Stéphane Derrode

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État civil	Né le 16/06/1971. Marié, un enfant.	

Professeur des Universités, 27ᵉ Section CNU
Centrale Lyon - LIRIS (CNRS UMR 5205)

Cursus et Expériences

24➟ **Responsable du Master Informatique** de l'Université de Lyon 1 sur le site de Centrale Lyon.

20➟24 **Responsable de l'équipe Imagine** du LIRIS. Auparavant responsable adj.
À ce titre, j'étais membre du Conseil scientifique (CS) du LIRIS.

Sept. 14➟ **Professeur des Universités** (27ᵉ section CNU) à Centrale Lyon
Enseignant/chercheur au Laboratoire d'InfoRmatique en Image et Systèmes d'information (LIRIS).

2008 **Habilitation à Diriger des Recherches** d'Aix-Marseille Université.
TITRE Contributions en segmentation statistique et reconnaissance de formes 2D.
DATE 29 avril 2008

01➟14 **Maître de Conférences** (61ᵉ section) à Centrale Méditerranée (auparavant École Nationale Sup. de Physique de Marseille - ENSPM)
Enseignant/chercheur en informatique, en traitement du signal et des images au sein du *Groupe Signaux Multidimensionnels* de l'INSTITUT FRESNEL (CNRS UMR 7249).

95➟99 **Thèse de 3ᵉ cycle** de l'université de Rennes 1, réalisée au sein du département *ITI* de l'ENST-BRETAGNE, sous la direction de F. Ghorbel.
TITRE Représentation de formes planes par différentes approximations de Fourier-Mellin analytique en vue d'indexation de bases d'images.

Bilan des Activités de Recherche

Participation à des ouvrages (chapitres)	3
Articles en revues internationales	33
Brevets internationaux	2
Communications en conf. internationales	33

Les pdf des papiers sur : http://perso.ec-lyon.fr/derrode.stephane/Research/Research/.

➥ **Co-encadrements de thèses (soutenues et en cours)** : 12 dont 2 en cours.

➥ **Animations scientifiques** : Rapporteur de 14 thèses dont 1 HDR.

➥ **Quatre publications significatives** :

— M.-A. Chermi, **S. Derrode**, and F. Ghorbel. Fourier-based geometric shape prior for snakes. Pattern Recognition Letters, 29(7) :897–904, May 2008.

— L. Benyoussef and **S. Derrode**. Tessella-oriented segmentation and guidelines estimation of ancient mosaic images. J. of Electronic Imaging, 17(4), October 2008.

— H. Li, **S. Derrode**, and W. Pieczynski, Adaptive On-line Lower Limb Locomotion Activity Recognition Using Semi-Markov Model and Single Wearable Inertial Sensor, Sensors, Vol. 19(19), 4242, 2019.

— Z. Bouyahia, H. Haddad, **S. Derrode**, and W. Pieczynski, Toward a Cost-Effective Motorway Traffic State Estimation From Sparse Speed and GPS Data, IEEE Access (9), 2021.

Liste des Publications

Table 1 – Rang des papiers en revues - SJR, from `http://www.scimagojr.com/`.

Q1	Q2	Q3	Q4	Autre	Total
18	7	1	0	1	27
67%	25%	4%	0%	4%	100%

➥ Thèse et HDR

[1] **Stéphane Derrode**. *Représentation de formes planes à niveaux de gris par différentes approximations de Fourier-Mellin analytique en vue d'indexation de bases d'images*. Thèse de 3ᵉ cycle, Université de Rennes I, ENST BRETAGNE (Dpt *ITI*), Soutenue le 15 décembre 1999. Encadrée par F. Ghorbel (ENSI/GRIFT, Tunisie). Jury : R. Collorec (Prés.), B. Choquet (Rap.), A. Le Méhauté (Rap.), A. Hillion, C. Roux (Exam.), P. Haigron (Exam.) et F. Ghorbel (Exam.).

[2] **Stéphane Derrode**. *Contributions en segmentation statistique d'images et reconnaissance de formes 2D*. Habilitation à Diriger des Recherches, Université Paul Cézanne d'Aix-Marseille, Institut Fresnel, Équipe GSM, Soutenue le 29 avril 2008. Jury : W. Pieczynski (Prés.), J.-P. Haton (Rap.), M. Acheroy (Rap.), E. Moreau (Rap.), J. Blanc-Talon (Exam.) et S. Bourennnane (Exam.).

