

Nicholas AYACHE

(updated January 2012)

Born in Paris 1st November 1958 French Nationality, married, 3 children
Work : INRIA, 2004 Route des Lucioles, 06902 Sophia-Antipolis, France
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Current Research Interests Computational Medical Image Analysis and Simulation to assist medical diagnosis and therapy ; Computational Anatomy and Physiology ; Personalized Digital Patient ; Virtual Anatomical and Physiological Human ; Design of innovative systems for Surgery Simulation and Image-Guided Therapy. Computational Models of Living Systems including geometrical, statistical, physical and functional components personalized from images.

Education

- 1980 : *Ingénieur Civil des Mines* (Engineer Degree), Saint-Etienne
- 1981 : *Master of Science*, Artificial Intelligence, University of California, Los Angeles
- 1983 : *Docteur Ingénieur (PhD)*, Object Recognition & Robotics, Univ.Paris XI (Orsay), with honors.
- 1988 : *Docteur d'Etat (Habilitation)*, Artificial Vision & Robotics, Univ. Paris XI (Orsay), with honors.

Professional Academic Experience

- 2006–present : **Research Director** of Class Exceptional (DR0) at **INRIA** (Asclepios Team).
- 1985–2010 : **Associate Professor** at **Ecole Centrale Paris**.
- 2005–2007 : **VP for Science** of INRIA Sophia-Antipolis Center (500 employees, 30 research groups).
- 2001–2005 : Deputy VP for Science of INRIA Sophia-Antipolis Unit, member of Steering Committee.
- Aug-Dec 2007 : Invited Scientist at **MIT** (CSAIL), **Harvard** (Biorobotics) and **Brigham & Women's Hospital** (Boston).
- 1989–2005 : Research Director and Group Leader at INRIA (project EPIDAURE).
- 1981–1989 : Senior Researcher at INRIA (project ROBOTVIS)

Publications, Patents, Softwares

- **9 books** : including a monograph (341 pages) published by MIT Press (English) and Masson (French).
- over **400 international publications** including *137 Journals* • *242 peer-reviewed and archived conference articles* • *31 book chapters* or invited articles • *12 patents*.
- **17,688 citations** ; **h-index : 72** ; (Google Scholar : <http://scholar.google.com/citations?user=29XL16UAAAAJ>)
- Author of several softwares in shape recognition, computational stereovision, image and medical image analysis.
- Several popular software modules or libraries developed by our research team, including for instance MedINRIA, CardioViz, SepINRIA, Demons Registration, etc., many of them are publicly available. A recent list at <http://www-sop.inria.fr/asclepios/software.php>

Editorship (selection)

- 1995–present : **Co-Editor in Chief** (and Co-Founder) of *Medical Image Analysis* journal (*Elsevier Science*).
- 1992–present : **Associate Editor** of *Trans. on Medical Imaging (IEEE)*.
- 2000–present : **Editorial Board** of **Computer Assisted Surgery** (Wiley)
- 2010–present : **Associate Editor** of **SIAM Journal on Imaging Sciences**, Springer.
- Editorial Board of *Math. Modeling and Num. Analysis, EDP Sc. and SMAI* (2006-2008).
- Editorial board of *International Journal on Computer Vision, Kluwer* (1992–2004),
- Editorial board of *Transactions on Robotics & Automation, IEEE* (1988–1993)
- Editorial board of *Computer Vision, and Image Understanding, Academic Press* (1994-97) ;
- Advisory Editor of *Medical Imaging Technology* (1995-) and *Videre, MIT Press* (1996-2000)

Supervision of PhD Students

- Supervisor or Co-Supervisor of **53** PhD Students who graduated between 1992 and 2011, of **11** PhD Students currently preparing their PhD, of **5** past Habilitations.

Prizes and Distinctions (selection)

- 2011 : Awarded a prestigious **ERC** (European Research Council) advanced grant (MedYMA 2012-2017).
- 2009 : Elected *Fellow of the MICCAI Society* (Med. Image Comping & Comp. Assist. Intervention), London.
- 2008 : **Microsoft Prize for Science in Europe**, awarded by Royal Society and French Academy of Sciences
- 2008 : *MICCAI 2008 : Significant Researcher Award*, awarded at the MICCAI conference in New-York.
- 2008 : Elected to College of **AIMBE** (American Inst. for Med. & Biol. Engineering), NAS, Washington DC.
- 2007 : Designated *Best Researcher of the year* (PACA Region) by *Nouvel Economiste* Newspaper
- 2006 : **Grand Prize EADS, French Academy of Sciences**
- 2005 : Appointed *Research Director of Class Exceptional* (DR0) by INRIA.
- 1999 : *Laval Virtual award* for the introduction of surgery simulators and virtual reality in medicine. (with G. Subsol, H. Delingette, G. Picinbono, S. Cotin).
- 1996 : *European Computer Vision award* for industrial transfer, Vienna (with J.P. Thirion, G. Malandain, J. Feldmar et J. Declerck).

