CV 2025, Laurent D. COHEN

Directeur de Recherche au CNRS
CEREMADE, UMR CNRS 7534, Université Paris-Dauphine PSL
Cohen@ceremade.dauphine.fr http://www.ceremade.dauphine.fr/~cohen

MATHEMATIQUES et ANALYSE d'IMAGES: MODÈLES DÉFORMABLES, EDP, MÉTHODES GÉODÉSIQUES et MACHINE LEARNING

Le CEREMADE est structuré en 3 groupes thématiques sans qu'il n'y ait d'équipes formelles. Depuis mon arrivée au CEREMADE en 1990, j'ai dirigé mon équipe au sein du groupe Analyse, en toute autonomie, aussi bien scientifique que financière, à l'aide de nombreux contrats industriels et ANR.

Sur la période d'évaluation, et pour les années à venir, la direction principale de recherches se situe dans l'utilisation de diverses métriques de Finsler pour le calcul de lignes géodésiques et de cartes de distance par propagation de front pour la segmentation d'objets ou de structures tubulaires dans des images. Ceci a permis de redéfinir de nombreux modèles de contours actifs à l'aide de géodésiques et d'astuces mathématiques, avec l'avantage de trouver un minimum global de l'énergie et d'avoir des méthodes rapides de fast marching. Les exemples les plus importants sont la pénalisation de la courbure, les termes régions, les termes d'alignement avec un champ de vecteurs, les contraintes géométriques sur la courbure, comme la recherche de régions convexes.

Parallèlement à cela, un deuxième axe principal porte sur les méthodes de réseaux de neurones dans un cadre hybride en les combinant avec des méthodes classiques, soit géodésiques, soit variationnelles, par exemple la représentation de formes 3D ou la définition de métriques par apprentissage.

Ce document comprend:

- un curriculum vitae
- une liste des publications (production scientifique). Des liens vers les articles sont disponibles depuis ma page:
  https://www.ceremade.dauphine.fr/~cohen/index.php?static5/publis

1 Curriculum Vitae

42 ans d'expérience comme Chercheur ou Ingénieur de Recherche dans divers domaines des Mathématiques Appliquées et de l'Informatique.
62 ans, Français. Marié, 3 enfants (les 3 sont étudiants).

ETUDES. DIPLOMES :

Juin 1979: Baccalauréat C, Mention B.
1979-1981: Classes préparatoires aux Grandes Ecoles au Lycée Louis-le-Grand à Paris.
1981-1985: Elève de **l'Ecole Normale Supérieure** (45 rue d'**Ulm**, Paris).
Juin 1982: Maîtrise de Mathématiques, Mention TB, à Paris VI.
Juin 1983: DEA d'Analyse Numérique, Mention TB, à Paris VI.
Juillet 1983: reçu **Major à l'Agrégation** de Mathématiques.
1983-1986: Doctorat de Mathématiques sous la direction du Pr H. BREZIS à Paris VI. Jury composé de MM. H. Brezis, P. Baras, H. Berestycki et P. Ciarlet.
Juin 1985: DEA d'Intelligence Artificielle et Reconnaissance des Formes à Paris VI
1988-1990: Second Doctorat en Informatique à Paris XI- Orsay, Jury composé de MM. N. Ayache, R. Azencott, A. Gagalowicz, H. Maitre et C. Puech.
1995: Habilitation à Diriger des Recherches à Paris-Dauphine, Jury composé de J.-M. Morel, P. Cinquin, D. Terzopoulos, N. Ayache, R. Azencott, M. Brady, P.-L. Lions.

RECHERCHE et ENSEIGNEMENT :

CNRS: Directeur de Recherche 1ère classe au CEREMADE (UMR 7534, Université Paris-Dauphine, PSL, dirigé par M. Lewin), dirige, au sein du groupe Analyse, l'équipe Mathématiques et Analyse d'Images sur les applications des méthodes géodésiques, EDP et Machine Learning au traitement d'images (CR1 Depuis Janvier 1990, DR2 depuis Octobre 1998, DR1 depuis Octobre 2006).
Direction de 29 thésards (25 soutenances entre 1992 et 2021, 3 en 2024, 1 en cours) et de 36 stagiaires de DEA/Master.
Titulaire d'une Chaire PRAIRIE de 2019 à 2023, (PaRis AI Research InstitutE), l'un des 4 Instituts Interdisciplinaires d'Intelligence Artificielle, (ou 3IAs).
GDR MIA (Mathématiques de l'Imagerie et de ses Applications, précédemment Mathématiques des systemes perceptifs et cognitifs): Directeur de 2003 à 2008, Co-directeur de 2009 à 2012, membre du comité de direction de 2013 à 2016 et membre du comité scientifique de 2017 à 2022. Organisation de 11 journées thématiques, 5 séminaires et 11 colloques internationaux depuis 1996 dans ce cadre.
Depuis le début de carrière : Plus de 300 Publications, la plupart internationales, dont 106 articles de journaux internationaux (principaux: 7 International Journal of Computer Vision, 8 Journal of Mathematical Imaging and Vision, 7 Computer Vision and Image Understanding, 9 IEEE Transactions on PAMI/TIP/TMI, 2 Medical Image Analysis), ouvrages ou chapitres de livres, 190 proceedings [1] dans des conférences internationales avec comité de lecture (principales: 5 ICCV, IEEE International Conference on Computer Vision, 10 ECCV, European Conference on Computer Vision, 10 CVPR, IEEE

[1] Il est à noter que dans le domaine du traitement d'images, les actes de conférences internationales sélectives sont souvent préférés aux publications dans des journaux scientifiques, et leur sont de valeur similaire.

Computer Vision and Pattern Recognition, 9 ICPR, IEEE International Conference on Pattern Recognition, 9 ICIP, IEEE International Conference on Image Processing, 13 ISBI, IEEE International Symposium on Biomedical Imaging, 22 autres congrès IEEE, 7 MICCAI, International Conference on Medical Image Computing and Computer Assisted Intervention, 21 SSVM, Scale Space and Variational Methods, 10 EMMCVPR, Energy Minimization Methods in Computer Vision and Pattern Recognition) et 7 brevets.

Plus de 70 conférences invitées ou keynotes dans des congrès, internationaux pour la plupart, 77 séminaires dans un cadre universitaire, la moitié dans des universités étrangères, 20 séminaires dans un cadre industriel en France ou à l'étranger.

Collaborations académiques: INRIA Sophia, ENS Ulm (Physique et Biologie), Laboratoire Langevin, Laboratoire d'imagerie biomédicale (LIB), UPS Toulouse, Technion, Georgiatech, UCLA, Berkeley, University of Pennsylvania, NYU, CSIRO, Australie, Liverpool, Hong Kong, Shandong AI Institute, Southeast University Nanjing.

Collaborations hospitalières : Mayo Clinic, Hôpital de Créteil (Ophtalmologie), Hôpital de Kremlin-Bicêtre (Cardiologie), Creatis (Radiologie), University College London Hospital (Heart Hospital), Institut de la Vision (Quinze-Vingts).

Collaborations industrielles (Négociation, réalisation et gestion de contrats): Philips Medical Systems, Smiths Detection, CEA, Matra/EADS, ELF,

Participation au pôle de compétitivité Cap Digital, Membre du Projet Infomagic.

Membre de 5 projets ANR depuis 2005 (dont 2 comme responsable d'équipe, et 1 comme coordinateur), ce qui a permis d'accueillir 8 postdocs.

Enseignement: Cours de Master 2 à Dauphine (depuis 1992) sur les EDP et méthodes variationnelles en analyse d'images.

Cours de Master 2 MVA à l'ENS Cachan/Paris-Saclay (depuis 1996) sur les modèles déformables et méthodes géodésiques et applications en imagerie biomédicale. Responsable à Dauphine pour le Master 2 MVA.

Prix/Distinctions: Prix CS 2002 en Traitement du Signal et Image, Juin 2002, décerné par la société CS Communications et Systèmes, la SMAI et l'ASTI.

