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Research Scientist in Medical Image Processing

EDUCATION

- 2003-07** PhD in Computer Science. Subject: “*Design and Use of Anatomical Atlases for Radiotherapy*”.
Advisor: Grégoire Malandain.
- 2002-03** Master of Science in applied mathematics, Ecole Normale Supérieure (ENS Cachan).
- 1998-2003** Graduated from Engineering School Compiègne University of Technology in Computer Science.

WORK EXPERIENCE

- 2009-** Research scientist at INRIA Rennes – Bretagne Atlantique, VISAGES Team.
- Patient adapted atlases, robust group comparison
 - Study of neurodegenerative diseases, and brain development
- 2007-** Research Associate at Harvard Medical School. Instructor in Radiology since October 2008.
Computational Radiology Laboratory, Boston.
- Statistical atlas creation for the comparison of populations
 - Characterization of diseases in DTI (multiple sclerosis, epilepsy, ...)
- 2003-07** PhD at INRIA Sophia Antipolis, in Asclepios team and with DOSIsoft S.A.
- Incorporation of deformability statistics in registration.
 - Locally affine framework for non rigid registration of anatomical structures
 - Atlas-based segmentation of critical structures of the brain and the head and neck regions
- 2003** Master degree training period, INRIA Sophia Antipolis, Epidaure team. Advisor: Grégoire Malandain. Elastic registration of a brain atlas in the presence of pathological structures.
- Automatic segmentation of pathological regions and introduction in the registration.
- 2002** Graduate degree internship, IGN (MATIS research team), Saint Mandé, France. Extraction of road axes for automatic positioning of cadastral images on aerial images.

SKILLS

Computer Science C, C++, Java, Matlab, Maple, ITK, VTK. Linux, MacOS and Windows systems.
Foreign Languages French (mother tongue). English: fluent (2 years in the United States).

TEACHING

- 2006** Graduate student instructor, Nice Sophia Antipolis University, Nice (France).
Taught biomedical image processing to master level students

OTHER ACTIVITIES

Reviewer Medical Image Analysis, IEEE Transactions on Medical Imaging, Medical Physics, Human Brain Mapping, Neuroimage, MICCAI, ISBI.

PUBLICATIONS

- **PhD Thesis**

Olivier Commowick. Création et Utilisation d'Atlas Anatomiques Numériques pour la Radiothérapie (Design and Use of Anatomical Atlases for Radiotherapy). Thèse de sciences (PhD Thesis), Université de Nice -- Sophia-Antipolis, February 2007.

- **Journals**

O. Commowick and S.K. Warfield. Estimation of Expert Performance Parameters Bounds from STAPLE. *IEEE Transactions on Medical Imaging*, 2010. In Press.

M. L. Krishnan, **O. Commowick**, S. S. Jeste, N. Weisenfeld, A. Hans, M. C. Gregas, M. Sahin and S. K. Warfield. **Diffusion Features of White Matter in Tuberos Sclerosis With Tractography.** *Pediatric Neurology*, 42(2):101-106, 2010.

R. Sims, A. Isambert, V. Gregoire, F. Bidault, L. Fresco, J. Sage, J. Mills, J. Bourhis, D. Lefkopoulos, **O. Commowick**, M. Benkebil, and G. Malandain. **A Pre-Clinical Assessment of an Atlas-Based Automatic Segmentation Tool for the Head and Neck.** *Radiotherapy Oncology*, 93(3):474-478, 2009.

S. C. Schacter, J. Guttag, S. J. Schiff, D. L. Schomer, Summit Contributors. **Advances in the Application of Technology to Epilepsy: The CIMIT/NIO Epilepsy Innovation Summit.** *Epilepsy and Behavior*, 16(1):3-46, 2009.

O. Commowick and S.K. Warfield. A Continuous STAPLE for Scalar, Vector and Tensor Images: An Application to DTI Analysis. *IEEE Transactions on Medical Imaging*, 28(6):838-846, 2009.

V. Arsigny, **O. Commowick**, X. Pennec and N. Ayache. **A fast and log-euclidean polyaffine framework for locally linear registration.** *Journal of Mathematical Imaging and Vision*, 33(2):222-238, 2009.