Nominations to Scientific Councils (selection)

- 2012– : *Chief Scientific Officer (CSO)* of **Institut Hospitalo-Universitaire (IHU)** of Strasbourg
- 2010– : *Advisory Board of Medical Engineering Centre*, St. Thomas Hospital & KCL, London
- 2010– : Member of the *Visiting Committee* of the Sino-French institute **LIAMA** in Beijing.
- 2009-2012 : Member of the *Advisory Committee* of the Japanese Initiative (**MEXT**) in Computational Anatomy.
- 2008– : Member of the *Scientific Council* of the French *Inst. of Technologies for Healthcare* of **INSERM**.
- 2006– : Member of the *Sectorial Committee* for *Biology and Health* of **ANR** (French Agency for Research)
- 2006–2008 : Member of the *Steering Committee* of the French Research Program on Imaging of **INSERM**.
- 2004– : Member of the *High Scientific Council* for **France-Israel** Cooperation.
- 2004– : Member of the *Advisory Committee*, **Shun Hing Institute** of Advanced Engineering (Hong-Kong).
- 2003-2005 : Member of the *Strategic Council* of **Pop-Sud**.
- 1998–2000 : Member of *Scientific Council* of **Cognitique**, Ministry of Research.
- 1995–1998 : Member of *Scientific Council* of **GIS Cognition** Ministry of Research.
- 1997 : Member of *Scientific Council* of **TIMC** (Grenoble).
- 1992-1997 : Member of *High Council* for **Scientific and Technical Police**(15 members), Ministry of Interior.

Best Paper Awards (selection)

- 2011 : Best paper award at **FIMH'2011** (with Herve Lombaert et al.)
- 2010 : Nomination for Best paper award at **MICCAI'2010** (with E. Geremia et al.)
- 2008 : Best paper award at *MICCAI'2010 Workshop* (with M. Lorenzi et al.)
- 2008 : Best paper award at **MICCAI'2008** (with S. Durrleman, X. Pennec, P. Thompson and A. Trouvé).
- 2008 : Best paper award at 8th **IEEE EMBS Summer School**, Berder (with Thomas Mansi et al.).
- 2008 : Nomination for Best paper award at **MICCAI'2008** (with Thomas Yeo et al.)
- 2007 : Nomination for Best paper award at **MICCAI'2007** (with Tom Vercauteren et al.)
- 2006 : Best **MICCAI/MedIA** article Prize (with T. Vercauteren, A. Perchant, G. Malandain, X. Pennec.)
- 2006 : Best paper award at **Art. Motion and Def. Objects Conf.** (with J. Boisvert, X. Pennec, and F. Chériet).
- 2003 : Best paper award at **MICCAI'2003** (with V. Arsigny et X. Pennec).
- 2001 : Best paper award at **Robotics & Automation** (with H. Delingette et G. Picinbono).
- 1991 : Best paper award at **RFIA 1991** (with A. Guézic).

Distinguished Dissertations of supervised PhD Students (selection)

- 2010 : S. Durrleman received the second *Gilles Kahn* Prize, awarded by Specif and French Academy of Sciences.
- 2009 : J. Boisvert received the best thesis award among PhDs co-supervised between *France and Quebec*.
- 2009 : P. Fillard received a special mention for best PhD in Biomedical Engineering from *SFGBM-IEEE* France.
- 2008 : O. Clatz received a special mention for best PhD in Biomedical Engineering from *SFGBM-IEEE* France.
- 2007 : V. Arsigny received the second *Gilles Kahn* Prize, awarded by Specif and French Academy of Sciences.
- 2007 : O. Clatz received a best thesis award from the newspaper *Le Monde*.
- 2004 : C. Forest received a best thesis award from the newspaper *Le Monde*.
- 2003 : M. Sermesant received the second *SPECIF* award and the third *Télécom Valley* award.

Teaching

- Ecole Centrale Paris since 1985;(joint course with ENS Cachan)

- Univ. Nice Sophia-Antipolis (1996–2000) ; Paris XI (Orsay) (1988–2000) ; ENSTA (1990–97) ; Ponts et Chaussées (1990-97) ; Mines de Paris (1991-96) ; INSTN (1990-92).

Start-up Companies

- **co-founder of 4 industrial companies :**
 1. **Noesis** (general image processing, 1985),
 2. **Realviz** (special effects and image processing, 1998),
 3. **Mauna Kea Technologies** (biomedical molecular imaging, 2000),
 4. **QuantifiCare** (medical image processing, 2001).

Scientific Consulting for Industry (selection)

- 1985–2000 : Consultant for *Matra*, then *Matra-MS2I*, *Matra Cap Systèmes* and *Matra S&I*.
- 1995–2001 Consultant for *Aleph Medical*, then *Focus Medical* and *Focus Imaging*.
- 2001– : Consultant for *Mauna Kea Technologies*

Organization of Conferences (selection)

- **General Chair** of **MICCAI 2012** (Medical Image Computing and Computer Ass. Intervention), Nice, France.
- **Conference Chair** of **FIMH 2009** (Functional Imaging and Modeling of the Heart), Nice.
- **Program Chair** of **MICCAI 2007** (Medical Image Computing and Computer Ass. Intervention), Australia.
- *Co-Founder and Co-Organizer* of *Jacques Morgenstern Colloquium* since 2003 (with J.D. Boissonnat)
- *Area Chair* of MICCAI 2005, MICCAI 2003
- Co-founder and board member of the scientific *MICCAI Society* since 2004
- **Conference Chair** of **IS4TM**, 1st Int. Symp. on *Surgery Simul. and Soft-Tissue Modeling*, 2002 (with H. Delingette).
- **Conference Chair** of **CVRMed95**, First Int. Conference on Computer Vision, Virtual Reality and Robotics in Medicine, Nice, 1995.
- *Conference Chair* of *Biomedical Modeling and Simulation*, Caesare Center, Bonn, 2001 (with E. Keeve).
- *Area-Chair* of *Multimedia and Biomedical Applications* track of **ICPR'2002**, Canada (with L. Shapiro).
- member of program committees of major conferences in image processing, computer vision, and medical image analysis (ICCV, ECCV, CVPR, ICPR, RFIA, CVRMed, IPMI, VBC, MICCAI, ISBI etc.).