Prix Taylor & Francis (editeur): "**2006 prize** for Outstanding innovation in computer methods in biomechanics & biomedical engineering."

Lauréat 2009 du Grand Prix de l'Académie des Sciences: de la Fondation d'entreprise EADS (sciences de l'information) (voir
http://www.ceremade.dauphine.fr/∼cohen/GP09.html)

IEEE Fellow 2010 for contributions to computer vision technology for medical imaging. IEEE Senior Member 1996.

Prix du meilleur papier pour les congrès RFIA 2004, CVBIA 2005, Vipimage 2011, CMBBE 2016, VISIGRAPP 2023 et Journal CMBBE 2013.

Mes 2 thésards J.-B. Fiot et R. Prevost ont obtenu tous les 2 le prix de la meilleure thèse de la fondation Dauphine. Mon thésard R. Prevost a obtenu le prix de la meilleure thèse AMIES, Agence pour les Mathématiques en Interaction avec l'Entreprise et la Société, et le prix de thèse AFRIF.

Activités Editoriales et d'Expertise: Membre du comité éditorial du *Journal of Mathematical Imaging and Vision* (Springer), de Janvier 1996 à Décembre 2015, de *Medical Image Analysis,* (Elsevier), depuis sa création en Mars 1996 jusqu'en Décembre 2007, de *Machine Vision and Applications* (Springer), de Octobre 2004 à Mars 2011, de *International Journal for Computational Vision and Biomechanics (IJCV&B)* depuis sa création

en Janvier 2008, de *Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization* (Taylor and Francis), depuis sa création en Mars 2013, et de *Journal of Visusal Communication and Image Representation* (Elsevier), de Juin 2015 à Janvier 2019.

Guest Editor pour 6 numéros spéciaux sur "Mathematics and Image Analysis" du Journal of Mathematical Imaging and Vision, Mai 2001, début 2004, 2006, 2009, 2011, et 2014 et 1 numéro de IRBM.

Membre des comités de programme pour plus de 70 congrès internationaux, dont les plus importants du domaine, comme *IEEE International Conference on Computer Vision ICCV*, *European Conference on Computer Vision ECCV*, *IEEE Computer Vision and Pattern Recognition CVPR*, *International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, etc..

Membre des Comités de programme et d'**organisation** des 11 colloques *Mathématiques et reconnaissance de formes*, Luminy, Novembre 1997 et Avril 1999, *Mathematics and Image Analysis, MIA'00*, Paris, Sept. 2000, *MIA'02*, Sept. 2002, *MIA'04*, Sept. 2004 (**organisateur principal**, 200 participants), *MIA'06*, Sept. 2006 (**organisateur principal**, 250 participants), *MIA'09*, Déc. 2009, *MIA'12*, Jan. 2012, et *FGMIA'14*, Jan. 2014, FGMIA'16, Jan. 2016 à Paris et MIA'18, Jan. 2018 à Berlin.

Liste de THEMES de RECHERCHE abordés: Traitement d'Images. Modèles déformables élastiques. Méthodes variationnelles. Equations aux dérivées partielles. Machine Learning, Deep Learning, Reconstruction de courbes et surfaces. Maillage de surfaces. Reconnaissance des Formes.

Indexation d'images par le contenu. Suivi du mouvement et Mise en correspondance. Restauration d'images. Compression d'images. Synthèse d'images. Théorie de l'information (Compression de données et cryptographie).

PARCOURS: Après une formation plutôt théorique aux Equations aux dérivées partielles, puis quelques années d'expérience chez Schlumberger et à l'INRIA, principalement en Traitement d'images, ayant conduit à deux DEA et deux doctorats, j'ai combiné ces deux domaines en me spécialisant dans les EDP et méthodes variationnelles en Analyse d'images. Mes préoccupations ont le plus souvent traité aussi bien la formulation mathématique des problèmes et leur résolution que le côté algorithmique et la mise en oeuvre effective de l'application en imagerie médicale, aérienne ou industrielle (notamment avec Schlumberger, CEA, Matra, Philips). Cette combinaison de méthodes mathématiques et de traitement d'images a été particulierement utile pour l'extraction ou la reconstruction d'objets déformables dans des images ou séquences d'images 2D ou 3D biomédicales. Nous avons été pionniers dans ce domaine, au début des années 1990, alors que l'imagerie médicale était à ses débuts. Depuis une vingtaine d'années une grande partie de mes travaux portent sur les chemins minimaux et lignes géodésiques, avec plusieurs brevets déposés concernant en particulier la recherche de ligne centrale d'un vaisseau et l'endoscopie virtuelle. Selon Google Scholar (Cohen L ou LD), deux de mes articles sur le modèle déformable Ballon et sur les surfaces déformables, totalisent 3745 et 2402 citations, et 50 articles totalisent plus de 50 citations, un h-index de 50. Mes publications totalisent environ 16000 citations.

2 Production scientifique de Laurent D. Cohen

Des liens vers les articles sont disponibles depuis ma page:
https://www.ceremade.dauphine.fr/~cohen/index.php?static5/publis

Articles de Revues Internationales à comité de lecture.

[1] Laurent D. Cohen. Etude de quelques problèmes semi-linéaires paraboliques et elliptiques. PhD thesis, Université Paris 6, 1986.

[2] Laurent D. Cohen. Etude des modèles de contours actifs et d'autres techniques de traitement d'Images. 2nd PhD thesis, Université Paris-Sud Orsay, 1990.

[3] Laurent D. Cohen. Méthodes Variationnelles pour le Traitement d'images. Université Paris Dauphine, 1995. Mémoire d'Habilitation à diriger des recherches. Accompagné des 10 publications les plus significatives des années 1988-1995.

Articles de Revues Internationales à comité de lecture.

[4] P. Baras and Laurent D. Cohen. Explosion totale après T_{max} de la solution d'une équation de la chaleur non linéaire. *Comptes Rendus de l' Académie des Sciences Sér.I*, 300(10), 1985.

[5] P. Baras and Laurent D. Cohen. Complete blow-up after T_{max} for the solution of a semilinear heat equation. *Journal of Functional Analysis*, 71(1):142–174, March 1987.

[6] Laurent D. Cohen. On active contour models and balloons. *Computer Vision, Graphics, and Image Processing: Image Understanding*, 53(2):211–218, March 1991. Cet article a été intégré dans un livre collectant les **meilleurs articles des 10 dernieres années** sur le sujet.

[7] Isaac Cohen, Laurent D. Cohen, and Nicholas Ayache. Using deformable surfaces to segment 3-D images and infer differential structures. *Computer Vision, Graphics, and Image Processing: Image Understanding*, 56(2):242–263, September 1992. Cet article a été intégré dans un livre collectant les **meilleurs articles des 10 dernieres années** sur le sujet.

[8] Laurent D. Cohen and Isaac Cohen. Finite element methods for active contour models and balloons for 2-D and 3-D images. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, PAMI-15(11):1131-1147, November 1993.

[9] Isaac Cohen and Laurent D. Cohen. A hybrid hyperquadric model for 2-D and 3-D data fitting. *International Journal on Computer Vision and Image Understanding*, 63(3):527–541, May 1996.

[10] Laurent D. Cohen. Auxiliary variables and two-step iterative algorithms in computer vision problems. *Journal of Mathematical Imaging and Vision*, 6(1):61–86, January 1996.

[11] E. Bardinet, Laurent D. Cohen, and N. Ayache. Tracking and motion analysis of the left ventricle with deformable superquadrics. *MEDIA, Medical Image Analysis, an international journal on Computer Vision, Visualisation and Image Guided Intervention in Medicine*, 1(2):129–149, 1996. Accompagné d'une vidéo dans la version CD du journal.

[12] E. Bardinet, Laurent D. Cohen, and N. Ayache. Suivi de données médicales 3D avec un modéle paramétrique déformable. *Journal TSI, Technique et Science Informatiques*, 16(3/97):355-381, Mars 1997.

