS/LaBRI seminar.
2010 - 2012 Monthly **working group** of Inria team MOISE, LJK.
2010 - 2012 Weekly **EDP-MOISE**, seminar, LJK.
2010 - 2011 Monthly seminar **Optimal Transport**, LJK.

Expertise

2019   Evaluation of projects for Normandie Université.
2018   Evaluation of project for program ECOS Nord Colombie.
2015-   Evaluation of projects for French ANR.
2012-   Evaluation of projects for LEFE/MANU of CNRS.
2010 -   Reviewer for IEEE Trans. on Image Processing, IEEE Trans. on Pattern Analysis and Machine
              Intelligence, Journal on Mathematical Imaging and Vision, SIAM J. on Imaging Sciences, Multiscale
              Modeling and Simulation, Tellus Series A, IEEE CVPR, IEEE ICCV, ECCV, SSVM, NIPS, ICML
2009   Member of AFRIF jury for the 2009 best PhD award.

Supervision and Teaching

PhD supervision

2015 - 2018 E. Cazelles, **Univ. Bordeaux**, co-direction with J. Bigot, IMB. PCA in Wasserstein spaces.
2014 - 2017 R. Giraud (Associate professor), **Univ. Bordeaux, Cluster d'Excellence CPU**, co-supervision with
              V.-T. Ta, LaBRI. Matching Algorithms and Superpixels for Image Analysis and Processing .
2012 - 2016 R. Hug (Assistant professor), **Grenoble INP**, co-direction with E. Maitre, LJK. Optimal transport with
              physical constraints.
2012 - 2014 R. Yıldızoğlu (Math teacher), **Univ. Bordeaux**, co-direction with J.-F. Aujol and C. Dossal, IMB. Con-
              vexification methods and texture segmentation.

Post-doctorate supervision

2019 - 2020 A. Houdard, **Univ. Bordeaux**. Machine Learining and Optimal Transport.
2015 - 2016 A. Dessein (Research Eng., Qucit), **CPU, Univ. Bordeaux**. Optimal Transport for audio processing.
2012   A. Makris (Researcher, Crete), **UJF**. Image assimilation for oceanography.

Internship supervision

2017	A. Thibault. **License 3**, ENS Paris, Optimal Transport and proximal algorithms.
2016	L. Boisseuil. **Master 1**, MMSI, Univ. Bordeaux. Image segmentation.
2014	C. Collin. **Master 1**, MIMSE, Univ. Bordeaux. Detection of faces in videos.
2013	E. Nicolas. **Master 1**, MIMSE, Univ. Bordeaux. Extraction of 3D neuronal networks in microscopy.

Teaching

2019 -	Image processing, Master 2 IS and MMSI, Univ. Bordeaux.
2018	Deep learning and PDEs, Doctoral program, Univ. Cambridge.
2016 - 2018	PDE and Image processing, Master 2 TDSI, Univ. Bordeaux.
2015 - 2017	Computer vision project, Master 2 IPCV, Bordeaux.
2016 - 2018	Linear solvers, Master 1 Matmeca, Bordeaux.
2014 - 2016	PDE and Image processing, Master 1 TDSI, Univ. Bordeaux.
2014	Numerical algorithms, License 3 Enseirb, Bordeaux.
2013 - 2015	Numerical analysis, License 3 Matmeca, Bordeaux.

Contractual activities

Project leading

2016 - 2020	PI of project **GOTMI** Generalized Optimal Transport Models for Image processing, funded by ANR.
2015 - 2016	PI of project **DADOT** Data Analysis with Discrete Optimal Transport, funded by "Bis Japan" project, IdEX Bordeaux, for collaboration with Kyoto University.
2015 - 2016	PI of project Optimal Transport and Audio Processing, Cluster CPU.
2014 - 2016	PI of project Editing with Non-local methods, Cluster CPU.
2012 - 2015	PI of project **TOSCANA** Optimal Transport with Physical Constraints, Numerical Analysis and Application to data Assimilation, funded by Grenoble INP.
2011 - 2013	PI of project **ASIOME**: Assimilation of Oceanographic Image Structures and Error Modelling, funded by the pole MSTIC of Joseph Fourier University and LEFE/MANU program of INSU, CNRS.

