

Alexis Roche

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French National | Married, 2 Children
Based in Porto, Portugal.

Professional Profile

Hands-on technical team leader, applied researcher and engineer at heart, PhD, with a specialist expertise in computer vision and artificial intelligence. Has operated in public research and private R&D in various fields (healthcare, electro-domestic, entertainment). Strong experience in the development of both open source and commercial software. *Keywords:* applied mathematics, statistics, machine learning, computer vision, computer graphics, computer-aided diagnosis, smart appliances, digital avatars, Python, C.

Key Skills

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

COMPUTATIONAL STATISTICS: 25 years experience developing inferential statistical models for machine learning, computer vision, computer graphics, ...

SCIENTIFIC PROGRAMMING: 15 years experience programming in Python and C language in the SciPy ecosystem.

SCIENTIFIC REPORTING: Author of more than 100 peer-reviewed scientific articles published in international journals, proceedings and books, and 6 published international patents.

Career Summary

HEAD OF ARTIFICIAL INTELLIGENCE
Didimo, Porto, Portugal

2019–present

- Leading development of generation pipeline of high-fidelity avatars from photos. *Keywords:* facial reconstruction, deep face, animation retargeting, image processing. Accepted talk at SIGGRAPH'22.

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 computer-aided diagnosis software (released by Siemens Healthineers as part of the *AI-Rad Companion* solution) using brain morphometry for radiological reading. *Keywords:* magnetic resonance imaging (MRI), brain image segmentation, disease classification, neurodegeneration, Alzheimer's disease.

- Main organizer of annual Siemens/CHUV *brain imaging* workshops in Lausanne, Switzerland, 2012–2016.

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

2002–2011

- Developed advanced algorithms for image processing and statistical analysis of brain imaging data. *Key-words*: 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 Portuguese & Italian.
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: L^AT_EX, MS Office, OpenOffice, LibreOffice, Google Docs.
Publications:	<ul style="list-style-type: none">• ORCID: http://orcid.org/0000-0002-4821-6893.• 116 scholarly publications.• Google scholar statistics: 7603 citations, h-index: 35, i10-index: 74 (May 2023).• 6 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 (France: Ecole Centrale Paris, University of Nice, INSERM/CNRS continuing education; Switzerland: EPFL Lausanne, University of Lausanne).• 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 of two PhD students and four MSc students as main supervisor, three PhD students and two MSc students as co-supervisor.
References:	Available on request.