➥ Participation à des ouvrages

[3] G. Mercier, **S. Derrode**, E. Trouvé, and L. Bombrun. *Multivariate Image Processing : Methods and Applications*, chapter Change Detection in Remote Sensing Observation. Digital Signal and Image Processing Series, ISBN-10 : 1848211392, ISBN-13 : 978-1848211391. J. Chanussot, Ch. Collet and K. Chehdi Editors, ISTE Ltd and John Wiley et Sons Inc, 2009.

[4] L. Benyoussef and **S. Derrode**. *Imaging for Culturage Heritage*, chapter Analysis of ancient mosaic images for dedicated applications. Digital Imaging and Computer Vision Book Series. Filippo Stanco, Sebastiano Battiato and Giovanni Gallo Editors, CRC Press / Taylor & Francis, 2011.

[5] **S. Derrode** and W. Pieczynski. *Avancées Récentes en Reconnaissance Statistique de Formes*, chapter Modèles de mélange à copules : simulation, restauration et sélection. F. Ghorbel, S. Derrode et O. Alata, 2012.

➥ Revues internationales avec comité de lecture

[6] **S. Derrode** and F. Ghorbel. Robust and efficient Fourier-Mellin transform approximations for invariant grey-level image description and reconstruction. *Computer Vision and Image Understanding*, 83(1) :57–78, July 2001. **SJR : Q1**.

[7] **S. Derrode** and F. Ghorbel. Shape analysis and symmetry detection in gray-level objects using the Fourier-Mellin representation. *Signal Processing*, 84(1) :25–39, January 2004. **SJR : Q1**.

[8] **S. Derrode** and W. Pieczynski. Unsupervised signal and image segmentation using pairwise Markov chains. *IEEE Trans. on Signal Processing*, 52(9) :2477–2489, September 2004. **SJR : Q1**.

[9] C. Carincotte, **S. Derrode**, and S. Bourennane. Unsupervised change detection on SAR images using fuzzy hidden Markov chains. *IEEE Trans. on Geosci. and Rem. Sens.*, 44(2) :432–441, 2006. **SJR : Q1**.

[10] F. Ghorbel, **S. Derrode**, R. Mezhoud, T. Bannour, and S. Dhahbi. Image reconstruction from a complete set of similarity invariants extracted from complex moments. *Pattern Recognition Letters*, 27 :1361–1369, September 2006. **SJR : Q1**.

[11] **S. Derrode** and G. Mercier. Multiscale oil slick segmentation from SAR images using a vector HMC model. *Pattern Recognition*, 40(3) :1135–1147, March 2007. **SJR : Q1**.

[12] W. Ketchantang, **S. Derrode**, L. Martin, and S. Bourennane. Pearson-based mixture model for color object tracking. *Machine Vision and Applications, Special issue on video surveillance research in industry and academia*, 19(5-6), October 2008. SJR : Q2.

[13] L. Benyoussef, C. Carincotte, and **S. Derrode**. Extension of higher-order HMC modeling with application to image segmentation. *Digital Signal Processing*, 18(5) :849–860, 2008. SJR : Q2.

[14] M.-A. Chermi, **S. Derrode**, and F. Ghorbel. Fourier-based geometric shape prior for snakes. *Pattern Recognition Letters*, 29(7) :897–904, May 2008. **SJR : Q1**.

[15] Z. Bouyahia, L. Benyoussef, and **S. Derrode**. Change detection in SAR images with a sliding hidden Markov chain model. *J. of Applied Remote Sensing*, 2(1) :023526, 2008. SJR : Q2.

[16] L. Benyoussef and **S. Derrode**. Tessella-oriented segmentation and guidelines estimation of ancient mosaic images. *J. of Electronic Imaging*, 17(4), October 2008. SJR : Q3.

[17] **S. Derrode**, L. Benyoussef, and W. Pieczynski. Subsampling-based HMC parameters estimation with application to large data sets classification. *Signal, Image and Video Processing Journal*, May 2012. doi :10.1007/s11760-012-0324-2, SJR : Q2.

[18] **S. Derrode** and W. Pieczynski. Unsupervised parameters estimation in generalized pairwise Markov chain with automatic copulas selection. *Computational Statistics & Data Analysis*, 63 :81–98, July 2013. doi : 10.1016/j.csda.2013.01.027, **SJR : Q1**.

[19] V. Némesin and **S. Derrode**. Robust blind pairwise Kalman algorithms using QR decompositions. *IEEE Trans. on Signal Processing*, 61(1) :5–9, 2013. **SJR : Q1**.