Projects

2019 - 2023	Work Package leader of ANR PRCE project **PostProdLEAP**: rethinking archive PostProduction with LEarning, vAriational, and Patch-based methods. PI: A. Bugeau (Univ. Bordeaux).
2018 - 2022	Local coordinator of RISE project **NoMADS**: Nonlocal Methods for Arbitrary Data Sources (H2020 - Marie Skłodowska-Curie - RISE). PI: D. Tenbrinck (Univ. Münster).
2017 - 2021	ANR project **BOOST-SWOT** : Building Of Ocean Surface Topography maps with SWOT. PI: E. Cosme (IGE, Grenoble).
2017 - 2018	OSTST project **MOMOMS** (CNES et NASA): Merging Ocean Models and Observations at Mesoscale and Submesoscale. PI: E. Cosme (IGE, Grenoble).
2015 - 2016	CNRS Imag'in project **CAVALIERI**: CAlculus of VAriations for Imaging: Editing and Retrieval of Images. PI: V. Duval (Inria, Rocquencourt).
2013 - 2016	Signal-Image of **Cluster d'Excellence CPU**.
2012 - 2015	Project PGMO **MAORI** (program: Mathematics and optimization for images, in the setting of the Gaspard Monge call on optimization and operational research. PI: M. Kowalski (Supelec).
2012 - 2015	Aquitaine region project "Modeling for multi-modal data". PI: J-F. Aujol (IMB).
2011 - 2015	Work Package leader of French **ANR project TOMMI**: Optimal Transportation and Image Multiphysics Models. PI : E. Maitre (Grenoble INP).
2012 - 2013	Programm **SWOT/Ocean** of CNES: Assimilation of images in oceanography.

Scientific Diffusion

Communication/Vulgarisation

2019	Soirée Classe préparatoires de Bordeaux: Assimilation d'images en Océanographie
2019	Article Interstices: Apprendre à coloriser des images
2018	Journal de l'INSMI: Transport optimal de sable avec une pelle et un seau, nouveaux outils pour l'analyse statistique de données ?
2011	Fête de la science in LJK: Color Transfer demo

Invited presentations

Mar. 2020	Meeting SIGMA 2020, Marseille.
Jul. 2019	International Congress on Industrial and Applied Mathematics, Valencia, Spain
Feb. 2019	Workshop Variational methods and optimization in imaging, IHP, Paris
Nov. 2018	DAMTP, Cambridge Image Analysis seminar, Cambridge, UK.
June 2017	Journées Image, Optimisation, Probabilité et Statistique, Le Teich.
Mar. 2017	Imaging in Paris, Paris.
Sep. 2016	CSASC joint meeting of the Czech, Slovenian, Austrian, Slovak and Catalan math. soc., Barcelona.
June 2016	PICOF (Problèmes Inverses, Contrôle et Optimisation de Formes), Autrans, France.
Oct. 2015	1st Appl. Math. Symp. Variational Methods for Dynamic Inv. Prob. and Imaging, Münster, Germany.
Jul. 2015	IFIP TC7 Conference 2015 on System Modelling and Optimization, Nice.
Apr. 2015	Kyoto University Informatics Seminar, Kyoto, Japan.
Nov. 2014	Workshop on Optimal Transport, Toulouse.
June 2014	Laboratoire Mathématiques, Images and Applications, Univ. de la Rochelle.
May 2014	SIAM Conf. on Image Sciences, Hong-Kong.
Jan. 2014	Institut de Mathématiques de Toulouse.
Jan. 2014	Colloque LEFE (INSU/CNRS), Météo-France, Toulouse.
Dec. 2013	SIAM Conference on analysis of PDE, Orlando, US.
Sep. 2013	Congrès GRETSI, Signaux et Images en Océanographie, Brest.

