

Nicholas AYACHE

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Born in Paris 1st November 1958 French Nationality, married, 3 children
Work : INRIA, 2004 Route des Lucioles, 06902 Sophia-Antipolis, France
Tel : +33 (0)492 38 76 61 ; Nicholas.Ayache[at]Inria.fr
[http ://www-sop.inria.fr/asclepios/personnel/Nicholas.Ayache/](http://www-sop.inria.fr/asclepios/personnel/Nicholas.Ayache/)

Current Research Interests Biomedical Image Analysis and Simulation ; Computational Models of Living Systems including geometrical, statistical, physical and functional components ; Analysis and Simulation of Physiological Systems with computational models and biomedical images ; Design of innovative systems for Surgery Simulation and Image-Guided Therapy.

Education

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

Professional Academic Experience

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

Publications, Softwares, Patents

- **7 books** : author of **1** monograph (341 pages) published by MIT Press (English) and Masson (French), Editor of **4** proceedings of peer-reviewed international conferences published in LNCS by Springer, Editor of **1** book in Handbook of Numerical Analysis series.
- **27 book chapters** and invited articles, over **100 peer-reviewed Journal articles**.
- Over **200 Conference articles** in peer-reviewed competitive international archived conferences.
- **Citations 8115 ; h-index : 47** (Harzing's Publish or Perish (Feb 2008)) ; **80 publications in Pubmed**.
- **Softwares** : Author of several softwares in shape recognition, binocular and trinocular stereovision, general image and medical image analysis.
- **12 patents**.

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)
- 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 **48** PhD Students who graduated between 1992 and Feb. 2009, of **8** PhD Students currently preparing their PhD, **5** past Habilitations.

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

- 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)

- **Conference Chair** of **FIMH 2009** (Functional Imaging and Modeling of the Heart), Nice.
- **Program Chair** of **MICCAI 2007** (Medical Image Computing and Computer Ass. Interventions), 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 Simulation 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.).

Nominations to Scientific Councils (selection)

- 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 National Research Program (PNR) 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.

Prizes and Distinctions (selection)

- 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, "for pioneering research on combining anatomical, physical and functional models for organ modeling and simulation, and service to the MICCAI society".
- 2008 : Elected Member of the College of the **AIMBE** (American Institute for Medical and Biological Engineering.
- 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 awarded at ICPR conference (with J.P. Thirion, G. Malandain, J. Feldmar et J. Declerck).

Best Paper Awards (selection)

- 2008 : Best paper award at **MICCAI'2008** (with S. Durrleman, X. Pennec, P. Thompson and A. Trouvé).
- 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 PhD Students (selection)

- 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.
- 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.

Main Plenary Invited Lectures (Selection)

- **Académie des Sciences**, May 2009, Plenary Session on Scientific Challenges of 21st century.
- **Medical Imaging Conference**, February 2009, Orlando, USA, Keynote lecture.
- **College de France**, March 2008, invited by Professor Gerard Berry.
- **Mayo Clinic**, Rochester, USA, 2007
- **Brigham and Women's Hospital**, Monthly Seminars of Radiology, Boston, USA, 2007
- **French Academy of Sciences, special session in Nice, 2006.**
- **Triangle Computer Science Distinguished Lecturer Series**, Chapel Hill, 2006.
- **Haemodol Conference on Computational Physiological Fluids**, Bergamo Italy, 2006.
- **Shun Hing Intitute** , Distinguished Speaker, Hong-Kong, 2005.
- **First Robotics Science Conference**, keynote speaker, MIT, Boston, 2005.
- **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.
- **Maison Française of Oxford**, UK, 2004.
- **Mathematics in Brain Imaging**, UCLA, Los-Angeles, 2004.
- **Medical Imaging and Augmented Reality**, keynote speaker, Beijing, 2004.
- **Jacques Morgenstern Colloquium**, INRIA Sophia-Antipolis, 2004.
- **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.
- **Iliatech : 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).
- **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).
- **International Conference on Pattern Recognition**, keynote, (Australia, 1998).
- **Asian Conference on Computer Science** (Népal, keynote, 1997).
- **British Machine Vision Conference** (Birmingham, 1995).

Other invited lectures (selection)

- 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-Heights, 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. Bardin** 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** (Copenhagen 97), VR-Technologies, USA, NetDoktor (Scandinavia) 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), Res. Direct. 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** (expected January 2009).
48. **E. Konukoglu** (Expected Feb 2009).

