Julia Puig

GENERAL INFORMATION

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EDUCATION

2021 - 2025 **PhD in Signal and Image Processing**
Lyon, France
Institution: INSA Lyon
Lab: CREATIS

2016 - 2017 **MSc in Industrial and Applied Mathematics**
Grenoble, France
Institution: Université Grenoble Alpes and ENSIMAG

2012 - 2016 **BSc in Mathematics**
Barcelona, Spain
Institution: Universitat Politècnica de Catalunya

RESEARCH ACTIVITY

1. PhD Thesis (2021 - 2025)

Field: Signal and image processing
Title: Cardiac color Doppler from reduced packet sizes with deep learning
Lab: CREATIS UMR 5520 INSERM 1294, INSA Lyon
Defense date: May 26th 2025
Jury:

- Pr. Diana Mateus, Ecole Centrale Nantes, Examinatrice et présidente du jury
- Pr. Jørgen Jensen, DTU, Rapporteur
- Pr. Jean-Philippe Thiran, EPFL, Rapporteur
- Pr. Denis Friboulet, INSA Lyon, Directeur de thèse
- Pr. Damien Garcia, INSERM, Co-encadrant de thèse
- Dr. Fabien Millioz, Université Lyon 1, Co-encadrant de thèse

2. Research engineer (2017 - 2020)

Field: Computational biology
Title: Inference and analysis of gene regulatory networks in bladder cancer
Lab: CANTHER UMR 9020 CNRS U1277 Inserm, Université de Lille
Supervisor: Mohamed Elati

3. Master Thesis (2017)

Field: Image processing
Title: Classification of biological images with deep learning
Company: bioMérieux
Supervisor: Pierre Mahé

4. Bachelor Thesis (2016)

Field : Dynamical systems
Title : Bifurcations analysis of oscillating hypercycles
Institution : Universitat Politècnica de Catalunya
Supervisors : Toni Guillamon, Ernest Fontich et Jordi Sardanyés

PROFESSIONAL EXPERIENCE

2025 - 2026	**Postdoc in Signal and Image Processing** Lyon, France Institution: INSA Lyon Lab: CREATIS
2017 - 2020	**Engineer in Computational Biology** Lille, France Institution: Inserm, CNRS Lab: CANTHER
March - September 2017	**Intern in Image Processing** Grenoble, France Company: bioMérieux
July - September 2015	**Intern in Data Science** Barcelona, Spain Company: LaMagnética

PUBLICATION LIST

Journal papers

1. **J. Puig**, D. Friboulet, H. J. Ling, M. Mougharbel, J. Porée, J. Provost, D. Garcia and F. Millioz, "Boosting Cardiac Color Doppler Frame Rates With Deep Learning", in *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 71, no. 11, pp. 1540-1551, Nov. 2024, doi:10.1109/TUFFC.2024.3424549.

2. H. J. Ling, S. Bru, **J. Puig**, F. Vixège, S. Mendez, F. Nicoud, P.-Y. Courand, O. Bernard, and D. Garcia. "Physics-Guided Neural Networks for Intraventricular Vector Flow Mapping", *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 71, no. 11, pp. 1377-1388, Nov. 2024, doi:10.1109/TUFFC.2024.3411718.

3. W. Dhifli, **J. Puig**, A. Dispot, A., M. Elati. Latent network-based representations for large-scale gene expression data analysis. *BMC Bioinformatics* 19, 81–90, 2019, doi: 10.1186/s12859-018-2481-y.

4. **J. Puig**, G. Farré, A. Guillamon, E. Fontich, J. Sardanyés. Bifurcation gaps in asymmetric and high-dimensional hypercycles. *International Journal of Bifurcation and Chaos* 28 (1) (2018) 1-17, doi:10.1142/S021812741830001X.

International conferences

1. **J. Puig**, D. Friboulet, J. Porée, A.Leconte, N. Ghigo, J. Provost, D. Garcia, F. Millioz. "Breaking Packet Size Limits in Cardiac Color Doppler", *IEEE International Ultrasonics Symposium (IUS)*, 2025, Utrecht, Netherlands. (Poster)

2. **J. Puig**, D. Friboulet, J. Porée, J. Provost, D. Garcia, F. Millioz. "A deep learning approach for clutter filtering from short packet sizes in color Doppler", *IEEE International Ultrasonics Symposium (IUS)*, 2024, Taipei, Taiwan. (Oral presentation)

3. **J. Puig**, F. Millioz, D. Garcia, D. Friboulet. "Complex-Valued CNNs for Phase Shift Estimation in Color Doppler Imaging", *IEEE International Ultrasonics Symposium* (IUS), 2023, Montreal, Canada. (Oral presentation)

National conferences

1. **J. Puig**, F. Millioz, D. Garcia, D. Friboulet. "Filtre de paroi par apprentissage profond pour l'estimation de vitesse Doppler en échocardographie", GRETSI 2025 - *Colloque Francophone de Traitement du Signal et des Images*, 2025, Strasbourg, France.
2. **J. Puig**, D. Friboulet, J. Porée, J. Provost, D. Garcia, F. Millioz. "Accelerating the frame rate of echocardiography with deep learning", *Colloque Français d'Intelligence Artificielle en Imagerie Biomédicale* (IABM), 2025, Nice, France. (Poster)
3. **J. Puig**, F. Millioz, D. Garcia, D. Friboulet. "Clutter filtering in echocardiography with deep learning", *Colloque Français d'Intelligence Artificielle en Imagerie Biomédicale* (IABM), 2024, Grenoble, France. (Poster)
4. **J. Puig**, F. Millioz, D. Garcia, D. Friboulet. "Estimation du déphasage et réduction du repliement par apprentissage profond pour l'imagerie ultrasonore", GRETSI 2023 - *Colloque Francophone de Traitement du Signal et des Images*, 2023, Grenoble, France.
5. **J. Puig**, F. Millioz, D. Garcia, D. Friboulet. "Complex CNNS for blood velocity estimation in ultrasound imaging", *Colloque Français d'Intelligence Artificielle en Imagerie Biomédicale* (IABM), 2023, Paris, France. (Poster)

TEACHING

- Polytech Lyon: Statistics for Medical Applications (L3, 46 h)
- Polytech Lyon: Signal Processing (L3, 18 h)
- DLMI Spring School: Deep learning basics in python (Graduate, 14 h)

SERVICE

Reviewing

- IEEE Transactions on Ultrasonics, IEEE Transactions on Medical Imaging

Science communication

- Trace ton son. Workshop aimed at students aged 7 to 14 and designed to explore, in an interactive way, the production, propagation, and detection of sound. I participated to the workshop during three editions.
- Research careers and women in research. Workshop aimed at students aged 9 to 11 to introduce them to the activities carried out in our research laboratory, as well as to highlight the historical underrepresentation of women in research careers.

Conference staff volunteer

- Spring school *Deep Learning for Medical Imaging (DLMI)* (Lyon, April 2023)
- Conference *Functional Imaging and Modelling of the Heart (FIMH)* (Lyon, June 2023)

PROGRAMMING SKILLS

- Python, Matlab, R

LANGUAGES

- English (C1), French (Native), Spanish (Native), Catalan (Native)