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Research Experience

Sept. 2017 **Postdoctorate Research Fellow** *Under the supervision of Ruben Coen-Cagli.* Department of Comp. Biology, Albert Einstein College of Medicine (AECOM), New-York.

2016–2017 **Postdoctorate Research Fellow** *Under the supervision of Gabriel Peyré.* Département de Mathématiques et Applications (DMA), École Normale Supérieure, Paris.

2013–2017 **PhD under the supervision of G. Peyré and C. Monier** *Applied Mathematics and Neurosciences. Dynamic Textures Synthesis for Probing Vision in Psychophysics and Electrophysiology.* Link Dauphine University (Paris Sciences Lettres), Paris. Unité Neuroscience, Information et Complexité (UNIC-CNRS), Gif-sur-Yvette.

2011–2012 **Research internship under the supervision of J-M. Morel and B. Coll** *Texture synthesis : the Portilla-Simoncelli algorithm (statistical tools, optimization, C implementation).* Universitat de les Illes Balears, Mallorca. Centre de Mathématiques et de Leurs Applications (CMLA), Cachan.

List of Contributions

Pre-prints

Vacher J., Coen-Cagli R., Combining mixture models with linear mixing updates : multilayer image segmentation and synthesis, *arXiv 1905.10629, 2019* Link

Vacher J., Mamassian P., Coen-Cagli R., Probabilistic Model of Visual Segmentation, *arXiv 1806.00111, 2019* Link

Journals

Vacher J., Meso A. I., Perrinet L. U., Gabriel P., Bayesian Modeling of Motion Perception using Dynamical Stochastic Textures, *Neural Computation, 2018* Link

Briand T., Vacher J., How to Apply a Filter Defined in the Frequency Domain by a Continuous Function ?, *Image Processing On Line 6, 183-211, 2016* Link

Briand T., Vacher J., Galerne B., Rabin J., The Heeger-Bergen Pyramid Based Texture Synthesis Algorithm, *Image Processing On Line 4, 276–299, 2014* Link

Conferences

Le Coënt A., Fribourg L., Vacher J, Biologically Inspired Dynamic Textures For Probing Motion Perception, *IFAC Conference on Analysis and Design of Hybrid Systems, 2018* Link

Vacher J., Meso A. I., Perrinet L. U., Gabriel P., Biologically Inspired Dynamic Textures For Probing Motion Perception, *Advances in Neural Information Processing Systems, 1918-1926, 2015* Link

Participation in Conferences

June 2016 — Poster : Supervised Learning Estimation of Functional Maps from VSD Imaging *International Conference on Mathematical NeuroScience (ICMNS)* Link

Dec. 2015 — Poster and spotlight presentation : Biologically Inspired Dynamic Textures for Probing Motion Perception *Neural Information Processing Systems (NIPS)* Link

June 2015 — Poster : A Mathematical Account of Dynamic Texture Synthesis for Probing Visual Perception *International Conference on Mathematical NeuroScience (ICMNS)* Link

Oct. 2014 — Poster : Dynamic Textures for Probing Visual Perception *Workshop on Geometrical Models in Vision* Link

Reviewer

Conferences

Neural Information Processing Systems 2019 (NeurIPS) : Website

Limited Labeled Data workshop @ICLR 2018–2019 : Website

Journals

Image Processing On Line Journal (IPOL) : Website

IEEE Transactions on Visualization and Computer Graphics : Website

Education

2013–2017 — **PhD in Applied Mathematics** Dauphine University (Paris Sciences Lettres), Paris.

2011–2013 — **Master's degree in mathematics** *Mathematics, Vision and Learning. Graduated with honours.* École Normale Supérieure de Cachan.

2010–2011 — **Bachelor's degree in mathematics** *Applied Mathematics. Graduated with honours.* École Normale Supérieure de Cachan.

2007–2010 — **Classe Préparatoire aux Grandes Écoles (CPGE)** *Three years intensive undergraduate program - training for highly selective competitive exams to enter French engineering schools, specialized in Mathematics* Pierre De Fermat high school, Toulouse.

Teaching Activities

Oct. 2016 — **French tenured civil servant as teacher in mathematics** *Availability for postdoctoral research.*

2013–2015 — **Lecturer in Analysis, Linear Algebra, Differential Calculus** *Three hours a week. Mid to high level students.* Dauphine University, Paris.

July 2013 — **Highest mathematics competitive exam for academic teaching** *Agrégation de mathématiques. French trainee civil servant as teacher in mathematics.*

2011–2013 — **Examiner in mathematics** *Oral exam training. Two hours a week. High level students.* Classes Préparatoires aux Grandes Écoles, Janson de Sailly high school, Paris.

Professional Society Membership

since 2015 — **Société de Mathématiques Appliquées et Industrielles** Link

Awards and Scholarships

2012–2013 — **Excelence Master's Scholarship** *Funding (10 000 euros) from the Fondation de Mathématiques Jacques Hadamard (FMJH)* Link

Languages

French : native / English : fluent / Spanish : basic

Computer Science

Operating systems : Linux, Windows
Languages : Python (parallel/GPU computing), Matlab, basic knowledge in C/C++

Interests and other activities

Sports : handball, hiking, tennis, ...
Video/Board Games : hearthstone, megawatt, smallworld, 7 wonders, ...
Music, cinema, sciences, social sciences, economy, politics, ...
President of the association "Les sENS de l'Art" in 2012 : in charge of the organization of the annual art and music festival of ENS Cachan (budget : 40 000 euros).