Softwares

2019	Matlab code for Variational Osmosis Model for Image Fusion in Cultural Heritage [J36]
2019	Matlab code for Re-fitting solution of restoration problems with ℓ_{12} regularization [C34]
2019	Matlab code for Approximate Wasserstein distance [J34]
2018	Matlab codes for Geodesic PCA in Wasserstein space [J27], Superpixel regularity measure [J24] and Superpixel color transfer [C31]
2017	Matlab code for Over-relaxed Sinkhorn algorithm, Superpixel decomposition [C30, J26] and ROT mover's distances [J28]
2016	Collaborative image colorization Colociel based on [C23,J17]. Dépôt Agence de Protection des Programmes N^o IDDN.FR.001.080021.000.S.P.2016.000.2100
2015	Integration of OPAL [J20] in the Automated MRI Brain volumetry system volBrain.
2015	Matlab codes for histogram-based segmentation of color images [C21,C24,J25] and Histogram transfer [C27] .
2013	Matlab code for continuous [J15] and discrete [J16] computation of Optimal Transport .
2011	QT Interface of color transfer between images [J10]
2010	C++ software of object tracking in videos [J9].
2010	C++ software on urban reconstruction from aerial images [J7], Barcelona3D project .
2007	Fluid motion estimation softwares for the European project FluID: Vorticity estimation [J4] and characterization of turbulent structures [J2].

Scientific Publications

Published : 34 international journals and 37 international conferences with peer-reviews. H-index 23 (Google Scholar, Sept. 2019).

Pre-prints

J40 C.-A. Deledalle, **N. P.**, J. Salmon and S. Vaiter – Block based refitting in ℓ_{12} sparse regularisation – *Submitted to Journal of Mathematical Imaging and Vision*, 2019.

J39 A. I. Aviles-Rivero, **N. P.**, R. Li, S. M. Alsaleh, R. T Tan and C.-B. Schoenlieb – Beyond Supervised Classification: Extreme Minimal Supervision with the Graph 1-Laplacian – *arXiv preprint arXiv:1906.08635*, 2019.

J38 R. Ke, A. Bugeau, **N. P.**, P. Schuetz and C.-B. Schoenlieb – A multi-task U-net for segmentation with lazy labels – *arXiv preprint arXiv:1906.12177*, 2019.

J37 S. Parisotto, L. Calatroni, A. Bugeau, **N. P.** and C.-B. Schoenlieb – A Variational Osmosis Model for Image Fusion in Cultural Heritage – *Submitted to IEEE Trans. on Image Processing*, 2019.

J36 L. Gómez-Navarro, E. Cosme, J. Le Sommer, **N. P.** and A. Pascual – Development of an image de-noising method in preparation for the Surface Water and Ocean Topography satellite mission – *Submitted to Geosciences*, 2019.

J35 A. El Hamid, M. Saleh, **N. P.** and B. Denis de Senneville – A Proper Generalized Decomposition approach for Optical Flow estimation – *Submitted to Mathematical Methods in the Applied Sciences*, 2019.

J34 R. Hug, E. Maitre and **N. P.** – On the convergence of augmented Lagrangian method for optimal transport between nonnegative densities, *Submitted to Journal of Mathematical Analysis and Applications*, 2018.

International Journals

J33 J. Bigot, E. Cazelles and **N. P.** – Central limit theorems for Sinkhorn divergence between probability distributions on finite spaces and statistical applications – *to appear in Electronic Journal of Statistics*, 2018.

J32 J. Bigot, E. Cazelles and **N. P.** – Data-driven regularization of Wasserstein barycenters with an application to multivariate density registration – *to appear in Information and Inference: A Journal of the IMA*, 2019.

