

# Stéphane Derrode

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## Full Professor

École Centrale de Lyon, France  
LIRIS Lab (CNRS UMR 5205)

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30 papers in international journals • 24 Q1 SJR • 39 international conferences • 11 PhD co-supervisions (2 in progress) • 18 PhD / 2 HDR examiner duties • 4 CoS chaired • 55 co-authors • LIRIS lead, ANR AIDIBOP (2025–2029)

Full Professor at École Centrale de Lyon (Imagine team, LIRIS), I have been working for 25 years on Markov models for unsupervised learning, time-series filtering and image segmentation. My research now finds applications in healthcare and biology (ANR AIDIBOP project, with ISA / Hospices Civils de Lyon), smart cities, industrial construction (CIFRE SPIE, augmented reality, BIM) and human activity recognition.

## Career and Positions

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- 24→ **Head of the Computer Science Master's program** of Université Lyon 1 at the Centrale Lyon site.
- 20→24 **Head of the Imagine team** at LIRIS (previously deputy head since 2017). As such, member of the LIRIS Scientific Council.
- Sept. 14→ **Full Professor** (CNU section 27) at École Centrale de Lyon. Teacher and researcher at LIRIS.
- 2008 **Habilitation à Diriger des Recherches** (HDR), Aix-Marseille University. Title: *Contributions in statistical segmentation and 2D pattern recognition.*
- 01→14 **Associate Professor** (CNU section 61) at École Centrale Marseille (formerly EN-SPM), within INSTITUT FRESNEL.
- 95→99 **PhD** from Université de Rennes 1 / ENST-BRETAGNE (Adv.: F. Ghorbel). Title: *Plane shape representation using Fourier-Mellin approximations for image database indexing.*

## Research activities

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Book chapters	3
Papers in international peer-reviewed journals	30
Papers in national peer-reviewed journals	4
Papers in international conferences	39

Preprints available at <http://perso.ec-lyon.fr/derrode.stephane/Research.php>.

► **PhD co-supervisions** : 11 theses (2 in progress).

Most recent: [Léo Calmettes](#) (in progress, ENTPE), [Léo Schneider](#) (in progress, Centrale Lyon),

Mathis Baubriaud (March 2025, CIFRE SPIE), Liqun Liu (Nov. 2022, CSC).

### ► Service to the community :

- PhD/HDR examiner for 18 theses (incl. 2 HDR), 2010–2024.
- Area Chair, IEEE Int. Conf. on Image Processing (**ICIP'15**), Québec.
- Technical Program Committee : TAIMA'15/'18, CSA'16, EUVIP'16, RFMI'16, ACIVS'17.
- Project reviewer : ANR (2009, 2013), FQRNT (2009, 2010), Academy of Finland (2016), HCERES I3S (2016), Marie Skłodowska-Curie ITN (2017, 2020).

### ► Funded research projects :

- **2025–2029 ANR AIDIBOP** (LIRIS lead): AI-based diagnosis of bloodstream infections from bottom-up proteomes (Centrale Lyon / UCBL / HCL).
- **2025–2027 VISIONS** (FIL): computer vision for infant cognitive development (ISCMJ / LIRIS).
- **2024–2026 Carnot 3DSurf**: sustainable super-hydrophobicity through hybrid additive manufacturing (LTDS / MATEIS / LIRIS).
- **2023–2025 PIMI** (FIL, PI): pseudo mass-spectrum images for peptide identification.

## 🔗 Research themes

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**Methodologies:** Markov models (hidden chains/fields, pairwise and triplet, switching and fuzzy variants), Kalman-like filters for non-linear and non-Gaussian systems, copulas for dependency modeling, Bayesian inference and unsupervised learning, deep learning and computer vision, time-series modeling and filtering.

**Application domains:** healthcare and biology (mass-spectrometry analysis, antibiotic-resistance detection); smart cities and transportation (traffic state estimation and prediction); construction and industry (augmented reality, BIM-based progress monitoring, robotics); human activity and cognition (IMU-based locomotion recognition, infant visual development); biometrics and remote sensing (legacy).

## 📖 Three recent publications

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[2026] M. Baubriaud, **S. Derrode**, R. Chalon, K. Kernn.

*Results in Engineering*, 30:110380. **SJR Q1**.

*AR-based MEP Progress Monitoring using BIM and Synthetic Data.*

Construction-progress monitoring in augmented reality, combining BIM and synthetic data to train deep-learning models. Outcome of M. Baubriaud's CIFRE PhD with SPIE.

 [doi](#)  pdf

[2023] Z. Bouyahia, H. Haddad, **S. Derrode**, W. Pieczynski.

*J. of Intelligent Transportation Systems*, 27(4):503–522. **SJR Q1**.

*Traffic state prediction using conditionally Gaussian observed Markov fuzzy switching model.*

Traffic state prediction at a 60-minute horizon via a triplet Markov fuzzy switching model, validated on real motorway data.

 [doi](#)  dblp  pdf

[2020] F. Zheng, **S. Derrode**, W. Pieczynski.

*Signal Processing*, 171:107511. **SJR Q1**.

*Semi-supervised optimal recursive filtering and smoothing in non-Gaussian Markov switching models.*

Original family of conditionally Markov switching hidden linear models (CMSHLM) with copulas, supporting exact and fast recursive filtering and smoothing under non-Gaussian noise.

 [doi](#)  dblp  pdf