Plenary and Keynote Invited Lectures (Selection)

- *Kyushu University*, Fukuoka, Japan, invited keynote lecture, March 2012.
- *Academy of Sciences*, Rabbat, Morocco, Feb 2012
- *Technion 100 year anniversary*, Maison de la Chimie, Paris Dec 2011
- *French Academy of Medecine*, Paris Nov 2011
- *Physiome International Course*, Oxford University, UK, July 2011
- *ICCU Conference*, Nice, FR, April 2011
- *Tata Institute*, Mumbai, India, Feb 2011
- *Royal Society*, London UK, Nov 2010, Plenary lecture, part of *Computational Frontiers of Scientific Discovery*
- *Oxford University*, Sep 2010, keynote speaker at the celebration of 65th birthday of Sir Professor Mike Brady
- *Ecole Centrale Paris*, Oct 2010, Plenary Lecture, Part of *Scientific Challenges in Health, Biology and IT*
- *INRIA Sophia Antipolis*, June 2010, keynote speaker to celebrate 60th birthday of Professor Olivier Faugeras
- *Inria-Industry annual meeting*, Bordeaux, April 2010, introductory plenary lecture
- *Tokyo University and MEXT*, Japan, Feb 2010, plenary lecture.
- *Osaka University*, Japan, invited plenary lecture, Feb 2010.
- *Isaac Newton Institute*, Cambridge (UK), 2009, plenary lecture.
- *French Academy of Sciences*, Paris, France, 2009, plenary lecture, part of *Scientific Challenges of 21st century*.
- *Medical Imaging Conference*, 2009, Orlando, USA, keynote lecture.
- *Molecular Imaging Summer School*, Lipari (I), 2009, plenary lecture.
- *College de France*, 2008, plenary lecture.
- *Mayo Clinic*, Rochester, USA, 2007, plenary lecture.
- *Brigham and Women's Hospital*, Monthly Seminars of Radiology, Boston, USA, 2007, plenary lecture.
- *French Academy of Sciences, special session in Nice, 2006*, plenary lecture.
- *Triangle Computer Science Distinguished Lecturer Series*, Chapel Hill, 2006.
- *Haemodol Conference on Computational Physiological Fluids*, Bergamo Italy, 2006, keynote speaker.

- *Shun Hing Institute* , Distinguished Speaker, Hong-Kong, 2005.
- *First Robotics Science Conference*, keynote speaker, MIT, Boston, 2005, keynote lecture.
- *Medical Image Understanding and Analysis Conference*, keynote speaker, Bristol, 2005.
- *Computer Vision and Medicine Symposium*, invited speaker, Beijing, China, 2005.
- *Computer-Aided Surgery, Medical Robotics, and Medical Imaging*, Keynote, Tel Aviv, Israel, 2005.
- *Visiting Committee of INRIA*, Paris, 2004, plenary lecture.
- *Maison Francaise of Oxford*, UK, 2004, plenary lecture.
- *Mathematics in Brain Imaging*, UCLA, Los-Angeles, 2004, plenary lecture.
- *Medical Imaging and Augmented Reality*, keynote speaker, Beijing, 2004.
- *Jacques Morgenstern Colloquium*, INRIA Sophia-Antipolis, 2004, plenary lecture.
- *Institut Pasteur*, Paris, 2003.
- *Image Guided Surgery Workshop*, keynote, Nuremberg, Germany, 2003.
- *Computer Aided Radiology and Surgery Conference*, London, 2003.
- *Computer Analysis of Image Patterns Conference*, keynote, Groningen, Netherlands, 2003.
- *Jikei University*, keynote, Tokyo, 2003.
- *Digital Image Computing and Texture Analysis*, keynote, Sydney, Australia, 2003.
- *Ilitech : Computer Science and Health*, Rocquencourt, 2003.
- *Int. Symp. on Biomedical Imaging, from Nano to Macro*, Washington DC, 2002.
- *The Virtual Human Body - State of the Art and Visions for Medicine*, keynote, Hambourg, 2002.
- *Computer Aided Radiology*, Palais des Congrès, Paris, 2002.
- *Imagerie Médicale et Santé*, Centre Cycéron, Caen, 2002.
- *Biomedical Modeling and Simulation*, keynote, Caesare Center, Bonn, 2001.
- *Model Driven Acquisition* (organized by Academy of Sciences, Grenoble, 2000).
- *Machine Vision and Applications*, keynote, (Tokyo, 2000).
- *Mathematics and Image Analysis*, keynote, (Paris, 2000).
- *Mathematical Methods in Biomedical Imaging*, keynote, (USA, 2000).
- *Applications du Magnétisme en Médecine*, keynote, (Lille, 2000).
- *Académie des Sciences* (Paris, 1999), plenary lecture.
- *Visit of Président de la République (French President)* (INRIA-Rocquencourt, 1999).
- *IEEE Image Analysis and Processing*, keynote, (Venise, 1999).
- *Scandinavian Conference on Image Analysis*, keynote, (Greenland, 1999).
- *Computer-Aided Surgery, Medical Robotics, and Medical Imaging*, keynote, (Jérusalem, 1999).
- *Medicine Meets High Technology* (Munich, 1998), plenary lecture.
- *International Conference on Pattern Recognition*, keynote, (Australia, 1998).
- *Asian Conference on Computer Science* (Népal, keynote, 1997).
- *British Machine Vision Conference* (Birmingham, 1995), keynote.

