

Alexis Roche

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French National | Married, 2 Children

Professional Profile

Hands-on scientific team leader, graduated from École Centrale Paris, PhD in engineering science, with a specialist expertise in computer vision and machine learning. Has operated in academic research for 15 years before moving to R&D in industry (healthcare, electro-domestic, entertainment). Strong experience in the development of both open source and commercial software in Python, C, C++. *Keywords:* applied mathematics, statistics, artificial intelligence, machine learning, computer vision, medical image analysis, clinical studies, computer graphics.

Key Skills

STATISTICAL MODELING: Strong experience developing model-based algorithms for statistical inference, with applications in machine learning, computer vision, computer graphics, ...

TECHNICAL LEADERSHIP: Proven ability to coordinate a team and manage objectives in multidisciplinary environments.

SCIENTIFIC COMPUTING: 15 years experience in Python programming within the NumPy/SciPy ecosystem and interfacing C language with Python.

SCIENTIFIC WRITING: Main author of 25 peer-reviewed scientific articles published in international journals, proceedings and books, co-author of more than 100 scholarly publications and 5 published international patents.

Career Summary

HEAD OF COMPUTER VISION & ARTIFICIAL INTELLIGENCE
Didimo, Porto, Portugal

2019–present

- Leading development of algorithms for automated generation of high-fidelity digital humans from photos. *Keywords:* facial reconstruction, “deep face”, animation retargetting, image enhancement.

SENIOR COMPUTER VISION SCIENTIST
CoVii, Arçelik/Beko group, Porto, Portugal

2017–2019

- Developed embedded algorithms for smart domestic appliances (VUXHub and Artisan intelligent oven prototypes demonstrated at IFA Berlin, 2017–18). *Keywords:* image classification, object recognition & tracking, deep learning.

LEAD CLINICAL RESEARCH – ADVANCED CLINICAL IMAGING TECHNOLOGY
Siemens Healthineers / Lausanne University Hospital (CHUV), Switzerland

2011–2017

- Led algorithmic development of a brain morphometry tool (released as part of the *AI-Rad Companion* Siemens solutions) to help radiological reading for patients with suspected neurodegeneration. *Keywords:* magnetic resonance imaging (MRI), brain image segmentation, machine learning for disease classification.
- Main organizer of annual Siemens/CHUV *brain imaging* workshops in Lausanne, Switzerland, 2012–2016.

PERMANENT RESEARCHER – NEUROIMAGING INSTITUTE
French Atomic Commission (CEA), Paris, France

2002–2011

- Developed advanced algorithms for image processing and statistical analysis of brain imaging data. *Keywords*: functional, anatomical and diffusion-weighted MRI, image-based population analysis, spatio-temporal image registration, real-time imaging.
- Funded project management: principal investigator (*Karametria* – statistical analysis of brain structures, French National Research Agency project, budget: 620 K€, 2009–2011); team leader (*NIBB* – studying language in infants via functional neuroimaging, French National Research Agency project, 2006–2009).
- Active contributor to the NiPy software library (Neuroimaging in Python, www.nipy.org) from 2006.
- Academic Guest at Computer Vision Laboratory, Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland, 2009–2011.

POST-DOCTORAL RESEARCHER – WOLFSON MEDICAL VISION LABORATORY
University of Oxford, UK

2001–2002

- Developed advanced medical image registration algorithms.
- Consulting for Mirada Solutions Ltd (now Siemens Molecular Imaging) on image-based deformation tracking (brain, liver).

PhD CANDIDATE – EPIDAURE PROJECT
French National Research Institute (INRIA), Sophia Antipolis, France

1997–2001

- Development of multimodal image registration algorithms, with applications in radiotherapy, image-guided surgery and neuroscience.

CONTINGENT SCIENTIST – FRENCH NATIONAL SERVICE
General Directorate for Armament (DGA), Vernon, France

1996–1997

- Developed plane trajectory simulator using stochastic process models.

Education

PhD, Engineering Science (1997–2001) | University of Nice-Sophia Antipolis, France

- With highest honor.

MSc, Cognitive Science (1995–1996) | University Pierre & Marie Curie, Paris VI, France

- Internship at Experimental Psychology Laboratory, National Center for Scientific Research (CNRS), Paris, France, on modeling human perception of tempo using artificial neural networks.

Engineer Degree (equivalent MSc) (1993–1996) | Ecole Centrale Paris, France

- Third year specialization in Applied Mathematics.

Additional information

Languages:	Native French, fluent English, basic Italian & Portuguese.
IT skills:	<ul style="list-style-type: none">• Programming languages: Python, C, C++, Matlab, R.• Long-term experience with scientific Python packages (numpy, scipy, pylab).• CV/AI Python packages: skimage, PIL, opencv, sklearn, pytorch, tensorflow, keras.• C/Python integration via Cython.• Version control software: git, svn, perforce.• Agile workflow (mainly Scrum) using JIRA & Confluence.• Reporting: \LaTeX, MS Office, OpenOffice, LibreOffice, Google Docs.
Publications:	<ul style="list-style-type: none">• ORCID: http://orcid.org/0000-0002-4821-6893.• 115 scholarly publications.• Google scholar statistics: 6862 citations, h-index: 33, i10-index: 68 (March 2022).• 5 published international patents. 2 ongoing applications.
Academic work:	<ul style="list-style-type: none">• Post-graduate teaching in computer vision and medical image analysis: about 100 hours (Ecole Centrale Paris, EPFL Lausanne, University of Nice, University of Lausanne, INSERM/CNRS continuing education, ...).• Long-time scientific journal reviewing experience (IEEE Trans. Medical Imaging, Medical Image Analysis, NeuroImage, IEEE Trans. PAMI, IEEE Trans. Signal Processing, Frontiers in Neuroscience, ...).• Supervision: two PhD students and four MSc students as main supervisor, three PhD students and two MSc students as co-supervisor.
References:	Available on request.