J31 J. Bigot, E. Cazelles and **N. P.** – Penalization of barycenters in the Wasserstein space – *SIAM Journal on Mathematical Analysis*, 51(3): 2261–2285, 2019.

J30 T. Feld, J.-F. Aujol, G. Gilboa and **N. P.** – Rayleigh quotient minimization for absolutely one-homogeneous functionals, *to appear in Inverse Problems*, 2019.

J29 E. Cazelles, V. Seguy, J. Bigot, M. Cuturi and **N. P.** – Geodesic PCA versus Log-PCA of histograms in the Wasserstein space – *SIAM Journal on Scientific Computing*, 40(2),: B429–B456, 2018.

J28 A. Dessein, **N. P.** and J.-L. Rouas – Regularized Optimal Transport and the Rot Mover's Distance – *Journal of Machine Learning Research*, 15: 1-53, 2018.

J27 A. Aujol, G. Gilboa and **N. P.** – Theoretical Analysis of Flows Estimating Eigenfunctions of One-homogeneous Functionals – *SIAM Journal on Imaging Sciences*, 11(2): 1416–1440, 2018.

J26 R. Giraud, V.-T. Ta and **N. P.** – Robust Superpixels using Color and Contour Features along Linear Path – *Computer Vision and Image Understanding*, 2018.

J25 **N. P.** and J. Rabin – Convex Histogram-Based Joint Image Segmentation with Regularized Optimal Transport Cost - *Journal of Mathematical Imaging and Vision*, 59(2): 161 - 186, 2017.

J24 R. Giraud, V.-T. Ta and **N. P.** – Evaluation Framework of Superpixel Methods with a Global Regularity Measure – *Journal of Electronic Imaging*, 26(6): 2017.

J23 R. Giraud, A. Bugeau, P. Coupé, V.-T. Ta and **N. P.** – SuperPatchMatch: an Algorithm for Robust Correspondences of Superpixel Patches – *IEEE Transactions on Image Processing*, 26(8): 4068 - 4078, 2017.

J22 C.-A. Deledalle, **N. P.**, J. Salmon and S. Vaiter –CLEAR: Covariant LEAst-square Re-fitting with applications to image restoration – *SIAM Journal on Imaging Sciences*, 10 (1):243-284, 2017.

J21 C. Zachiu, **N. P.**, M. Ries, C. Moonen and B. Denis de Senneville –A robust optical flow tracking technique for real-time MR-guided external beam therapies in moving organs – *Physics in Medicine and Biology*, 60(23): 9003-29, 2015.

J20 R. Giraud, V.T. Ta, P. Coupé, **N. P.**, L. Collins and J. V. Manjón – Optimized Patchmatch for Multi-scale and Multi-feature label fusion – *NeuroImage*, 124: 770-82, 2015.

J19 R. Hug, E. Maitre and **N. P.** – Multiphysics optimal transportation and image interpolation – *ÈSAIM: Mathematical Modelling and Numerical Analysis, Special Issue - Optimal Transport*, 49(6): 1671 - 1692, 2015.

J18 V. Chabot, M. Nodet, **N. P.** and A. Vidard. – Accounting for observation errors in image data assimilation – *Tellus A: Dynamic Meteorology and Oceanography*, 67, 2015.

J17 F. Pierre, J.-F. Aujol, A. Bugeau, **N. P.** and V.-T. Ta – Luminance-Chrominance Model for Image Colorization – *SIAM Journal on Imaging Sciences*, 8(1): 536–563, 2015.

J16 S. Ferradans, **N. P.**, G. Peyré and J.-F. Aujol – Regularized discrete optimal transport – SIAM Journal on Imaging Sciences, 7(1): 212–238, 2014.

J15 **N. P.**, G. Peyré, É. Oudet. – Optimal Transport with Proximal Splitting – *SIAM Journal on Imaging Sciences*, 7(1): 212-238, 2014.