Other invited lectures (selection)

- Content-Based Medical Image Retrieval WS, *Miccai, Toronto, Canada, keynote lecture, Sept 2011.*
- JiaoTong University, *Shanghai, China, invited lecture, Nov 2010.*
- Nagoya University, *Japan, invited lecture, Feb 2010.*
- Gifu University, *Japan, invited lecture, Feb 2010.*
- Technical University of Munich (TUM), *invited lecture, Oct 2010.*
- Cercle des industriels, *French Academy of Sciences, Paris, France, 2009.*
- ETSI/ERCIM *Virtual Physiological Heart, Sophia Antipolis, France, 2009.*
- NCRI Conference, invited talk, *Birmingham, UK, 2008.*
- VBM Conference, Keynote lecture, *Delft, The Netherlands, 2008.*
- ICT for Health, invited talk, *Paris, 2008.*
- Colloquium Philips Research, invited talk, *Aachen, Germany, 2008.*
- Martinos Center, Massachusetts General Hospital, *Boston, USA, 2007.*
- CSAIL at MIT, *Cambdridge, USA, 2007.*
- Electrical Engineering Department at Harvard, *Cambdridge, USA, 2007.*
- Microscopic Biological Image Processing Workshop, *Copenhagen 2006.*
- Siemens Princeton, *2005*
- Ecole Polytechnique, *Palaiseau, France, 2004*
- Toshiba Medical Systems, *Tokyo, 2002.*
- Surgery Simulation, *Course on Modeling in Medicine, Siggraph'00, New-Orleans, USA, july 2000.*
- European Endoscopic Gynaecological Surgery, *Paris, 2000.*

- Rencontres France-Israel, *Marseille, 2000.*
- Workshop on Medical Robotics, *International Conference on Robotics and Automation, San-Francisco, 2000.*
- Workshop on 3-D Shape Modeling, *International Conference on Robotics and Automation, San-Francisco, 2000.*
- Surgery Simulation, *Course on Modeling in Medicine, Siggraph'99, Los-Angeles, USA, August 1999.*
- Medical Resarch Seminar, *Sheba Medical Center, Tel-Aviv, Israel, 1999.*
- Séminaire Service Hospitalier Frédéric Joliot, *CEA, Orsay, 1999.*
- Journées TIC-Relations internationales, *CERAM, Sophia-Antipolis, 1999.*
- La recherche en direct, *Inria-Sophia-Antipolis, 1999.*
- Nouvelles technologies, nouveaux usages, nouveaux métiers, *Fondation Sophia-Antipolis, 1999.*
- NIH workshop against Cancer, *Boston, Octobre 1998.*
- Tutorial on Soft Tissue Modeling, *Boston, Octobre 1998.*
- 1st European Workshop on Neuroinformatics of the Human Brain, *Stockholm, 1997*
- National Science Foundation, *Workshop on Neurosciences, Washington, 1995.*
- Anniversaire des 10 ans de Noesis, *1995.*
- Eppendorf Hospital, *Hamburg, 1995.*
- Institute of Systems Science, *Singapour, 1994.*
- Brigham and Women's Hospital, *Harvard, 1994.*
- IEEE 1st International Summer School on 3D Biomedical Imaging, *Ile de Berder, 1994*
- Ecole Polytechnique de Lausanne, *1993 et 1995.*
- International Symposium on Robotics Research, *Pittsburgh, 1993.*
- Digital Equipment Corporation, *Boston, 1990.*
- Beijing, Shangai et Nankin Universities, *1989.*
- Harvard Medical School, *1989*
- MIT, AI Lab, *1989.*

Supervision or Co-Supervision of PhD Theses (name, year of defense, position after defense)