[13] E. Bardinet, Laurent D. Cohen, and N. Ayache. A parametric deformable model to fit unstructured 3D data. *International Journal on Computer Vision and Image Understanding*, 71(1):39–54, July 1998.

[14] Laurent D. Cohen and R. Kimmel. Global minimum for active contour models: A minimal path approach. *International Journal of Computer Vision*, 24(1):57-78, August 1997.

[15] Denis Pellerin, Laurent D. Cohen, Fabrice Larrazet, Floris Pajany, Serge Witchitz, and Colette Veyrat. Preejectional left ventricular wall motion in normal subjects using doppler tissue imaging and correlation with ejection fraction. In *American Journal of Cardiology*, volume 80, pages 601–607, September 1997.

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[17] C Veyrat, D Pellerin, L Cohen, F Larrazet, C Fournier, and S Witchitz. Dynamique pariétale prééjectionnelle du ventricule gauche par imagerie doppler tissulaire. *Archives des Maladies du Coeur et des Vaisseaux*, 91(1):29–38, 1998.

[18] Pellerin D, Berdeaux A, Cohen L, Giudicelli JF, Witchitz S., and Veyrat C. Comparison of two myocardial velocity gradient assessment methods during dobutamine infusion using doppler myocardial imaging. *Journal of the American Society of Echocardiography*, 12(1):22–31, January 1999.

[19] Veyrat C, Pellerin D, Cohen L, Larrazet F, Extramiana F, and Witchitz S. Spectral, one-or two-dimensional tissue velocity doppler imaging: which to choose? *Cardiology*, 9(1):9–18, 2000.

[20] T. Deschamps and L.D. Cohen. Path Extraction in 3D Medical Images for Virtual Endoscopy. *Journal of Computer Aided Surgery*, 5(5), 2000.

[21] M. Lefebure and L. D. Cohen. Image registration, optical flow and local rigidity. *Journal of Mathematical Imaging and Vision*, 14(2), March 2001. CEREMADE TR 0102, Jan 2001.

[22] L. D. Cohen. Multiple contour finding and perceptual grouping using minimal paths. *Journal of Mathematical Imaging and Vision*, 14(3), May 2001. CEREMADE TR 0101, Jan 2001.

[23] Fabrice Larrazet, Denis Pellerin, A Prigent, D Daou, Laurent D Cohen and Colette Veyrat Quantitative analysis of hibernating myocardium by dobutamine tissue Doppler echocardiography. In *American Journal of Cardiology*, volume 88(4), pages 418-22, 2001.

[24] Zakaria Ben Sbeh, Laurent D. Cohen, Gérard Mimoun, and Gabriel Coscas. A new approach of geodesic reconstruction for drusen segmentation in eye fundus images. *IEEE Transactions on Medical Imaging*, December 2001.

[25] T. Deschamps and L.D. Cohen. Fast extraction of minimal paths in 3D images and application to virtual endoscopy. *MEDIA, Medical Image Analysis, an international journal of Computer Vision, Visualisation and Image Guided Intervention in Medicine*, 5(4):281–299, December 2001. Video in the web version of the journal.

[26] Frederic Richard and Laurent D. Cohen. A new image registration technique with free boundary constraints: application to mammographs. *International Journal on Computer Vision and Image Understanding*, Special Issue of on Nonrigid Image Registration, Volume 89, Issues 2-3, Pages 166-196 February - March 2003.

[27] Denis Pellerin, Fabrice Larrazet, Laurent D Cohen, Serge Witchitz and Colette Veyrat. Myocardial time intervals preceding left ventricular filling in chronic coronary artery disease: value of a decreased septal ejection time. In *International Journal of Cardiology*, volume 89(1), pages 33-44, May 2003.

[28] Denis Pellerin, Laurent D Cohen, Fabrice Larrazet, Fabrice Extramiana, Serge Witchitz and Colette Veyrat. New insights into septal anterior wall motion velocities at end-systole in normal and hypertrophied left ventricles. In *European journal of echocardiography*, volume 4(2), pages 108-18, 2003.

[29] Colette Veyrat, Denis Pellerin, Fabrice Larrazet, Laurent D Cohen, and Serge Witchitz. Dynamic myocardial velocity changes between phases of the cardiac cycle. In *Ultrasound in medicine & biology*, volume 29(8), pages 1077-84, August 2003.

[30] Colette Veyrat, Denis Pellerin, Fabrice Larrazet, and Laurent D Cohen. Clinical relevancy of the myocardial velocity gradient: limitations of a binary response. In *Journal of the American Society of Echocardiography*, volume 16(12), pages 1217-25, December 2003.

[31] Laurent D. Cohen. Chemins minimaux et modèles déformables en analyse d'images. *Traitement du Signal*, Volume 20 numéro 3, Numéro spécial: Le traitement du signal à l'aube du XXIème siècle, Pages 225–241, Décembre 2003.

[32] Colette Veyrat, Fabrice Larrazet, Laurent D Cohen, François Laborde and Denis Pellerin A new Doppler tissue ratio to revisit systole: the pre-ejectional isovolumic to ejectional velocity ratio-application to aging. In *Journal of the American Society of Echocardiography*, volume 17(12), pages 1251-8, December 2004.

[33] Pablo Arbelaez and Laurent D. Cohen. Energy Partitions and Image Segmentation. *Journal of Mathematical Imaging and Vision*, 20(1-2):43–57, January - March 2004.

[34] Pablo Arbelaez and Laurent D. Cohen Segmentation d'Images Couleur par partitions de Voronoi. *Traitement du Signal*, Volume 21 numéro 5, Numéro spécial: L'image numérique couleur, Pages 407-421, Février 2005.

[35] Colette Veyrat, Fabrice Larrazet, Laurent D Cohen, François Laborde and Denis Pellerin Detection of prominent left anterior descending coronary artery stenosis for patients with stable angina using Doppler tissue echocardiography. In *Journal of the American Society of Echocardiography*, volume 18(8), pages 821-9, August 2005.

[36] Stephane Bonneau, Maxime Dahan and Laurent D. Cohen. Single Quantum Dot tracking based on perceptual grouping using minimal paths in a spatio-temporal volume. *IEEE Transactions on Image Processing, special issue on Molecular and Cellular Imaging*, 14(9):1384–1395, September 2005.

[37] Roberto Ardon and Laurent D. Cohen. Fast Constrained Surface Extraction by Minimal Paths. *International Journal of Computer Vision*, Special Issue on Variational and Level Set Methods in Computer Vision (VLSM 2003), 69(1):127–136, August 2006.

[38] Gabriel Peyre and Laurent D. Cohen. Geodesic Remeshing Using Front Propagation *International Journal of Computer Vision*, Special Issue on Variational and Level Set Methods in Computer Vision (VLSM 2003), 69(1):145–156, August 2006.

[39] Pablo Arbelaez and Laurent D. Cohen. A Metric Approach to Vector-Valued Image Segmentation *International Journal of Computer Vision*, Special Issue on Variational and Level Set Methods in Computer Vision (VLSM 2003), 69(1):119–126, August 2006.

[40] Roberto Ardon, Laurent D. Cohen and Anthony Yezzi. Fast surface segmentation guided by user input using implicit extension of minimal paths. *Journal of Mathematical Imaging and Vision*, 25(3):289–305, October 2006.

[41] Hua Li, Anthony Yezzi and Laurent D. Cohen. Fast 3D Brain Segmentation Using Dual-front Active Contours With Optional User-Interaction *International Journal of Biomedical Imaging*, Special issue on Recent Advances in Mathematical Methods for the Analysis of Biomedical Images. 2006.

[42] Roberto Ardon, Laurent D. Cohen and Anthony Yezzi. A new implicit method for surface segmentation by minimal paths in 3D images. *Applied Mathematics and Optimization*, 55(2):127-144, March 2007.