J14 A. Bugeau, V-T. Ta and **N. P.** – Variational exemplar-based image colorization – *IEEE Transactions on Image Processing*, 23(1): 298-307, 2013.

J13 **N. P.**, R. Yıldızoğlu, J.-F. Aujol and V. Caselles – High-Dimension Multilabel Problems: Convex or Nonconvex Relaxation? – *SIAM Journal on Imaging Sciences*, 6(4): 2603-2639, 2013.

J12 **N. P.**, A. Bugeau and V. Caselles – Image editing with spatiograms transfer – *IEEE Transactions on Image Processing*, 21(5): 2513 - 2522, 2012.

J11 **N. P.**, A. Baeza, A. Bugeau, O. D'Hondt, P. Gargallo, V. Caselles X. Armangué, I. Rius, and S. Sagàs – Virtual camera synthesis for soccer game replays – *Journal of Virtual Reality and Broadcasting*, 9(5): 2012.

J10 **N. P.**, E. Provenzi and V. Caselles – A Variational Model for Histogram Transfer of Color Images *IEEE. Transactions on Image Processing*, 20, Issue 6, 1682 - 1695, 2011.

J9 **N. P.** and A. Bugeau – Tracking with occlusions via graph cuts – *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 33(1): 144-157, 2011.

J8 A. Baeza, V. Caselles, P. Gargallo and **N. P.** – A narrow band method for the convex formulation of discrete multi-label problems – *SIAM Multiscale Modeling and Simulation*, 8(5): 2048-2078, 2010.

J7 **N. P.** and V. Caselles – Multi-label depth estimation for graph cuts stereo problems – *Journal of Mathematical Imaging and Vision*, 38(1): 70-82, 2010.

J6 **N. P.**, É. Mémin, A. Cuzol and N. Gengembre – Data assimilation with the Weighted Ensemble Kalman Filter – *Tellus Series A: Dynamic Meteorology and Oceanography*, 62(5): 673-697, 2010.

J5 T. Corpetti, P. Héas, É. Mémin and **N. P.** – Pressure image assimilation for atmospheric motion estimation – *Tellus Series A: Dynamic Meteorology and Oceanography*, Vol. 61, Issue 1, pp.160-178, 2009.

J4 **N. P.** and É. Mémin – Variational assimilation of fluid motion from image sequence – *SIAM Journal on Imaging Sciences*, Vol. 1, Issue 4, pp. 343-363, 2008.

J3 **N. P.** and É. Mémin – A variational technique for time consistent tracking of curves and motion – *Journal of Mathematical Imaging and Vision*, Vol. 31, Issue 1, pp. 81-103, 2008.

J2 J. D'adamo, **N. P.**, É. Mémin and G. Artana – Variational assimilation of POD low-order dynamical systems – *Journal of Turbulence*, Vol. 8, 2007.

J1 P. Héas, É. Mémin, **N. P.** and A. Szantai – Layered estimation of atmospheric mesoscale dynamics from satellite imagery – *IEEE transactions on Geosciences and Remote Sensing*, Vol. 45, Issue 12, Part 2, pp. 4087-4104, 2007.

International Conferences with peer review

C37 A. I. Aviles-Rivero, **N. P.**, R. Li, Q. Fan, R. T. Tan and C.-B. Schoenlieb – GraphX$^{\textbf{NET}}$−: Chest X-Ray Classification Under Extreme Minimal Supervision – *International Conference on Medical Image Computing and Computer Assisted Intervention, MICCAI'19*, China, 2019.

C36 R. Giraud, V.-T. Ta, **N. P.** and Y. Berthoumieu – Texture-aware superpixel segmentation – *IEEE International Conference on Image Processing, ICIP'19*, Taiwan, 2019.

