Pierre Dérian

Curriculum Vitae

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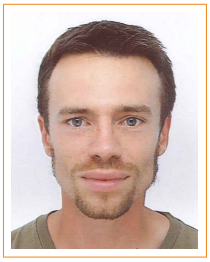
Age 31, French citizenship
Available in Nantes area, fall 2017



— PhD-engineer, applied mathematics —
scientific computing, computer vision & fluid dynamics

Experience

2016–present **Post-doctoral Researcher**, *INRIA Rennes - Bretagne Atlantique*, France.
Study of stochastic oceanic models with Etienne Mémin (Fluminance team): "transport under location uncertainty". Design of noise models for the stochastic representation of small scales unresolved by large scale oceanic models. Implementation in the NEMO european ocean engine.

2015–present **Independent Researcher / consultant**, France.
Providing scientific consulting on image processing, motion estimation and lidar data analysis. SIRET 81234779700019.

2013–2014 **Post-Doctoral Researcher**, *Atmospheric Lidar Group*, Chico, California, USA.
At the California State University, Chico under the supervision of Shane Mayor. Real-time estimation of dense 2D 2-component wind fields from aerosol backscatter lidar data (*REAL*) using computer vision techniques. Integration of my software *Typhoon*; design and implementation of the numerical aspects of the experiment (data collection and organization, processing, visualization in real-time, GPU implementations); analysis of results and documentation.

2013 **Consultant**, *Spectral Sensor Solutions (S3)*, Chico, California, USA.
Feasibility study: potential of the SAMPLE aerosol lidar for dense 2D, 2-component wind motion estimation in real time. Integration of *Typhoon* software, data analysis and documentation.

2009 **5th Year Final Project & Master Internship**, *IMFT*, Toulouse, France.
Institute of Fluid Mechanics, group EMT2. Five months, under the supervision of Marianna Brazza. *Physical analysis and numerical simulation of the buffeting around an aircraft wing at transonic speed*.

Educational Background

2009–2012 **PhD, Applied Mathematics**, *INRIA Rennes - Bretagne Atlantique*, Rennes, France.
National Institute for Research in Computer Science and Control, Fluminance team, under the supervision of Étienne Mémin. *Wavelets & Fluid Motion Estimation*: design of wavelet-based computer vision methods for fluid flows measurement and analyzis (*Typhoon* algorithm).

2009 **Master, Research in Applied Mathematics**, *IMT*, Toulouse, France.
Toulouse Mathematics Institute. Specialization in *Numerical Mathematics*.

2004–2009 **Master, Engineering in Applied Mathematics**, *INSA*, Toulouse, France.
National Institute for Applied Sciences of Toulouse, department of Mathematical & Modeling Engineering. Specialization in *Numerical Methods and Physics Modeling*.
International course ASINSA (mixed Asian/French group).

General Skills

Modeling, Simulation, High performance scientific computing.

Computer vision, Image processing, Data analysis & visualization.

Numerical methods associated to an important background in physics.

Computer Vision & Image Processing

Expertise — Image registration (motion estimation): dense variational methods and sparse correlation techniques, with real-time constraints (GPU acceleration).

Contribution — *Typhoon* software: wavelet-based motion estimation for fluid flows (C++, CUDA). `http://www.pierrederian.net/typhoon.html`

Computer Skills

Languages — Python (advanced), FORTRAN, C/C++, CUDA, SQL (good command) ; HTML, Javascript, PHP (notions).

Software — Numpy/Scipy/Matplotlib, Matlab (advanced), IDL (notions).

Systems — Development on Linux Ubuntu & Mac OS X (advanced). Version control (Git, SVN), scheduling (OAR), shell scripting, automatization and batch processing.

Languages

French — **Mother tongue**

English — **Professional Competence** *18 months in the US (2013–14), 945/990 at TOEIC (2007).*

Spanish — **Intermediate** *Conversationally fluent.*

Interests

Drawing, digital graphic arts – illustration, visualization (Processing), photography.

Personal interest for Earth Sciences.

Rock-climbing, hiking, surfing.

Selected Publications

Exhaustive list: pierrederian.net/publications.html

Journal Articles

Dérian, P and R Almar. "Wavelet-based Optical Flow Estimation of Instant Surface Currents from Shore-based and UAV Video". In: *IEEE Trans. Geosci. Remote Sens.* (in press, 2017).

Dérian, P, C. F. Mauzey, and S. D. Mayor. "Wavelet-based optical flow for two-component wind field estimation from single aerosol lidar data". In: *J. Atmos. Ocean. Technol.* 32 (2015), pages 1759–1778.

PhD Thesis

Dérian, P. "Wavelets and Fluid Motion Estimation". PhD thesis. MATISSE, Université Rennes 1, 2012.