[20] **S. Derrode** and W. Pieczynski. Exact fast computation of optimal filter in Gaussian switching linear systems. *IEEE Signal Processing Letters*, 20(7) :701–704, July 2013. SJR : Q2.

[21] N. Abassi, D. Benboudjema, **S. Derrode**, and W. Pieczynski. Optimal filter approximations in conditionally Gaussian pairwise Markov switching models. *IEEE Trans. on Automatic Control*, 60(4) :1104–1109, April 2015. **SJR : Q1**.

[22] V. Némesin and **S. Derrode**. Robust partial-learning in linear Gaussian systems. *IEEE Trans. on Automatic Control*, 60(9) :2518–2523, 2015. **SJR : Q1**.

[23] V. Némesin and **S. Derrode**. Quality-driven real-time iris recognition from close-up eye videos. *Signal, Image and Video Processing Journal*, 10(1) :153–160, 2016. SJR : Q2.

[24] **S. Derrode** and W. Pieczynski. Unsupervised classification using hidden Markov chain with unknown noise copulas and margins. *Signal Processing*, 128 :8–17, November 2016. **SJR : Q1**.

[25] I. Gorynin, **S. Derrode**, E. Monfrini, and W. Pieczynski. Fast Filtering in Switching Approximations of Nonlinear Markov Systems With Applications to Stochastic Volatility. *IEEE Trans. on Automatic Control*, 62(2) :853–862, February 2017. **SJR : Q1**.

[26] I. Gorynin, **S. Derrode**, E. Monfrini, and W. Pieczynski. Fast smoothing in switching approximations of non-linear and non-Gaussian models. *Computational Statistics and Data Analysis*, 114 :38–46, 2017. doi : https ://doi.org/10.1016/j.csda.2017.04.007, **SJR : Q1**.

[27] F. Zheng, **S. Derrode**, and W. Pieczynski. Parameter Estimation in Switching Markov Systems and Unsupervised Smoothing. *IEEE Trans. on Automatic Control*, 64(4) :1761–1767, April 2019. **SJR : Q1**.

[28] Q. Ju, R. Chalon, and **S. Derrode**. Assisted Music Score Reading Using Fixed-Gaze Head Movement : Empirical Experiment and Design Implications. *PACM on Human-Computer Interaction Journal*, 3(EICS) :3 :1–3 :29, 2019. SJR : trop récent.

[29] H. Li, **S. Derrode**, and W. Pieczynski. Lower limb locomotion activity recognition of healthy individuals using semi-Markov model and single wearable inertial sensor. *Sensors*, 19 :4242–1, September 2019. doi : 10.3390/s19194242, SJR : Q2.

[30] H. Li, **S. Derrode**, and W. Pieczynski. An adaptive and on-line IMU-based locomotion activity classification method using a triplet Markov model. *Neurocomputing*, (362) :94 – 105, October 2019. doi : 10.1016/j.neucom.2019.06.081, **SJR : Q1**.

[31] F. Zheng, **S. Derrode**, and W. Pieczynski. Semi-supervised optimal recursive filtering and smoothing in non-Gaussian Markov switching models. *Signal Processing*, 171 :107511–1 :107511–10, June 2020. doi : 10.1016/j.sigpro.2020.107511, **SJR : Q1**.

[32] Z. Bouyahia, **S. Derrode**, and W. Pieczynski. Filtering in Gaussian linear systems with fuzzy switches. *IEEE Trans. Fuzzy Syst.*, 28(8) :1760–1770, 2020. doi : 10.1109/TFUZZ.2019.2921944, **SJR : Q1**.

➥ Conférences internationales avec comité de lecture

[33] **S. Derrode** and W. Pieczynski. SAR image segmentation using generalized pairwise Markov chains. In *SPIEs Int. Symp. on Remote Sensing (SPIE-RS'02)*, Crete (Greece), 22-27 September 2002.

[34] **S. Derrode** and F. Ghorbel. Shape distance for rotation estimation and rotational symmetry detection in gray-level images. In *Proc. of the XIème European Signal Processing Conf. (EUSIPCO'02)*, Toulouse (France)), 3-6 September 2002.

[35] **S. Derrode**, G. Mercier, and W. Pieczynski. Unsupervised multicomponent image segmentation combining a vectorial HMC model and ICA. In *Proc. of the IEEE Int. Conf. on Image Processing (ICIP)*, Barcelona (Spain), 14-17 September 2003.