C35 P. Sellars, A. I. Aviles-Rivero, **N. P.**, D. Coomes, A. Faul and C.-B. Schönlieb – Learning with minimal supervision with graphs: Covariance based Superpixels for hyperspectral image classification – *IEEE Int. Geoscience and Remote Sensing Symp, IGARSS'19*, Japan, 2019.

C34 C.-A. Deledalle, **N. P.**, J. Salmon and S. Vaiter – Refitting solutions promoted by ℓ_{12} structured sparse analysis with block penalties – *Scale Space and Variationnal Methods, SSVM'19*, Germany, 2019.

C33 F. Pierre, J.-F. Aujol, C.-A. Deledalle and **N. P.**– Luminance Guided Chrominance Denoising with Debiased Coupled Total Variation – *Int. Conf. on Energy Minimization Methods in Computer Vision and Pattern Recognition, EMMCVPR'17*, Italy, 2017.

C32 E. Cazelles, J. Bigot and **N. P.**– Regularization of Barycenters in the Wasserstein Space – *Conference on Geometric Science of Information, GSI'17*, France, 2017.

C31 R. Giraud, V.-T. Ta and **N. P.** – Superpixel-based Color Transfer – *International Conference on Image Processing, ICIP'7*, China, 2017.

C30 R. Giraud, V.-T. Ta and **N. P.** – Robust Shape Regularity Criteria for Superpixel Evaluation – *International Conference on Image Processing, ICIP 2017*, China, 2017.

C29 C. Zachiu, **N. P.**, M. Ries, C. Moonen and B. Denis de Senneville – A robust optical flow tracking technique for real-time MR-guided external beam therapies in moving organs – *IEEE International Symposium on Biomedical Imaging, ISBI'16*, Czech Republic, 2016.

C28 R. Giraud, V.-T. Ta and **N. P.** – SCALP: Superpixels with Contour Adherence using Linear Path – *International Conference on Pattern Recognition, ICPR 2016*, Mexico, 2016.

C27 J. Rabin and **N. P.** – Non-convex relaxation of optimal transport for color transfer between images – *Conference on Geometric Science of Information, GSI'15*, France, 2015.

C26 C.-A. Deledalle, **N. P.** and J. Salmon – On debiasing restoration algorithms: applications to total-variation and nonlocal-means – *Scale Space and Variationnal Methods, SSVM'15*, France, 2015.

C25 J.-F. Aujol, G. Gilboa and **N. P.** – Fundamentals of Non local Total Variation Spectral Theory – *Scale Space and Variationnal Methods, SSVM'15*, Claouey, France, 2015.

C24 J. Rabin and **N. P.** – Global Color Image Segmentation with Optimal-transport Distances – *Scale Space and Variationnal Methods, SSVM'15*, France, 2015.

C23 F. Pierre, J.-F. Aujol, A. Bugeau, **N. P.** and V.-T. Ta – Exemplar-based colorization in RGB color space – *IEEE Int. Conf. on Image Processing, ICIP'14*, France, 2014.

C22 S. Ferradans, J. Rabin and **N. P.** – Adaptive color transfer with relaxed optimal transport – *IEEE Int. Conf. on Image Processing, ICIP'14*, France, 2014.

C21 R. Yıldızoğlu, **N. P.** and J.-F. Aujol – A convex formulation for histogram based binary segmentation – *Int. Conf. on Energy Minimization Methods in Computer Vision and Pattern Recognition, EMMCVPR'13*, Sweden, 2013.

C20 S. Ferradans, **N. P.**, J. Rabin, G. Peyré and J.-F. Aujol – Regularized discrete optimal transport – *Int. Conf. on Scale Space and Variational Method in Computer Vision, SSVM'13*, Austria, 2013.

C19 A. Makris and **N. P.** – Data assimilation with state alignment using high-level image structures detection – *Int. Conf. on Computer Vision and Remote Sensing, CVRS'12*, China, 2012.