[43] Laurent D. Cohen and Thomas Deschamps. Segmentation of 3D tubular objects with adaptive front propagation and minimal tree extraction for 3D medical imaging. *Computer Methods in Biomechanics and Biomedical Engineering*, 10(4):289 - 305, August 2007.

[44] Gabriel Peyre and Laurent D. Cohen. Heuristically Driven Front Propagation for Fast Geodesic Extraction. *International Journal for Computational Vision and Biomechanics*, 1(1), 55–67, Jan-June 2008.

[45] Fethallah Benmansour and Laurent D. Cohen Fast Object Segmentation by Growing Minimal Paths from a Single Point on 2D or 3D Images *Journal of Mathematical Imaging and Vision*. 33(2):209–221, February 2009.

[46] Julien Mille and Fetallah Benmansour and Laurent D. Cohen Carotid Lumen Segmentation Based on Tubular Anisotropy and Contours Without Edges in *The MIDAS Journal*, Special issue on Carotid Lumen Segmentation and Stenosis Grading (MICCAI 2009 Grand Challenge III), July 2009.

[47] N. Barreira and M. G. Penedo and Laurent Cohen and M. Ortega. Topological Active Volumes: a Topology-Adaptive Deformable Model for Volume Segmentation Pattern Recognition, 43(1):255-266, January 2010.

[48] Fethallah Benmansour and Laurent D. Cohen. Tubular Structure Segmentation Based on Minimal Path Method and Anisotropic Enhancement in *International Journal of Computer Vision*, April 2011, Volume 92, Number 2, Pages 192-210.

[49] Gabriel Peyre and Sebastien Bougleux and Laurent D. Cohen. Non-local Regularization of Inverse Problems *AIMS journal: Inverse Problems and Imaging*, vol. 5(2), pp. 511-530, May 2011.

[50] Adrian Ion and N. M. Artner and Gabriel Peyre and Walter G. Kropatsch and Laurent D. Cohen. Matching 2D and 3D Articulated Shapes using Eccentricity. *CVIU, Computer Vision and Image Understanding*, vol. 115, 6 (June 2011) pp. 817-834

[51] Didier Auroux, Laurent D. Cohen, and Mohamed Masmoudi Contour Detection and Completion for Inpainting and Segmentation Based on Topological Gradient and Fast Marching Algorithms in *International Journal of Biomedical Imaging*, Special Issue on Mathematical Methods for Images and Surfaces 2011, Volume 2011, Pages 1-20. doi:10.1155/2011/592924.

[52] Youssef Rouchdy, Laurent D. Cohen, Olivier Pascual and Alain Bessis Minimal path techniques for automatic extraction of microglia extensions in *International Journal for Computational Vision and Biomechanics (IJCV&B)*, 2011

[53] Miyoun Jung, Gabriel Peyre and Laurent D. Cohen. Non-local Active Contours. In *SIAM Journal on Imaging Sciences*, 5(3):1022-1054, September 2012.

[54] Youssef Rouchdy and Laurent D. Cohen. Geodesic voting methods: overview, extensions, and application to blood vessel segmentation. In *Computer Methods in Biomechanics and Biomedical Engineering: Imaging and Visualization*, 1(2):79-88, June 2013.

[55] Chen Da, Mingqiang Yang and Laurent D. Cohen. Global Minimum For A variant Mumford-Shah Model with Application to medical image Segmentation In *Computer Methods in Biomechanics and Biomedical Engineering: Imaging and Visualization*, 1(1):48-60, March 2013. (**Best Paper Award**)

[56] Jean-Baptiste Fiot, Laurent D. Cohen, Parnesh Raniga and Jurgen Fripp. Efficicient brain lesion segmentation using multi-modality tissue-based feature selection and Support Vector Machines. In *International Journal for Numerical Methods in Biomedical Engineering*, 29(9):905-915, September 2013.

[57] Youssef Rouchdy and Laurent D. Cohen. Geodesic voting for the automatic extraction of tree structures. Methods and applications. In *Computer Vision and Image Understanding*, 117(10):1453-1467, October 2013.

[58] Jean-Baptiste Fiot, Hugo Raguet, Laurent Risser, Laurent D. Cohen, Jurgen Fripp and François-Xavier Vialard, ADNI. Longitudinal deformation models, spatial regularizations and learning strategies to quantify Alzheimer's disease progression. In *NeuroImage: Clinical* , 4:718-729, May 2014.

[59] Julien Mille, Sébastien Bougleux and Laurent D. Cohen. Combination of piecewise-geodesic paths for interactive segmentation. in *International Journal of Computer Vision*, 112(1):1-22, March 2015.

[60] Fang Yang and Laurent D. Cohen. Geodesic Distance and Curves Through Isotropic and Anisotropic Heat Equations on Images and Surfaces. in *Journal of Mathematical Imaging and Vision*, Special Issue on Shape Analysis Beyond the Eikonal Equation, 55(2):210-228, June 2016.

[61] Da Chen, Jean-Marie Mirebeau and Laurent D. Cohen. Vessel Tree Extraction using Radius-Lifted Keypoints Searching Scheme and Anisotropic Fast Marching Method. in *Journal of Algorithms and Computational Technology*, vol. 10, n°4, p. 224-234 2016.

[62] Da Chen, Jean-Marie Mirebeau and Laurent D. Cohen. Global Minimum For A Finsler Elastica Minimal Path Approach. in *International Journal of Computer Vision*, vol. 122, n°3, p. 458-483, 2017.

[63] Qi-Chong Tian and Laurent D. Cohen. Histogram-based Color Transfer for Image Stitching. in *Journal of Imaging, Special Issue on Color Image Processing*, 3(3), 38, September 2017.

[64] Da Chen and Laurent D. Cohen. Fast Asymmetric Fronts Propagation for Image Segmentation. in *Journal of Mathematical Imaging and Vision*, Volume 60 Issue 6, July 2018 Pages 766-783.

[65] Da Chen, Jiong Zhang and Laurent D. Cohen. Minimal Paths for Tubular Structure Segmentation with Coherence Penalty and Adaptive Anisotropy. in *IEEE Trans. on Image Processing*, Volume 28 Issue 3, Pages 1271 - 1284, March 2019.

[66] Qi-Chong Tian and Laurent D. Cohen. A variational-based fusion model for nonuniform illumination image enhancement via contrast optimization and color correction. in *Signal Processing*, Volume 153, Pages 210-220, December 2018.

[67] Li Liu, Da Chen, Laurent D. Cohen, Jiasong Wu, Michel Paques and Huazhong Shu. Anisotropic tubular minimal path model with fast marching front freezing scheme. in *Pattern Recognition*, Volume 104, August 2020 Pages 766-783. 10.1016/j.patcog.2020.107349 ; hal-02996912

[68] Da Chen, Jack Spencer, Jean-Marie Mirebeau, Ke Chen, Ming-Lei Shu and Laurent D. Cohen. A Generalized Asymmetric Dual-front Model for Active Contours and Image Segmentation. in *IEEE Trans. on Image Processing*, Volume 30, May 2021, Pages 5056-5071. 10.1109/TIP.2021.3078102 ; hal-03425885

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[79] Laurent D. Cohen and Isaac Cohen. Deformable models for medical images using finite elements & balloons. Conférence invitée. In *Actes Ecoles CEA - EDF - INRIA; Problèmes Non Linéaires Appliqués: Modélisations Mathématiques pour le traitement d'images*, pages 180–200, Rocquencourt, France, March 1992.

[80] Laurent D. Cohen. Deformable surfaces and parametric models to fit and track 3D data. Conférence invitée à la session 3D shape Recovery and Analysis. In *IEEE International Conference on Systems, Man and Cybernetics*, Beijing, China, Oct 1996.

[81] Laurent D. Cohen and R. Kimmel. Finding the global minimum for active contours using a level set approach. Conférence invitée à la session Partial Differential Equations. In *IEEE International Conference on Image Processing (ICIP'96)*, pages I:473–476, Lausanne, Suisse, September 1996.