[36] G. Mercier, **S. Derrode**, and M. Lennon. Hyperspectral image segmentation with Markov chain model. In *Proc. of the IEEE IGARSS'03*, Toulouse (France), 21-25 July 2003.

[37] G. Mercier, **S. Derrode**, W. Pieczynski, J.-M. Lecaillec, and R. Garello. Multiscale oil slick segmentation with Markov chain model. In *Proc. of the IEEE Int. Conf. IGARSS'03*, Toulouse (France), 21-25 July 2003.

[38] **S. Derrode**, G. Mercier, and W. Pieczynski. Unsupervised change detection in SAR images using a multicomponent HMC model. In *Proc. of the 2nd Int. MultiTemp Workshop*, Ispra (Italy), 16-18 July 2003.

[39] C. Carincotte, **S. Derrode**, G. Sicot, and J.-M. Boucher. Unsupervised image segmentation based on a new fuzzy HMC model. In *Proc. of the IEEE Int. Conf. ICASSP'04*, Montreal (Canada), 17-21 May 2004.

[40] **S. Derrode**, C. Carincotte, and S. Bourennane. Unsupervised image segmentation based on high-order hidden Markov chains. In *Proc. of the IEEE Int. Conf. ICASSP'04*, Montreal (Canada), 17-21 May 2004.

[41] G. Mercier and **S. Derrode**. SAR image change detection using distance between distributions of classes. In *Proc. of the IEEE Int. Conf. IGARSS'04*, Anchorage (Alaska, USA), 20-24 September 2004.

[42] N. Brunel, W. Pieczynski, and **S. Derrode**. Copulas in vectorial hidden Markov chains for multicomponent image segmentation. In *Proc. of the IEEE Int. Conf. ICASSP'05*, Philadelphia (USA), 19-23 March 2005.

[43] C. Carincotte, **S. Derrode**, and S. Bourennane. Multivariate fuzzy hidden Markov chains model applied to unsupervised multiscale SAR image segmentation. In *Proc. of the IEEE Int. Conf. FUZZ'05*, Reno (Nevada, USA), 22-25 May 2005.

[44] W. Ketchantang, **S. Derrode**, S. Bourennane, and L. Martin. Video pupil tracking for iris based identification. In *Proc. of the Advanced Concepts for Intelligent Vision Systems (ACIVS'05)*, Antwerp (Belgium), 20-23 September 2005.

[45] F. Ghorbel, **S. Derrode**, S. Dhahbi, and R. Mezhoud. Reconstructing with geometric moments. In *Proc. of the Int. Conf. on Machine Intelligence (ACIDCA-ICMI'05)*, Tozeur (Tunisia), 5-7 November 2005.

[46] **S. Derrode**, M. A. Chermi, and F. Ghorbel. Fourier-based invariant shape prior for snakes. In *Proc. of the IEEE Int. Conf. ICASSP'06*, Toulouse (France), 14-19 May 2006.

[47] **S. Derrode**, L. Benyoussef, and W. Pieczynski. Contextual estimation of hidden Markov chains with application to image segmentation. In *Proc. of the IEEE Int. Conf. ICASSP'06*, Toulouse (France), 14-19 May 2006.

[48] M. A. Chermi, **S. Derrode**, and F. Ghorbel. Euclidean invariant snake for joint stereo segmentation. In *Proc. of the IEEE Int. Conf. ICTTA'06*, Damascus (Syria), 24-28 April 2006.

[49] G. Mercier, **S. Derrode**, W. Pieczynski, J.-M. Nicolas, A. Joannic-Chardin, and J. Inglada. Copula-based stochastic kernels for abrupt change detection. In *Proc. of the IEEE Int. Conf. IGARSS'06*, Denvers (Colorado, USA), July 31-August 4 2006.

[50] Z. Bouyahia, L. Benyoussef, and **S. Derrode**. Unsupervised SAR images change detection with hidden Markov chains on a sliding window. In *Proc. of the SPIE-RS'07 - Image and Signal Processing for Remote Sensing*, Florence (Italy), 17 - 21 September 2007.

[51] M.-A. Chermi, F. Ghorbel, and **S. Derrode**. Using Fourier-based shape alignment to add geometric prior to snakes. In *Proc. of the IEEE Int. Conf. ICASSP'09*, Taipei (Taiwan), 19 - 24 April 2009.