C18 R. Yıldızoğlu, J.-F. Aujol and **N. P.** – Active Contours without Level Sets – *IEEE Int. Conf. on Image Processing, ICIP'12*, US, 2012.

C17 A. Hervieu, **N. P.**, A. Bugeau, P. Gargallo and V. Caselles – Stereoscopic image inpainting using scene geometry – *IEEE Int. Conf. on Multimedia and Expo, ICME'11*, Spain, 2011.

C16 A. Bugeau, P. Gargallo, O. D'Hondt, A. Hervieu, **N. P.** and V. Caselles – Coherent Background Video Inpainting through Kalman Smoothing along Trajectories – *Vision, Modeling and Visualization Workshop, VMV'10*, Germany, 2010.

C15 **N. P.**, A. Baeza, X. Armangué, I. Rius, A. Bugeau, O. D'Hondt, P. Gargallo, V. Caselles and S. Sagàs – Virtual camera synthesis for soccer game replays – *European Conf. on Visual Media Production, CVMP'10*, UK, 2010.

C14 **N. P.**, A. Baeza, P. Gargallo and V. Caselles – Polyconvexification of the multi-label optical flow problem – *IEEE Int. Conf. on Image Processing , ICIP'10*, Hong-Kong, 2010.

C13 A. Hervieu, **N. P.**, A. Bugeau, P. Gargallo and V. Caselles – Stereoscopic image inpainting: distinct depth maps and images inpainting – *Int. Conf. on Pattern Recognition, ICPR'10*, Turkey, 2010.

C12 T. Corpetti, P. Héas, É. Mémin and **N. P.** – Pressure image assimilation for atmospheric motion estimation – *IEEE Int. Geoscience and Remote Sensing Symp, IGARSS'08*, US, 2008.

C11 **N. P.** , P. Héas and É. Mémin – Image assimilation for motion estimation of atmospheric layers with shallow-water model – *Asian Conference on Computer Vision, ACCV'07*, Japan, 2007.

C10 **N. P.** and É. Mémin – Variational optimal control technique for the tracking of deformable objects – *IEEE International Conference on Computer Vision, ICCV'07*, Brazil, 2007.

C9 **N. P.**, T. Corpetti and É. Mémin – Dynamically consistent optical flow estimation – *IEEE International Conference on Computer Vision, ICCV'07*, Brazil, 2007.

C8 A. Szantai, A. Cuzol, P. Héas, **N. P.** , É. Mémin, B. Wieneke, L. Alvarez, F. Becker and P. Lopes – Comparison of MSG atmospheric motion vector fields produced by different methods – *EUMETSAT/AMS Conference*, Netherlands, 2007.

C7 P. Héas, **N. P.**, É. Mémin and A. Szantai – Motion estimation of 2D atmospheric layers from satellite image sequences – *EUMETSAT/AMS Conference*, Netherlands, 2007.

C6 **N. P.**, P. Héas and É. Mémin – Motion estimation of 2D atmospheric layers with variational assimilation techniques – *EUMETSAT/AMS Conference*, Netherlands, 2007.

C5 T. Corpetti, **N. P.** and É. Mémin – Dense estimation of motion fields on Meteosat Second Generation images using a dynamical consistency – *IEEE Int. Geoscience and Remote Sensing Symp, IGARSS '07*, Spain, 2007.

C4 **N. P.** and É. Mémin – A variational framework for spatio-temporal smoothing of fluid motions – *Scale Space and Variational Methods, SSVM'07*, Italy, 2007.

C3 P. Héas, É. Mémin and **N. P.** – A consistent spatio-temporal motion estimator for atmospheric layers – *Scale Space and Variational Methods, SSVM'07*, Italy, 2007.

C2 P. Héas, É. Mémin and **N. P.** – Dense estimation of layer motions in the atmosphere – *International Conference on Pattern Recognition, ICPR'06*, Hong-Kong, 2006.

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