[82] Laurent D. Cohen. Modèles déformables. Conférence invitée. In *Actes de l'Ecole Thématique ISIS*, pages 1–20, Marly le Roy, Avril 1997.

[83] Laurent D. Cohen and Thomas Deschamps. Minimal Paths for 3D medical images and Virtual endoscopy. Conférence invitée. In *Mathematics and Image Analysis, MIA'00*, Paris, September 2000.

[84] Laurent D. Cohen and Benjamin Mauroy. Multiple minimal paths and perceptual grouping. Conférence invitée. In *Mathematics and Image Analysis, MIA'00*, Paris, September 2000.

[85] Laurent D. Cohen. Fast marching methods for minimal paths in 2D and 3D images. Conférence plénière invitée. In *Proc. Workshop on Hamilton-Jacobi Bellman equations and their applications.*, Paris, France, October 2000.

[86] Laurent D. Cohen. Chemins minimaux et Modèles Déformables en Analyse d'images. Conférence plénière invitée. In *Proc. Journées d'études SEE: Le Traitement d'Images à l'Aube Du XXIème Siecle.*, Paris, France, Mars 2002.

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[88] Laurent D. Cohen. Fast Marching and Front Propagation methods in Image Analysis. Conférence invitée. In *Fifth European Conference on Elliptic and Parabolic Problems*, Gaeta, Italy, June 2004.

[89] Laurent D. Cohen. Fast Marching and Deformable Models in Image Analysis. Conférence invitée. In *IFIP workshop on shape optimization and control*, Lisbon, Portugal, May 2004.

[90] Laurent D. Cohen and Roberto Ardon. Surface extraction by minimal paths, applications in 3D Medical Images. Conférence invitée. In *Mathematics and Image Analysis, MIA'04*, Paris, September 2004.

[91] Laurent D. Cohen. Minimal Paths and Deformable Models for Image Analysis. Conférence invitée. In *76. Jahrestagung der Gesellschaft fur Angewandte Mathematik und Mechanik e.V., GAMM05*, Université du Luxembourg, 28 Mars - 01 April 2005.

[92] Laurent D. Cohen Minimal Paths and Deformable Models for Image Analysis. Conférence invitée. In *Mini-invasive Procedures in Medicine and Surgery: Mathematical and Numerical Challenges*, Centre de recherches mathematiques, Universite de Montreal, Canada, May 16-27, 2005.

[93] Laurent D. Cohen and Roberto Ardon. A level set method for constrained object segmentation. Conférence invitée. In *22nd IFIP TC 7 Conference on System Modeling and Optimization, special session on shape analysis and optimization*, Turin, Italy, July 18-22, 2005.

[94] Laurent D. Cohen. Surface Segmentation and Remeshing using front propagation in Medical Images. Conférence invitée. In *Actes Ecoles CEA - EDF - INRIA; Numerical Simulations of Blood Flows*, December 6-9, 2005, Rocquencourt, France.

[95] Laurent D. Cohen. Deformable models for medical image Analysis. Conférence invitée. In *Israel-France Meeting in Medical Imaging*, Hadassah University Hospital, Jerusalem, Israel, February 27-March 1st, 2006.

[96] Laurent D. Cohen. Surface Segmentation using Front Propagation in Medical Images. Conférence invitée. In *7th international symposium on computer methods in biomechanics and biomedical engineering, special session on Computer Assisted Surgery and Planning*, Antibes, March 22-25, 2006.

[97] Laurent D. Cohen. Invited to organize the minisymposium on Minimal Paths and Fast Marching Methods in Image Analysis. In *2006 SIAM Conference on Imaging Science.*, Minneapolis, Minnesota, USA, 15-17 may, 2006.

[98] Laurent D. Cohen. Minimal Paths and Fast Marching Methods for Surface Segmentation and Meshing. In *Curves and Surfaces*, invited to minisymposium on Numerical geometry of images, Avignon, June 29- July 5, 2006.

[99] Laurent D. Cohen and Gabriel Peyre. Exact and Heuristically Driven Geodesic Computations. In *Curves and Surfaces*, invited to minisymposium on Mesh generation, Avignon, June 29- July 5, 2006.

[100] Laurent D. Cohen. Fast Marching and Minimal paths for Curve and Surface Segmentation. Conférence invitée. In *Journées de Metz 2007*, PDE and variational methods in image analysis, Metz, May 3-4-5, 2007.

[101] Laurent D. Cohen. Front Propagation and Minimal paths for Image Segmentation. Conférence invitée. In *RIMA'07*, Rencontres MIP-LAMSIN en Imagerie Mathématique, Institut de Mathḿatiques de Toulouse, France, 11 et 12 Juin 2007.

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[103] Laurent D. Cohen. Fast Curve and Surface Segmentation by finding geodesics. Invited Keynote. Conférence invitée. In *VipIMAGE 2007*, International ECCOMAS Thematic Conference on computational vision and medical image processing, FEUP, Porto, Portugal, 17-19th October 2007.

[104] Laurent D. Cohen. Front propagation and Fast Marching for fast segmentation of objects in 2D and 3D images. Invited Keynote. Conférence invitée. In *Joint International Meeting of the AMS and Sociedade Brasileira de Matematica*, Special session on Mathematical Methods in Image Processing, IMPA, Rio de Janeiro, Brazil, June 4-7th 2008.

[105] Laurent D. Cohen. Curve and Surface Segmentation Using Minimal Paths. In *2008 SIAM Annual Meeting.* Invited to Minisymposium on Segmentation and Data Mining, San Diego, California, USA, July 7-11, 2008.

[106] Laurent D. Cohen. Curve and Surface Segmentation using Fast Marching approaches for medical images. Conférence invitée. In *Imaging and Measurements in Biomedical Engineering* Paris, France October 2-3, 2008.

[107] Laurent D. Cohen. Lignes géodésiques et segmentation d'images. Conférence invitée. In *SMAI-AFA Approximation, Modélisation Géométrique et Applications.* CIRM, Luminy, France, 24-28 novembre 2008.

[108] Laurent D. Cohen. Lignes géodésiques et analyse d'images. Conférence invitée. In *Séminaire de Mathématiques appliquées du Collège de France*, Paris, France 16 Janvier 2009.

[109] Laurent D. Cohen. Lignes géodésiques et analyse d'images médicales. Conférence invitée. In *1ère Journée de la Recherche à Dauphine* Paris, France 12 mai 2009.

[110] Laurent D. Cohen. Modèles Déformables et Chemins Minimaux, Applications en analyse d'images médicales. Conférence invitée. In *Cérémonie SMAI en l'honneur des lauréats des prix de Mathématiques Appliquées de l'Académie des Sciences* IHP, Paris, France, 18 Novembre 2009.

[111] Laurent D. Cohen. Invited to organize the minisymposium on Anisotropic Fast Marching and Applications. In *2010 SIAM Conference on Imaging Science.*, Chicago, Illinois, USA, 14 April 2010.

[112] Laurent D. Cohen. Extraction of tubular and tree structures in biomedical images using minimal paths and tubular models. Conférence invitée. in *Ill-posed Problems*, Rome, Italy. November 29-30, 2010.

[113] Laurent D. Cohen. Geodesic Methods for Biomedical Image Segmentation. Keynote. in *1st Technion Computer Engineering (TCE) Conference*, Technion, Haifa, Israel. June 1-5, 2011.

[114] Laurent D. Cohen. Geodesic Methods for Biomedical Image Segmentation. Conférence invitée. in *Analytic and Geometric Methods in Medical Imaging*, Cambridge, UK. August 22-26, 2011.

[115] Laurent D. Cohen. Geodesic Voting for Image Segmentation. Conférence invitée. in *Fronts and Interfaces in Science and Technology*, bath, UK. December 13-15, 2011.

[116] Laurent D. Cohen. A Voting scheme for vessel tree segmentation. Conférence invitée. in *Retinal Imaging Treatment and Analysis meeting (RITA)*, Institut de la Vision, Paris, France, October 15, 2012.