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

1. **B. Andre** (2011)
2. **F. Billet** (2009)
3. **S. Durrleman** (2009)
4. **E. Geremia** (2011)
5. **J. Relan** (2011)
6. **T. Mansi** (2010)
7. **J-M. Peyrat** (2009)
8. **A. Prakosa** (2011)

Publications of Nicholas Ayache

A constantly updated list of over 350 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. *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. Springer.
2. *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. Springer.
3. *Computational Models of the Human Body*, N. Ayache, Volume Editor, Handbook of Numerical Analysis, (P. Ciarlet Series Editors), 670 pages, Elsevier, 2004.
4. *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
5. *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).
6. *Artificial Vision for Mobile robots — Stereo-vision and Multisensor Perception*, 342 pages, MIT-Press, 1991. (N. Ayache).
7. *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. 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, 2008. (N. Ayache, O. Clatz, H. Delingette, G. Malandain, X. Pennec, and M. Sermesant.)
2. 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*. Artech House, 2008. Note : Approximately 30 pages. In press. (T. Vercauteren, N. Ayache, N. Savoie, G. Malandain, and A. Perchant.)
3. 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.
4. *Non-Rigid MR/US Registration for Tracking Brain Deformations*. In R.S. Blum and Zh. Liu, editors, *Multi-Sensor Image Fusion and Its Applications*. Marcel Dekker Inc., 2005. (In Press). (X. Pennec, A. Roche, P. Cathier, and N. Ayache.)
5. *Soft Tissue Modeling for Surgery Simulation*. In *Computational Models for the Human Body, Handbook of Numerical Analysis (Series Editor : Ph. Ciarlet)*, pages 453-550. Elsevier, 2004. (H. Delingette and N. Ayache).
6. 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.