[52] W. Sawaya, **S. Derrode**, M. Oould-Barikalla, and J. Rivaillier. Detection and iterative decoding of a 2D alphabetic barcode. In *Proc. of the IEEE Int. Conf. MLSP'09*, Genoble (France), September 2-4 2009.

[53] N. Benletaief, A. Benazza, and **S. Derrode**. Pupil localization and tracking for vide-based iris biometrics. In *Proc. of the Int. Conf. ISSPA'10*, Kuala Lumpur (Malaysia), May 10-13 2010.

[54] M. A. Charmi, M. A. Mezghich, S. M'Hiri, **S. Derrode**, and F. Ghorbel. Geometric shape prior to region-based active contour using Fourier-based shape alignment. In *Proc. of the IEEE Int. Conf. IST'10*, Thessaloniki (Greece), July 1-2 2010.

[55] **S. Derrode** and W. Pieczynski. Unsupervised restoration in Gaussian pairwise mixture model. In *Proc. of the Int. Conf. EUSIPCO'11*, Barcelona (Spain), August 29 - September 2 2011.

[56] S. Yousfi, **S. Derrode**, and R. Robbana. Watermarking in e-voting for large scale election. In *Proc. of the Int. Conf. ARES'11*, Vienna (Austria), August 22-26 2011.

[57] **S. Derrode** and W. Pieczynski. Copulas selection in pairwise Markov chain. In *Proc. of the 20th Int. Conf. on Computational Statistics (COMPSTAT'12)*, Limassol (Cyprus), August 27-31 2012.

[58] V. Némesin, **S. Derrode**, and A. Benazza. Gradual iris code construction from close-up eye video. In *Proc. of the Int. Conf. Advanced Concepts for Intelligent Vision Systems (ACIVS'12)*, Brno (Czech Republic), September 4-7 2012.

[59] V. Némesin and **S. Derrode**. Inferring segmental pairwise Kalman filter with application to pupil tracking. In *Traitement et Analyse de l'Information - Méthodes et Applications (TAIMA)*, Hammamet (Tunisie), 8-13 Mai 2013.

[60] W. Pieczynski, **S. Derrode**, N. Abassi, Y. Petitin, and F. Desbouvries. Exact optimal filtering in an approximating switching system. In *Traitement et Analyse de l'Information - Méthodes et Applications (TAIMA)*, Hammamet (Tunisie), 8-13 Mai 2013.

[61] **S. Derrode** and W. Pieczynski. Fast filter in nonlinear systems with application to stochastic volatility model. In *Proc. of the Int. Conf. EUSIPCO'14*, Lisbonne (Portugal), 1-5 September 2014.

[62] I. Gorynin, **S. Derrode**, E. Monfrini, and W. Pieczynski. Exact fast smoothing in switching models with application to stochastic volatility. In *Proc. of the Int. Conf. EUSIPCO'15*, Nice, France, August 2015.

[63] F. Zheng, **S. Derrode**, and W. Pieczynski. Parameter estimation in conditionally Gaussian pairwise Markov switching models and unsupervised smoothing. In *Machine Learning for Signal Processing (MLSP'16)*, Salerno, Italy, September 2016.

[64] F. Zheng, **S. Derrode**, and W. Pieczynski. Fast Exact Filtering in Generalized Conditionally Observed Markov Switching Models with Copulas. In *Traitement et Analyse de l'Information - Méthodes et Applications (TAIMA)*, Hammamet (Tunisia), April 30 - May 5 2018.

[65] H. Li, **S. Derrode**, L. Benyoussef, and W. Pieczynski. Unsupervised Pedestrian Trajectory Reconstruction from IMU Sensors. In *Traitement et Analyse de l'Information - Méthodes et Applications (TAIMA)*, Hammamet (Tunisia), April 30 - May 5 2018.

[66] H. Li, **S. Derrode**, L. Benyoussef, and W. Pieczynski. Free walking 3D pedestrian large trajectory reconstruction from IMU Sensors. In *Proc. of the Int. Conf. EUSIPCO'18, pp. 657-661*, Roma (Italy), 2018.

[67] M. Baubriaud, **S. Derrode**, R. Chalon, and K. Kernn. Accelerating Indoor Construction Progress Monitoring with Synthetic Data-Powered Deep Learning. In Vicente Gonzalez-Moret, Jiansong Zhang, Borja García de Soto, and Ioannis Brilakis, editors, *Proceedings of the 41st Int. Symp. on Automation and Robotics in Construction*, pages 792–799, Lille, France, June 2024. Int. Association for Automation and Robotics in Construction (IAARC).