[117] Laurent D. Cohen. Non Local Active Contours. Conférence invitée. in *Workshop on Image Processing and Reaction-Diffusion* , Jerusalem, Israel, September 11-13, 2012.

[118] Laurent D. Cohen. Non Local Active Contours. Conférence invitée. in *Workshop on Nonlocal Problems,* , Zurich, Switzerland, December 12-14, 2012.

[119] Laurent D. Cohen. Segmentation d'images vasculaires par vote géodésique. Conférence invitée. in *Journée thématique mathématiques, image et biomédecine*, Paris, France, 18 décembre 2012.

[120] Laurent D. Cohen. Extraction of tubular and tree structures in biomedical images using minimal paths and tubular models. Conférence invitée. in *Summer School and Workshop on Recent Advances in PDEs and Fluids* à *Stanford University*, Palo Alto, Californie, August 5-18, 2013.

[121] Laurent D. Cohen. Automatic segmentation of natural images with Anisotropic Fast Marching algorithm and Geodesic voting. Conférence invitée. in *Fronts and Interfaces in Science and Technology*, Madrid, Spain, December 11-13, 2013.

[122] Laurent D. Cohen. Geodesic Method for Blood Vessels and Tree Structure Segmentation. In *2014 SIAM Imaging Science Meeting.* Invited conference to Minisymposium on Detection and Analysis of Blood Vessels and Tree Shapes, Hong Kong, 12-14 May 2014.

[123] Laurent D. Cohen. Minimally Overlapping Combination of Geodesic Paths for Interactive Segmentation. Conférence invitée. In *Research Workshop on Shape and Image Modeling and Analysis (SIMA).*, Ein-Gedi, The Dead Sea, Israel, 28-31 May 2014.

[124] Laurent D. Cohen. Geodesic Methods for Biomedical Image Segmentation. Keynote. in *4th International Conference on Image Processing Theory, Tools and Applications, IPTA*, Paris, France. October 14-17, 2014.

[125] Laurent D. Cohen. Geodesic methods in Biomedical Image Analysis. Conférence invitée. In *Advanced Study School on Imaging for Medical Applications.*, Sinaia, Romania, 29 June-4 July 2015.

[126] Laurent D. Cohen. Segmentation of biomedical images using geodesic methods. Conférence invitée. In *Third International Workshop on Image Processing Techniques and Applications, incorporating Mathematical Imaging with Biomedical Applications.*, Liverpool, UK, 6-8 July 2015.

[127] Laurent D. Cohen. Segmentation of retinal images using geodesic methods. Conférence invitée. In *Computer Methods in Biomechanics and Biomedical Engineering 2015 (CMBBE 2015).*, Montreal, Canada, September 1-5 2015.

[128] Laurent D. Cohen. The Fast Marching Algorithm for Image Segmentation. Conférence invitée. In *Workshop on Algorithms and Applications (In honor of Ed Reingold's contributions on his 70th Birthday).*, Chicago, IL, USA, October 12 2015.

[129] Laurent D. Cohen. Méthodes géodésiques pour la segmentation d'images médicales,. Conférence invitée. In *Horizon Maths 2015 (Fondation Sciences Mathématiques de Paris)*, IBM Bois-Colombes, France, 14-15 Décembre 2015.

[130] Laurent D. Cohen. Geodesic curves for region-based segmentation. Conférence invitée Special Session on Image Analysis. In *2016 ICSEE International Conference on the Science of Electrical Engineering.*, Eilat, Israel, November 16-18, 2016.

[131] Laurent D. Cohen. Geodesic methods for interactive image segmentation of biomedical images. Conférence invitée. in *International Workshop for Mathematical Imaging and Digital Geometry*, Beijing, China, June 12-13, 2017.

[132] Laurent D. Cohen. Geodesic methods for interactive image segmentation of biomedical images. Conférence invitée. In *Summer School VIVABRAIN 2017 - Cerebral MR Angiography: acquisition, processing, simulation.*, Marne-La-Vallée, France, 26-29 Juin 2017.

[133] Laurent D. Cohen. Geodesic Methods for Interactive Image Segmentation of biomedical images. Conférence invitée. In *International Summer School on Imaging for Medical Applications.*, Brasov, Romania, 17-21 July 2017.

[134] Laurent D. Cohen. Geodesic Methods for Interactive Image Segmentation using Finsler metrics. Conférence invitée. in *Variational methods, new optimisation techniques and new fast numerical algorithms*, Cambridge, UK. September 4-8, 2017.

[135] Laurent D. Cohen. Invited to organize the session on Geodesic Methods with Constraints. In *3rd conference on Geometric Science of Information GSI2017.*, Paris, France, 7-9 November, 2017.

[136] Da Chen and Laurent D. Cohen. Minimal Paths and Geodesic Metrics for Image Segmentation and Tubular Structure Extraction. In *2018 SIAM Imaging Science Meeting.* Invited conference to Minisymposium on Variational Image Segmentation: Methods and Applications, Bologna, Italy, 5-8 June 2018.

[137] Laurent D. Cohen. Geodesic methods in Biomedical Image Analysis. Tutorial at *IEEE International Symposium on Biomedical Imaging (ISBI 2019)*, Venice, Italy, April 8 - 11, 2019.

[138] Laurent D. Cohen. From Active Contours to geodesic methods. Conférence invitée. In *Fourth International Workshop on Image Processing Techniques and Applications.*, Liverpool, UK, 22-23 July 2019.

[139] Laurent D. Cohen. From Active Contours to geodesic methods. Conférence invitée, Keynote. In *3rd International Symposium on Image Computing and Digital Medicine (ISICDM).*, Xi'an, China, August 24-26, 2019.

[140] Laurent D. Cohen. Geodesic methods for Biomedical Image Analysis. Tutorial at *3rd International Symposium on Image Computing and Digital Medicine (ISICDM).*, Xi'an, China, August 24-26, 2019.

[141] Laurent D. Cohen. Geodesic Methods for Interactive Image Segmentation of biomedical images. Conférence invitée. In *International Summer School on Imaging for Medical Applications.*, Bucarest, Romania, 16-20 September 2019.

[142] Laurent D. Cohen. From Active Contours to geodesic methods and back. Conférence invitée, Keynote. In *14th International Conference on Digital Image Processing (ICDIP 2022).*, Wuhan, China, May 2022.

[143] Laurent D. Cohen. Eikonal methods applied to image segmentation. In *10th International Congress on Industrial and Applied Mathematics (ICIAM 2023).* Invited conference to Minisymposium on Numerical Algorithms for the Eikonal Equation and Its Applications, Tokyo, Japan, 20-25 August 2023.

[144] Laurent D. Cohen. Active Contours and geodesic methods. Conférence invitée, Keynote. In *5th International Conference on Video, Signal and Image Processing (VSIP 2023).*, Harbin, China, November 2023.

[145] Laurent D. Cohen. Fast marching and front propagation for image segmentation. In *ALGORITMY 2024, Central-European Conference on Scientific Computing.* Invited conference to Minisymposium on Numerical methods for level-set and eikonal equations – theory and applications, High Tatra Mountains, Slovakia, March 15-20, 2024.

[146] Nicolas Makaroff and Laurent D. Cohen. Image Segmentation Using Chan-Vese Energy Minimization Coupled with a CNN Provided Mask. In *2024 SIAM Imaging Science Meeting.* Invited conference to Minisymposium on Synergy in Segmentation: Bridging Classical and Deep Learning Approaches, Atlanta, Georgia, USA, May 28-31, 2024.

[147] Theo Bertrand, Nicolas Makaroff and Laurent D. Cohen. Region Segmentation Defined As the Unit Ball for the Geodesic Distance with Respect to a CNN Generated Riemannian Metric. In *2024 SIAM Imaging Science Meeting.* Invited conference to Minisymposium on Synergy in Segmentation: Bridging Classical and Deep Learning Approaches, Atlanta, Georgia, USA, May 28-31, 2024.