7. Towards Virtual Physiological Human : Multilevel Modeling and Simulation of the Human Anatomy and Physiology. White Paper on Research Challenges and Intermediate Steps to be addressed by Interdisciplinary Research Programs, Edited by DG Information Society and Media, ICT for Health, Nov 2005. (N. Ayache, A. Frangi, P. Hunter, R. Hose, I. Magnin, M. Viceconti et al.)
8. Medical Imaging Informatics : from Digital Anatomy to Virtual Scapels and Image Guided Therapy. Introduction to the *2002 IMIA Yearbook of Medical Informatics*, 2002. (N. Ayache).
9. Landmark-based registration using features identified through differential geometry, Chapter 31, In *Handbook of Medical Image Processing*. pages 499–513, Academic Press, 2000. (X. Pennec, N. Ayache, and J.P. Thirion).
10. Imagerie et robotique médicales : du microscope informatique au simulateur de chirurgie, *Technique et Sciences Informatiques*, Volume 19, Numéro 1, Janvier 2000. (N. Ayache). **Millenium Issue of TSI.**
11. L'analyse automatique des images médicales, état de l'art and perspectives. *Annales de l'Institut Pasteur*, Elsevier, 9 :1, pp,13–21, 1998 ; Also INRIA Resarch Report No.3364, 1998. (Nicholas Ayache).
12. Frequency-based nonrigid motion analysis : Application to 4 dimensional medical images, in *Deformable models in medical image analysis*, edited by A. Singh, D. Goldgof and D. Terzopoulos, IEEE Computer Society, Chapter 27, Pages 372-384, 1998. (C. Nastar and N. Ayache).
13. Medical Image Analysis and Simulation, *Lecture Notes in Computer Science*, Volume 1345, pp. 5-17, 1997. (N. Ayache)
14. Surgery Simulation with visual and haptic feedback, in *Robotics Research : 8th International Symposium*, Springer-Verlag, Editors Shirai, Hirose, 1997 (N. Ayache and S. Cotin and H. Delingette).
15. Building, registrating and fusing noisy visual maps. Chapter 21 of the book *Multisensor integration and fusion for intelligent machines and systems*, edited by Ren C. Luo and Michael G. Kay, Ablex Publishing Corporation, 1995. (N. Ayache and O. Faugeras).
16. Segmentation of Complex 3D medical Objects : a challenge and a requirement for computer assisted surgery planning and performing. In R. Taylor and S. Lavalée, editors, *Computer Integrated Surgery*, MIT-Press, 1995. (N. Ayache, Ph. Cinquin and al.)
17. Computer Vision applied to 3-D Medical Images : Results, Trends and Future Challenges, in Chapter 12 of *the 6th Int. Symposium on Robotics Research*, invited conference, The International Foundation for Robotics Research, Cambridge, USA and c/o LAAS, 7 Av. du Colonel Roche, 31077- Toulouse France, 1994. also INRIA Research Report, No. 2050, 53 pages. (N. Ayache).
18. Deformable 3D objects : using modes and FFT for a quantitative analysis of nonrigid motion, in IEEE Workshop on Object Representation for Computer Vision, Editors : M. Hébert, J. Ponce, T. Boulton and A. Gross. New-York, USA, 1994. (C. Nastar and N. Ayache).
19. An $\mathcal{O}(n^2)$ Algorithm for 3D Substructure Matching of Proteins, in *Shape and Pattern Matching in Computational Biology*, Plenum Publishing, 1994, editors : A. Califano, I. Rigoutsos, I. and H.J. Wolson, H.J., (X. Pennec, and N. Ayache).
20. A New Physically Based Model for Efficient Tracking and Analysis of Deformations, *Lecture notes in computer science : Geometric Reasoning - from Perception to Action*, Editor : C. Laugier. Springer-Verlag, 1993. (C. Nastar and N. Ayache).
21. Medical Image Tracking, Chapter 17 of book *Active Vision* edited by A. Blake and A. Yuille, MIT-Press, 1992, (N. Ayache, I. Cohen and I. Herlin).
22. Maintaining representations of the environment of a mobile robot. Chapter of the book *Intelligent Autonomous Mobile Robots*, Editors : S.S. Iyengar and A. Elfes, 1992. (N. Ayache and O. Faugeras).
23. Lissage et recalage de courbes gauches bruitées, *Traitement du signal*, 9 :6, (1992). (A. Guézic and N. Ayache).
24. Analysis of a sequence of stereo scenes containing multiple moving objects using rigidity constraints. in *Computer Vision Principles*, IEEE Computer Society Press, 1991, Editors : R. Kasturi and R.C. Jain (Z. Zhang and O.D. Faugeras and N. Ayache).
25. Steps towards the automatic interpretation of 3D images, in *3D imaging in medicine*, Springer Verlag, 1990, edited by K. Hohne, H. Fuchs and S. Pizer, NATO ASI Series, Vol. F60. (N. Ayache, J.D. Boissonnat and L. Cohen and B. Geiger and J. Levy-Vehel and O. Monga and P. Sander).
26. Model guided recognition and positioning of 2D and 3D objects, *Industrial Applications of Image Analysis, D.E.B. Publishers*, The Netherlands, 1983, (O. Faugeras, N. Ayache and M. Hébert).

Patents for each patent, only the original reference is given here, even when an international extension was later granted.

1. Procédé and dispositif d'aide à l'inspection d'un corps, notamment pour la tomographie, Brevet Français, numero 91 05138, Avril 1991. (JP. Thirion and N. Ayache).
2. Dispositif de traitement d'informations d'images tri-dimensionnelles avec extraction de lignes remarquables, Brevet Français, numero 92 03900, Mars 1992. Extension EUROPE le 01-12-99. (J.P. Thirion, N. Ayache, O. Monga, and A. Gourdon).
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2. Identification and localisation de formes planes : système commercialisés and perspectives d'évolution. *4ème Congrès de Reconnaissance des Formes et Intelligence Artificielle*, Journées de synthès, 16 pages, Jan. 1984.
3. Manipulation automatique de pièces industrielles en vrac planaire. *1er Colloque Image*, Biarritz, pp. 869–876, Mai 1984, (avec J.D. Boissonnat, B. Bollack, and B. Faverjon).
4. Un algorithme rapide de stéréovision passive utilisant la prédiction and la vérification récursive d'hypothèses. *5ème Congrès de Reconnaissance des Formes et Intelligence Artificielle*, Grenoble, pp. 1217–1232, Nov. 1985, (avec B. Faverjon).
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6. Stéréovision trinoculaire. *6ème Congrès de Reconnaissance des Formes and Intelligence Artificielle*, Antibes, 1987, (avec F. Lustman).
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