1. *I. Cohen* (Dauphine 92), *Assistant Professor*, Univ. Southern California (USA).
2. *G. Malandain* (Centrale 92), *Research Director*, INRIA-Sophia.
3. *A. Guézic* (Orsay 93), *Senior Scientist*, IBM, Yorktown-Heigts, USA.
4. *J.L. Jézouin* (Orsay 91). *Matra.*
5. *R. Vergnet*, *Matra, France.*
6. *J.P. Berroir* (Dauphine 93), *Researcher at INRIA-Rocquencourt.*
7. *S. Benayoun* (Dauphine 94), *Engineer.*
8. *C. Nastar* (Ponts 94), *Founder and Director of Look-That-Up, Paris.*
9. *H. Delingette* (Centrale 94), *Research Director, INRIA-Sophia.*
10. *A. Gourdon* (Orsay 95). *Engineer Sophia-Antipolis.*
11. *E. Bardinnet* *Research engineer CNRS, Pitié Salpêtrière..*
12. *J. Feldmar* (Polytechnique 95). *Co-Funder OMIA (Oxford) et Look-That-Up (Paris).*
13. *G. Subsol* (Centrale 95), *researcher CNRS, Montpellier.*
14. *S. Fernandez-Vidal* (Nice 96), *Chargée de Cours Univ. Nice.*
15. *D. Canu* (Orsay 96), *Matra.*
16. *M. Fidrich* (Orsay 96) *GE Budapest, Hungary.*
17. *X. Pennec* (Polytechnique 96), *Researcher at INRIA Sophia-Antipolis.*
18. *M. Bro-Nielsen* (Denmark 97), *VR-Technologies (USA), NetDoktor (Scand.), Radiometer (Venture Funds).*
19. *S. Cotin* (Nice 97), *Senior Scientist, CIMIT, Boston*
20. *J. Declerck* (Centrale 97). *Senior Scientist, OMIA, Oxford.*
21. *L. Soler* (Orsay 98), *Research Director, IRCAD (Strasbourg).*
22. *A. Guimond* (Montreal 1999), (Dir. JP. Thirion). *Research engineer OMIA (Oxford), Dosisoft (Paris).*
23. *K. Krissian* (ENS Cachan 2000) *Researcher at Surgical Planning Laboratory, BW Hospital, Boston.*
24. *J. Montagnat* *CNRS Researcher, Nice.*
25. *G. Picinbono* (Nice, 2001), *Engineer CSTB (Sophia).*

26. *S. Prima* (Orsay, 2001), Researcher at IRISA, Rennes.
27. *A. Roche* (Centrale, 2001), Research Scientist, CEA, Orsay.
28. *P. Cachier* (Centrale 2002) Medical Imaging Engineer, Median company, Sophia-Antipolis.
29. *S. Ourselin* (Nice, 2002) Research Scientist at CSIRO, Sydney, Australia, and UCL (London).
30. *D. Rey* (Nice, 2002). Software Engineer at INRIA Sophia-Antipolis.
31. *J. Stoeckel* (Nice, 2002) Research Engineer at Siemens.
32. *C. Forest* (Nice, 2002) Research Engineer at IRCAD, Strasbourg.
33. *Maxime Sermesant* (Nice, 2002), Assistant Prof. (London) and Inria researcher, Sophia-Antipolis.
34. *G. Flandin* (Nice and CEA, 2003) Post-doctoral researcher, University College, Londres.
35. *S. Nicolau* (Nice, 2003) Research Engineer at IRCAD, Strasbourg.
36. *A. Pitiot* (Nice and UCLA, 2004) Mirada-Solutions, Oxford.
37. *V. Moreau* (2004) Assistant professor, Nice.
38. *R. Stefanescu* (2005) Engineer.
39. *G. Dugas-Phocion* (2005) Engineer.
40. *O. Clatz* (2005) Research Scientist, Harvard Medical School, Boston and INRIA Researcher, Sophia-Antipolis.
41. *V. Arsigny* (2006), Regional Research and Development Council for Haute-Normandie, France.
42. *O. Commowick* (2007, Director G. Malandain), Post-Doc, Children's hospital, Boston, USA.
43. *J. Boisvert* (2008), Post-Doctorate, Biomedical Imaging, Canada.
44. *M. J. Costa* (2008), Medical Imaging, Siemens Medical Solutions, Erlangen, Germany.
45. *P. Fillard* (2008), Neuroscience Imaging, Neurospin, Paris.
46. *T. Vercauteren* (2008), Microscopic Biomedical Imaging, Mauna Kea Technologies, Paris.
47. *J.C. Souplet* (2009), Research scientist, Orleans Hospital, France.
48. *E. Konukoglu* (2009), Research Scientist, Microsoft Research, Cambridge, UK.
49. *J-M. Peyrat* (2009), Research Engineer, Siemens Medical Solutions, Oxford, UK.
50. *S. Durrleman* 2010, Research Scientist, Science Imaging Institute, Univ. of Utah, USA.
51. *F. Billet* 2010, Research Engineer, University Hospital (CHU), Grenoble.
52. *T. Mansi* 2010, Research Scientist, Siemens Corporate Research, Princeton, USA.
53. *B. Andre* 2011, Research Engineer, Mauna Kea Technologies, Paris.