[148] Laurent D. Cohen. Fast Marching and Front Propagation for Image Segmentation. Conférence invitée, Keynote. In *6th International Conference on Video, Signal and Image Processing (VSIP 2024).*, Ningbo, China, November 22-24, 2023.

[149] Laurent D. Cohen. Fast Marching and Front Propagation for Image Segmentation. Conférence invitée, Keynote. In *The 5th International Conference on Medical Imaging and Computer-Aided Diagnosis (MICAD 2024).*, Manchester, UK, November 19-21, 2024.

Actes de Colloques avec comité de lecture

Remarquer que certaines entrées regroupent plusieurs publications.
La presque totalité de ces conférences sont internationales.

[150] Laurent D. Cohen. A new approach of vector quantization for image data compression and texture detection. In *International Conference on Pattern Recognition (ICPR'88)*, Rome, 1988.

[151] Laurent D. Cohen, Laurent Vinet, Peter T. Sander, and André Gagalowicz. Hierarchical region based stereo matching. In *Proc. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'89)*, San Diego, June 1989.

[152] Laurent D. Cohen, Laurent Vinet, Peter T. Sander, and André Gagalowicz. Cooperative segmentation and stereo matching. In *Proc. Topical Meeting on Image Understanding and Machine Vision*, Cape Cod, Massachusetts, June 1989. See also In *Proc. 6th Scandinavian Conference on Image Analysis*, Oulu, Finland, June 1989.

[153] N. Ayache, J.D. Boissonnat, E. Brunet, Laurent D. Cohen, J.P. Chièze, B. Geiger, O. Monga, J.M. Rocchisani, and P. Sander. Building highly structured volume representations in 3D medical images. In *Computer Aided Radiology*, Juin 1989. Berlin, West-Germany.

[154] Laurent D. Cohen and Isaac Cohen. A finite element method applied to new active contour models and 3D reconstruction from cross sections. In *Proc. Third IEEE International Conference on Computer Vision (ICCV'90)*, pages 587–591, Osaka, Japan, December 1990.

[155] Isaac Cohen, Laurent D. Cohen, and Nicholas Ayache. Introducing deformable surfaces to segment 3D images and infer differential structures. In *Proc. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'91)*, pages 738–739, Lahaina, Maui, Hawaii, 1991. voir aussi Proc. IEEE EMBS'91 et RR Inria 1403, May 1991.

[156] Laurent D. Cohen and Isaac Cohen. Deformable models for 3D medical images using finite elements & balloons. In *Proc. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'92)*, Champain, Illinois, June 1992.

[157] Isaac Cohen, Laurent D. Cohen, and Nicholas Ayache. Using deformable surface to segment 3-D images and infer differential structures. In *Proc. Second European Conference on Computer Vision (ECCV'92)*, pages 648–652, Santa Margherita Ligure, Italy, May 1992. In Lecture Notes in Computer Science: Computer Vision, Vol. 588 Springer-Verlag. Accompagné d'une vidéo dans les videoproceedings.

[158] Laurent D. Cohen, Eric Bardinet, and Nicholas Ayache. Reconstruction of digital terrain model with a lake. In *Proceedings SPIE 93 Conference on Geometric Methods in Computer Vision*, San Diego, CA, July 1993. autre version RR Inria 1824, Décembre 1992.

[159] Isaac Cohen and Laurent D. Cohen. A hybrid hyperquadric model for 2-D and 3-D data fitting. In *Proceedings of the 12th IEEE International Conference on Pattern Recognition (ICPR'94)*, pages B–403–405, Jerusalem, 1994.

[160] Eric Bardinet, Laurent D. Cohen, and Nicholas Ayache. Fitting 3D data using superquadrics and free-form deformations. In *Proceedings of the 12th IEEE International Conference on Pattern Recognition (ICPR'94)*, pages A–79–83, Jerusalem, October 1994. voir aussi congrès IEEE WBIA'94 et CVRMed'95.

[161] Laurent D. Cohen. Auxiliary variables for deformable models. In *Proc. Fifth IEEE International Conference on Computer Vision (ICCV'95)*, pages 975–980, Cambridge, USA, June 1995.

[162] Laurent D. Cohen and Anne Gorre. On the convexity of the active contour energy. In *Proceedings of GRETSI*, Juan-les-Pins, September 1995.

[163] Eric Bardinet, Laurent D. Cohen, and Nicholas Ayache. Tracking medical 3D data with a parametric deformable model. In *Proceedings of the IEEE International Symposium On Computer Vision*, Coral Gables, Florida, November 1995. Présenté aussi aux journées Orasis, Sophia-Antipolis, 1995

[164] E. Bardinet, Laurent D. Cohen, and N. Ayache. Tracking medical 3D data with a deformable parametric model. In *Proc. Third European Conference on Computer Vision (ECCV'96)*, pages I:317–328, Cambridge, U. K., April 1996. Accompagné d'une vidéo dans les videoproceedings.

[165] Laurent D. Cohen and Ron Kimmel. Global Minimum for Active Contour Models: A Minimal Path approach. In *Proc. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'96)*, pages 666–673, San Francisco, USA, June 1996.

[166] Laurent D. Cohen and Ron Kimmel. Regularization properties for minimal geodesics of a potential energy. In *Proc. 12th International Conference on Analysis and Optimization of Systems: Images, Wavelets and PDE's (ICAOS'96)*, Paris, France, June 1996.

[167] B. Leroy, I. Herlin, and Laurent D. Cohen. Multi-resolution algorithms for active contour models. In *Proc. 12th International Conference on Analysis and Optimization of Systems: Images, Wavelets and PDE's (ICAOS'96)*, Paris, France, June 1996.

[168] Laurent D. Cohen. Deformable curves and surfaces in image analysis. In *Third International Conference on Curves and Surfaces*, Chamonix, July 1996. Association Francaise d'Approximation (A.F.A.).

[169] B. Leroy, I. Herlin, and Laurent D. Cohen. Face identification by deformation measure. In *Proc. 13th IEEE International Conference on Pattern Recognition (ICPR'96)*, Vienne, Austria, August 1996.

[170] Laurent D. Cohen, F. Pajany, D. Pellerin, and C. Veyrat. Cardiac wall tracking using doppler tissue imaging (DTI). In *In Proc. of International Conference on Image Processing (ICIP'96)*, pages III–295–298, Lausanne, Suisse, Septembre 1996. Voir aussi communications à annual congress of the *American Society of Echocardiography*, Chicago, June 96. et 13th congress of the *European Society of cardiology*, Birmingham, UK.

[171] Zakaria Ben Sbeh, Laurent D. Cohen, Gérard Mimoun, Gabriel Coscas, and Gisèle Soubrane. Une méthode adaptative pour la segmentation de drusen. In *Proceedings of GRETSI*, Grenoble, Septembre 1997.

[172] Martin Lefébure and Laurent D. Cohen. Un algorithme multirésolution de recalage de signaux et d'images. In *Proceedings of GRETSI*, Grenoble, Septembre 1997. Présenté aussi aux journées Orasis, La colle sur Loup, Octobre 1997.

[173] Zakaria Ben Sbeh, Laurent D. Cohen, Gérard Mimoun, Gabriel Coscas, and Gisèle Soubrane. An adaptive contrast method for segmentation of drusen. In *In Proc. of International Conference on Image Processing (ICIP'97)*, Santa Barbara, California, October 1997.

[174] Martin Lefébure and Laurent D. Cohen. A multiresolution algorithm for signal and image registration. In *In Proc. of International Conference on Image Processing (ICIP'97)*, Santa Barbara, California, October 1997.

[175] Florence Coscas, Gérard Mimoun, Zakaria Ben Sbeh, Laurent D. Cohen, Gabriel Coscas and Gisèle Soubrane. Automatic Detection of Macular Drusen. In *Proc. of 28th International Congress of Ophtalmology, ISFA*, Amsterdam, The Nederlands, 21-25 June 1998.

