Alexis Roche

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

Professional Profile

Hands-on technical team leader, engineer at heart, PhD, with a specialist expertise in artificial intelligence and data analysis. 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 in Python, C, C++. *Keywords:* applied mathematics, statistics, machine learning, computer vision, computer graphics, medical image analysis, clinical studies.

Key Skills

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

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

STATISTICS: Strong experience developing inferential statistical models for machine learning, computer vision, computer graphics, and performing data analysis for cognitive research, clinical studies, software validation, ...

SCIENTIFIC REPORTING: 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 DIDIMO AUTOMATION TEAM — **2019–present**
Didimo, Porto, Portugal

- Leading development of generation pipeline of high-fidelity avatars from photos. *Keywords:* facial reconstruction, "deep face", animation retargetting, image feature extraction, image restoration.

SENIOR COMPUTER VISION SCIENTIST — **2017–2019**
CoVii, Arçelik/Beko group, Porto, Portugal

- 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 — **2011–2017**
Siemens Healthineers / Lausanne University Hospital (CHUV), Switzerland

- 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 – NEUROSPIN (NEUROIMAGING INSTITUTE) **2002–2011**
French Atomic Commission (CEA), Paris, France

- 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 **2001–2002**
University of Oxford, UK

- 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 **1997–2001**
French National Research Institute (INRIA), Sophia Antipolis, France

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

CONTINGENT SCIENTIST – FRENCH NATIONAL SERVICE **1996–1997**
General Directorate for Armament (DGA), Vernon, France

- 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:
- 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:
- ORCID: `http://orcid.org/0000-0002-4821-6893`.
- 116 scholarly publications.
- Google scholar statistics: 7308 citations, h-index: 35, i10-index: 72 (October 2022).
- 5 published international patents. 2 ongoing applications.

Academic work:
- 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.