Supervision or Co-Supervision of current PhD theses (planned year of defense)

1. *T. Benseguir* (2014)
2. *M. Breuilly* (2012)
3. *R. Cabrera Lozoya* (2015)
4. *A. Le Carvennec* (2014)
5. *E. Geremia* (2011)
6. *V. Gupta* (2014)
7. *L. Le Folgoc* (2014)
8. *M. Lorenzi* (2012)
9. *S. Marchesseau* (2012)
10. *Jan Margeta* (2014)
11. *A. Prakosa* (2011)
12. *J. Relan* (2011)
13. *E. Stretton* (2013)

Publications of Nicholas Ayache (updated Jan 2012)

An up-to-date list of over 400 peer-reviewed publications is available at the following URL :
<http://www-sop.inria.fr/asclepios/biblio/REP/publi.php?name=Author/AYACHE-N.html>

Books

1. *Biomedical Image Analysis : Methodologies And Applications* N. Paragios, J. Duncan, and Nicholas Ayache, editors - Springer, 1st edition 2010. Note : ISBN : 978-0-387-09748-0, 590 pages.
2. *Functional Imaging and Modeling of the Heart - FIMH 2009*, Springer. N Ayache, H Delingette, and M Sermesant, editors, volume 5528 of LNCS, Nice, France, 537 pages, June 2009.
3. *Medical Image Computing and Computer-Assisted Intervention - MICCAI 2007 - N. Ayache, S. Ourselin, and A. Maeder, editors. Part I*, volume 4791 of LNCS, Brisbane, Australia, October 2007, 1001 pages. Springer.
4. *Medical Image Computing and Computer-Assisted Intervention - MICCAI 2007 - N. Ayache, S. Ourselin, and A. Maeder, editors. Part II*, volume 4792 of LNCS, Brisbane, Australia, October 2007, 977 pages. Springer.
5. *Computational Models of the Human Body*, N. Ayache, Volume Editor, Handbook of Numerical Analysis, (P. Ciarlet Series Editors), 670 pages, Elsevier, 2004.
6. *Surgery Simulation and Soft Tissue Modeling*, N. Ayache and H. Delingette, Editors, Lecture Notes in Computer Science (volume LNCS 2673), Springer-Verlag, 386 pages, 2003
7. *Computer Vision, Virtual Reality and Robotics in Medicine (CVRMed'95)*, N. Ayache, Editor, Lecture Notes in Computer Science, Springer-Verlag, No 905, 567 pages, 1995. (N. Ayache).
8. *Artificial Vision for Mobile robots — Stereo-vision and Multisensor Perception*, 342 pages, MIT-Press, 1991. (N. Ayache).
9. *Vision Stéréoscopique et Perception Multisensorielle : Application à la robotique mobile*, Inter-Editions-Masson, Collection Science Informatique, directed by G. Huet, 341 pages, Mai 1989. (In French). (N. Ayache).

Book Chapters and Invited Articles (selection)

1. Optimal control in image processing, chapter Image-based modeling of tumor growth in patients with glioma. Springer, 2011. Bjoern Menze, Erin Stretton, Ender Konukoglu, and Nicholas Ayache.
2. Personalization of Reaction-Diffusion Tumor Growth Models in MR Images : Application to Brain Gliomas Characterization and Radiotherapy Planning. In Thomas S. Deisboeck and Georgios Stamatakos, editors, Multiscale Cancer Modeling. CRC Press, 2010. Ender Konukoglu, Olivier Clatz, H. Delingette, and Nicholas Ayache
3. Asclepios : a Research Project-Team at INRIA for the Analysis and Simulation of Biomedical Images. In From semantics to computer science : essays in honor of Gilles Kahn. Cambridge University Press, 2009. (N. Ayache, O. Clatz, H. Delingette, G. Malandain, X. Pennec, and M. Sermesant.)
4. Virtual Pulmonary Valve Replacement Interventions with a Personalised Cardiac Electromechanical Model. In Recent Advances in the 3D Physiological Human. Springer, 2009. Note : In press. T Mansi, B André, M Lynch, M Sermesant, H Delingette, Y Boudjemline, and N Ayache.
5. Tumor Growth Modeling in Oncological Image Analysis. In I. Bankman, editor, Handbook of Medical Image Processing and Analysis - New edition, chapter 18, pages 297-307. Academic Press, December 2008. Note : ISBN-13 : 978-0-12-373904-9. E Konukoglu, X Pennec, O Clatz, and N Ayache.
6. Landmark-based registration using features identified through differential geometry. In I. Bankman, editor, Handbook of Medical Image Processing and Analysis - New edition, chapter 34, pages 565-578. Academic Press, December 2008. Note : ISBN-13 : 978-0-12-373904-9. X Pennec, N Ayache, and J P Thirion.
7. Processing of In Vivo Fibered Confocal Microscopy Video Sequences. In Jens Rittscher, Raghu Machiraju, and Stephen T. C. Wong, editors, Microscopic Image Analysis for Life Science Applications, chapter 19, pages 441-463. Artech House, 2008. T Vercauteren, N Ayache, N Savoie, G Malandain, and A Perchant.
8. Non-Rigid MR/US Registration for Tracking Brain Deformations. In R.S. Blum and Zh. Liu, editors, Multi-Sensor Image Fusion and Its Applications, volume 26 of Signal Processing and Communications, chapter 4, pages 107-143. CRC Press - Taylor and Francis, July 2005. Xavier Pennec, Alexis Roche, Pascal Cathier, and Nicholas Ayache.
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Refereed International Conference Publications (selection)

1. Recognition of partially visible planar shapes. *6th Int. Conf. on Pattern Recognition*, Munich, Sept. 1982, (N. Ayache and O. Faugeras).
2. Toward a flexible vision system. *Robot Vision*, IFS Publications, Springer Verlag, 1983, (N. Ayache and O. Faugeras, F. Germain, G. Kryze, J-D. Boissonnat, M. H bert, J. Ponce, E. Pauchon), pp. 129-142.
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4. A new method for recognition and positioning of 2-d objects. *7th Int. Conf. on Pattern Recognition*, Montr al, pp. 1274-1277, July 1984, (N. Ayache and O. Faugeras).
5. Automatic handling of overlapping workpieces. *7th Int. Conf. on Pattern Recognition*, Montr al, Canada, pp. 837-839, July 1984, (N. Ayache and J.D. Boissonnat, B. Bollack, and B. Faverjon).