[176] C Veyrat, D Pellerin, and L Cohen. Respective advantages of spectral, 2D and M mode color tissue doppler imaging. In *X Congress of the International Cardiac Doppler Society*, Kagawa, Japan, November 25-27 1998.

[177] T. Deschamps, J.-M. Letang, B. Verdonck, and L.D. Cohen. Automatic construction of minimal paths in 3D images: An application to virtual endoscopy. In *Computer Assisted Radiology and Surgery*, Paris, France, June 23-26 1999.

[178] T. Deschamps and L.D. Cohen. Path extraction in 3D medical images for virtual endoscopy. In *in Proc. Third Israeli Symposium on Computer-Aided Surgery, Medical Robotics, and Medical Imaging*, Technion, Haifa, Israel, May 18 2000.

[179] Sylvie Naudet, Marc Viala, Patrick Sayd, Laurent Cohen, Frédéric Jallon, Arnauld Dumont, and J. Monnerie. An as-build on line modeling technique AOMS. In *Proceedings of XIXth ISPRS Congress*, Amsterdam, July 2000.

[180] T. Deschamps and L.D. Cohen. Minimal paths in 3D images and application to virtual endoscopy. In *Proc. sixth European Conference on Computer Vision (ECCV'00)*, Dublin, Ireland, 26th June - 1st July 2000.

[181] Andres Almensa and L.D. Cohen. Fingerprint Image Matching by minimization of a thin-plate energy using a two-step algorithm with auxiliary variables. In *Proc. Workshop on Applications of Computer Vision (WACV'00)*, December 2000, Palm Springs.

[182] Patrick Sayd, Sylvie Naudet, Marc Viala, Laurent Cohen, and Arnaud Dumont. Aoms un outil de releve 3d d'environnements industriels. In *Actes du congrès de Vision ORASIS 2001*, Cahors, Juin 2001.

[183] S. Vinson, L. D. Cohen and F. Perlant Extraction of Rectangular Buildings using DEM and Orthoimage. In *Proc. Scandinavian Conference on Image Analysis (SCIA'01)*, June 2001, Bergen, Norway.

[184] M. Lefebure and L. D. Cohen. Image registration, optical flow and local rigidityimage registration, optical flow and local rigidity. In *Proc. of IEEE Scale-Space and Morphology in Computer Vision 2001*, Vancouver, Canada, July 2001.

[185] L. D. Cohen. Multiple contour finding and perceptual grouping using minimal paths. In *Proc. IEEE Workshop on Variational and Level Set Methods in Computer Vision*, Vancouver, Canada, July 2001. IEEE.

[186] M. Lefebure and L. D. Cohen. Optical Flow and Image Registration : a New Local Rigidity Approach for Global Minimization. In *Proc. of Third International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR - 2001)*, Sophia-Antipolis, September 2001.

[187] Laurent D. Cohen and Thomas Deschamps. Multiple Contour Finding and Perceptual Grouping as a set of Energy Minimizing Paths. In *Proc. of Third International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR - 2001)*, Sophia-Antipolis, September 2001.

[188] R. Truyen And T. Deschamps And L.D. Cohen. Clinical evaluation of an automatic path tracker for virtual colonoscopy. In *Proc. Medical Image Computing and Computer-Assisted Intervention, MICCAI'01, Utrecht, Netherlands*, October, 2001.

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6. Thomas Deschamps : Thèse soutenue à Paris-Dauphine le 20 Décembre 2001 *Extraction de courbes et surfaces par méthodes de chemins minimaux et ensembles de niveaux, Applications en Imagerie médicale 3D.*
7. Samuel Vinson : Thèse soutenue le 29 Avril 2002 à Paris-Dauphine. *Modèles déformables et Méthodes variationnelles : applications en imagerie satellitaire et aérienne.*
8. Roberto Ardon : Thèse soutenue le 17 Mars 2005 à Paris-Dauphine. *Extraction de surfaces contraintes dans des images 3D et chemins minimaux, applications en imagerie médicale.*
9. Valérie Moreau : Thèse soutenue le 15 Décembre 2005 à l'INRIA Sophia. *Méthodes Variationnelles et séquentielles pour l'étude de la contraction cardiaque.*
10. Pablo Arbelaez : Thèse soutenue le 24 Novembre 2005 à Paris-Dauphine. *Une approche métrique pour la Segmentation d'images.*
11. Stéphane Bonneau : Thèse soutenue le 18 Décembre 2006 à Paris-Dauphine. *Chemins minimaux en Analyse d'images : Nouvelles contributions et applications à l'imagerie biologique.* .
12. Oudom Somphone : Thèse soutenue le 4 Février 2009 à Paris-Dauphine. *Recalage par éléments finis avec partition de l'unité - Applications en imagerie médicale.*
13. Adrien Auclair: Thèse soutenue le 10 septembre 2009. *Méthodes rapides pour la recherche des plus proches viosins SIFT : application à la recherche d'images, et Contributions à la reconstruction 3D multivues.*

14. Fethalla Benmansour : Thèse soutenue le 17 Décembre 2009 à Paris-Dauphine *Méthode des chemins minimaux appliquée à l'imagerie médicale : Segmentation de structures Tubulaires et de Surfaces par Anisotropie multi-échelle et par détection récursive de points -clés.*
15. Jean-Baptiste Fiot : Thèse soutenue le 17 Septembre 2013 à Paris-Dauphine *Mathematical methods of image analysis for cross-sectional and longitudinal population studies* .
16. Prasenjit Saha : Thèse DSRA soutenue le 16 Septembre 2013 à Paris-Dauphine *Méthodes géodésiques en analyse d'images.*
17. Raphael Prevost : Thèse soutenue le 21 Octobre 2013 à Paris-Dauphine *Variational methods for model-based image segmentation - Applications in medical imaging* .
18. Jose Alberto Iglesias Martinez: Thèse commencée en 2010 sur des *méthodes de vote géodésique pour la reconnaissance de formes*, en collaboration avec le Technion, Haifa, Israel, dans le cadre d'une bourse du projet Européen FIRST. Thèse soutenue en 2015. Université de Vienne, Autriche.
19. Da Chen: Thèse soutenue le 27 Septembre 2016 à Paris-Dauphine sur des *Nouveaux modèles de chemin minimal pour l'extraction de structures tubulaires et la segmentation d'images.*
20. Fang Yang: Thèse soutenue le 14 Septembre 2017 à Paris-Dauphine, sur *Finding Contours in Images Using Geodesic Lines and Field Lines.*
21. Abraham Marciano: Thèse soutenue le 3 Juillet 2018 à Paris-Dauphine, sur des *méthodes de recalage pour des images de radiographie industrielle.*
22. Qi-Chong Tian: Thèse soutenue le 4 Octobre 2018 à Paris-Dauphine, sur *Color Correction and Contrast Enhancement for natural Images and Videos.*
23. Emmanuel Cohen: Thèse soutenue le 19 Décembre 2018 à Paris-Dauphine, sur *Cartographie, analyse et reconnaissance des réseaux vasculaires par Doppler ultrasensible.*
24. Liu Li: Thèse soutenue le 28 Aout 2019, sur *Geodesic metrics approach and its application in retinal image processing.* En codirection avec le Pr Shu, Nanjing Southeast University, Chine
25. Raphael Groscot: Thèse soutenue le 29 Juin 2021 à Paris-Dauphine, sur *Représentations séparables de formes 3D pour le traitement de formes, Separable 3D Shape representation for shape processing.*
26. Théo Bertrand: Thèse soutenue le 20 Septembre 2024 à Paris-Dauphine, sur *Méthodes Géodésiques et Apprentissage pour la Microscopie par Localisation Ultrasonore.*
27. Nicolas Makaroff: Thèse soutenue le 10 Décembre 2024 à Paris-Dauphine, sur *Segmentation par apprentissage profond avec contraintes géométriques et contours actifs.*

28. Changqing Fu: Thèse soutenue le 18 Décembre 2024 à Paris-Dauphine, sur *Géométrie dans les Modèles Génératifs.* .