6. A geometric matcher for recognizing and positioning 3-d rigid objects. *1st IEEE Int. Conf. on the Applications of Artificial Intelligence*, Denver, Dec. 1984, (N. Ayache and O.D. Faugeras, B. Faverjon, and G. Toscani), Also in *Int. Conf. on Intelligent Robots and Computer Vision*, Proc. of the SPIE, Oct. 1984.
7. Fast stereo matching of edge segments using prediction and verification of hypotheses. *3rd Workshop on Computer Vision, Representation and Control*, Bellaire, Michigan (USA), pp. 27–37, Oct. 1985. Reduced paper in *Proc. of IEEE Conf. on Computer Vision and Pattern Recognition*, San Fransisco, June 1985 (N. Ayache and B. Faverjon).
8. Matching depth maps obtained by passive stereovision. *3rd Workshop on Computer Vision : Representation and Control*, Bellaire, Michigan (USA), pp. 197–204, October 1985, (N. Ayache and O. Faugeras et B. Faverjon).
9. Building visual maps by combining noisy stereo measurements. *Proc. of the IEEE International Conference on Robotics and Automation*, pp. 1433–1438, San Francisco, April 1986, (N. Ayache and O. Faugeras and B. Faverjon).
10. Maintaining representations of the environment of a mobile robot. (N. Ayache and O. Faugeras), dans *International Symposium on Robotics Research*, Santa Cruz (USA), August 1987, édité par MIT-Press.
11. Fast and reliable passive stereovision using three cameras. *IEEE Workshop on the Industrial Applications of Machine Vision and Machine Intelligence*, Tokyo, February 1987, (N. Ayache and F. Lustman).
12. Building, registrating and fusing noisy visual maps. *First International Conference on Computer Vision*, pp. 73–82, London, 1987, (N. Ayache and O. Faugeras).
13. Fast and reliable passive trinocular stereovision. *First International Conference on Computer Vision*, pp. 422–427, London, 1987 (N. Ayache and F. Lustman).
14. Trinocular stereovision, recent results. *Tenth International Joint Conference on Artificial Intelligence*, pp. 826–828, 1987, (N. Ayache and F. Lustman).
15. Building a consistent 3d representation of a mobile robot environment by combining multiple stereo views. *Tenth International Joint Conference on Artificial Intelligence*, pp. 808–810, Milano, 1987 (N. Ayache and O. Faugeras).
16. Visual navigation of a mobile robot. *IEEE International Workshop on Intelligent Robots and Systems (IROS'88)*, October 1988, Tokyo, Japan, (avec O.D. Faugeras, F. Lustman and Z. Zhang).
17. Visual navigation of a mobile robot : recent steps. *International Symposium and Exposition on Robots (ISER'88)*, November 1988, Sydney, Australia, (avec O.D. Faugeras, F. Lustman, and Z. Zhang).
18. Efficient depth estimation using trinocular stereovision. *SPIE Conference on Sensor Fusion : Spatial Reasoning and Scene Interpretation*, 1988, Cambridge, Massachusetts, (N. Ayache and C. Hansen and F. Lustman).
19. A preliminary investigation of the problem of determining ego- and object motions from stereo. *Proc. International Conference on Pattern Recognition*, 1988, 9th, Roma, Italy, (avec O.D. Faugeras, and Z. Zhang).
20. Rectification of images for binocular and trinocular stereovision. *Proc. International Conference on Pattern Recognition*, October 1988, 9th, Roma, Italy, (N. Ayache and C. Hansen).
21. Towards Real-Time Trinocular Stereovision *International Conference on Computer Vision*, 1988, Tampa, Florida (N. Ayache and C. Hansen and F. Lustman).
22. Analysis of a sequence of stereo scenes containing multiple moving objects using rigidity constraints. *International Conference on Computer Vision*, 1988, Tampa, Florida (avec Z. Zhang and O.D. Faugeras).
23. Depth and Motion Analysis : the machine being developed within Esprit project 940. *Proc. of IAPR Workshop on Computer Vision (Special Hardware and Industrial Applications)*, October 1988, Tokyo, Japan, pp. 35-44 (avec O. Faugeras, R. Deriche, F. Lustman, E. Giuliano).
24. Final Steps Towards Real-Time Trinocular Stereovision, *First European Conference on Computer Vision*, Antibes, 1990. Version complète dans rapport de recherche Inria No 1284, 29 pages, 1990 (N. Ayache and G. Randall, S. Foret).
25. Building highly structured volume representations in 3d medical images. In *Computer Aided Radiology*, 1989. Berlin, West-Germany (N. Ayache and J.D. Boissonnat, E. Brunet, L. Cohen, J.P. Chièze, B. Geiger, O. Monga, J.M. Rocchisani, and P. Sander)
26. Building 3D Edge Lines Tracked in an Image Sequence, in *Intelligent Autonomous Systems-2 Conference*, December 1989, Amsterdam, The Netherlands (N. Ayache and T. Skordas, P. Puget and R. Zigmann).
27. Three-dimensional Fusion from a Monocular Sequence of Images, *Nato Advanced research Workshop on Multisensor Fusion for computer Vision*, Grenoble, June 1989 (avec J.L. Jezouin).

28. Three-dimensional Reconstruction from a Monocular Sequence of Images, *Int. Conf. on Computer Vision, Osaka*, Decembre 1990 (avec J.L. Jezouin).
29. Modeling uncertainty for estimating local surface geometry BRA Workshop (Heracklion, Grèce), conférence invitée, 1990. (O. Monga, N. Ayache and P. Sander).
30. Analysis of time sequences of ultrasound images, In 1st European conference on biomedical engineering, Nice, 1991. (avec I. Herlin).
31. Topological segmentation of discrete surfaces, IEEE. Conf. on Computer Vision and Pattern Analysis, CVPR'91, Hawaii, USA, 1991 (avec G. Malandain and G. Bertrand).
32. Introducing deformable surfaces to segment 3D images and infer differential structures. IEEE. Conf. on Computer Vision and Pattern Analysis, CVPR'91, Hawaii, USA, 1991 (avec I. and L. Cohen).
33. Using Uncertainty to link edge detection and local surface modelling, *12th Int. Conf. on Information Processing in Medical Images*, Lecture Notes in Computer Science, Vol 511, Springer-Verlag, 1991.. (O. Monga, N. Ayache and P. Sander).
34. From voxel to curvature and surface features. IEEE. Conf. on Computer Vision and Pattern Analysis, CVPR'91, Hawaii, USA, 1991 (O. Monga, N. Ayache and P. Sander).
35. Using Surface Curvatures for 3D image Registration, in 11th Conf. on Computer Applications in Radiology, Baltimore, USA, 1992. (S. Benayoun, O. monga, A. Guéziec, N. Ayache).
36. Tracking Points on Deformable Objects Using Curvature Information. 2nd European Conference on Computer Vision (ECCV 92), pp 458-466, may 1992 (I. Cohen, N. Ayache and P. Sulger).
37. Using deformable surfaces to segment 3D images and infer differential structures. 2nd European Conference on Computer Vision (ECCV 92), pp 648-652, may 1992, (I. Cohen, L.D. Cohen and N. Ayache).
38. Smoothing and Matching of 3D Space Curves. 2nd European Conference on Computer Vision (ECCV 92), may 1992 (A. Guéziec and N. Ayache).
39. Features Extraction and Analysis Methods for Sequences of Ultrasound Images. 2nd European Conference on Computer Vision (ECCV 92), mai 1992 (I.L. Herlin and N. Ayache).
40. Large Deformable Splines, Crest Lines and Matching. SPIE'93, Geometric Methods in Computer Vision II, vol. 2031-38 pp 316-327, july 1993, (A. Guéziec and N. Ayache)
41. Fast Segmentation, Tracking, and Analysis of Deformable Objects. 4th International Conference on Computer Vision (ICCV 93), may 1993. (C. Nastar and N. Ayache)
42. Non-Rigid Motion Analysis in Medical Images : a Physically Based Approach. 13th International conference on Information Processing in Medical Imaging (IPMI'93), june 1993. (C. Nastar and N. Ayache)
43. A Physically Based Analysis of Deformations in 3D Images. SPIE'93, Geometric Methods in Computer Vision II, Vol 2031, pp. 182–192, July 1993. (C. Nastar and N. Ayache).
44. Classification of nonrigid motion in 3D images using Phusics-Based Vibration Analysis, in IEEE Workshop on Biomedical Image Analysis, WBIA'94, Seattle, USA, Juin 1994. (C. Nastar and N. Ayache).
45. Spatio-temporal analysis of nonrigid motion from 4D data, in in IEEE Workshop on non rigid and articulated objects, Austin, Texas, Nov. 1994. (C. Nastar and N. Ayache).
46. Time Representation of Defromations : Combining Vibration Modes and Fourier Analysis, Object Representation in Computer Vision, Internation NSF-ARPA Workshop, New-York, USA, Lecture Notes in Computer Science, No 994, Springer-Verlag, Dec. 1994. (C. Nastar and N. Ayache).
47. An $O(n^2)$ algorithm for 3D substructure matching of proteins, in 1st IEEE international workshop on shape and pattern matching in computational biology, Juin 1994. (X. Pennec and N. Ayache).
48. Rigid and affine registration of smooth surfaces using differential properties. 3rd European Conference on Computer Vision, vol 2, pp 397-406, may 1994 (J. Feldmar and N. Ayache).
49. Locally Affine Registration of Free-Form Surfaces. Conference on Computer Vision and Pattern Recognition (CVPR 94), june 1994. (J. Feldmar and N. Ayache).
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51. Non-Rigid Registration for Building 3D Anatomical Atlases. 12th International Conference on Pattern Recognition (ICPR 94), octobre 1994. (G. Subsol, J.P. Thirion and N. Ayache)
52. Steps Towards Automatic Building of Anatomical Atlases. International Conference on Visualization and Biomedical Computing (VBC 94), october 1994. (G. Subsol, J.P. Thirion and N. Ayache)

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