O. Commowick, V. Arsigny, A. Isambert, J. Costa, F. Dhermain, F. Bidault, P.-Y. Bondiau, N. Ayache, and G. Malandain. **An Efficient Locally Affine Framework for the Smooth Registration of Anatomical Structures.** *Medical Image Analysis*, 12(4):427-441, August 2008.

O. Commowick, V. Grégoire and G. Malandain. **Atlas-based delineation of lymph node levels in head and neck computed tomography images.** *Radiotherapy Oncology*, 87(2):281-289, 2008.

A. Isambert, F. Dhermain, F. Bidault, **O. Commowick**, P.-Y. Bondiau, G. Malandain, and D. Lefkopoulos. **Evaluation of an atlas-based automatic segmentation software for the delineation of brain organs at risk in a radiotherapy clinical context.** *Radiotherapy Oncology*, 87(1):93-99, 2008.

P.-Y. Bondiau, G. Malandain, S. Chanalet, P.-Y. Marcy, J.-L. Habrand, F. Fauchon, P. Paquis, A. Courdi, **O. Commowick**, I. Rutten, and N. Ayache. **Atlas-based automatic segmentation of MR images: validation study on the brainstem in radiotherapy context.** *Int J Radiat Oncol Biol Phys*, 61(1):289-98, January 2005.

- **Selected peer reviewed full length conference papers**

O. Commowick, N. I. Weisenfeld, H. Als, G. B. McAnulty, S. Butler, L. Lightbody, R. M. Robertson and S. K. Warfield. **Evaluation of White Matter in Preterm Infants With Fetal Growth Restriction.** In Proceedings of the Workshop on Image Analysis for the Developing Brain, held in conjunction with MICCAI'09, 2009.

O. Commowick, S. K. Warfield and G. Malandain. **Using Frankenstein's Creature Paradigm to Build a Patient Specific Atlas.** In Proceedings of MICCAI'09, Part II, vol 5762 of LNCS, pages 993-1000, 2009.

O. Commowick and Simon K. Warfield. **Estimation of Inferential Uncertainty in Assessing Expert Segmentation Performance from STAPLE.** In Proc. of Information Processing in Medical Imaging, pages 701-712, 2009.

O. Commowick, P. Fillard, O. Clatz and S.K. Warfield. **Detection of DTI White Matter Abnormalities in Multiple Sclerosis Patients.** In Proc. Medical Image Computing and Computer Assisted Intervention (MICCAI'08), Part I, vol 5241 of LNCS, pages 975-982, September 2008.

O. Commowick and G. Malandain. **Efficient Selection of the Most Similar Image in a Database for Critical Structures Segmentation.** In Proc. Medical Image Computing and Computer Assisted Intervention (MICCAI'07), Part II, LNCS, Brisbane, Australia, pages 203-210, October 2007.

O. Commowick and G. Malandain. **Evaluation of Atlas Construction Strategies in the Context of Radiotherapy Planning.** In *Proceedings of the SA2PM Workshop (From Statistical Atlases to Personalized Models)*, Copenhagen, October 2006. Note: Held in conjunction with MICCAI 2006.

O. Commowick, V. Arsigny, J. Costa, N. Ayache, and G. Malandain. **An Efficient Locally Affine Framework for the Registration of Anatomical Structures.** In *Proceedings of ISBI 2006*, Crystal Gateway Marriott, Arlington, Virginia, USA, April 2006.

V. Arsigny, **O. Commowick**, X. Pennec, and N. Ayache. **A Log-Euclidean Framework for Statistics on Diffeomorphisms.** In *Proceedings of the 9th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI'06)*, LNCS, 2-4 October 2006. Springer.

V. Arsigny, **O. Commowick**, X. Pennec, and N. Ayache. **A Log-Euclidean Polyaffine Framework for Locally Rigid or Affine Registration.** In *Proceedings of WBIR'06*, LNCS, Utrecht, The Netherlands, 9 - 11 July 2006. Springer.

O. Commowick, R. Stefanescu, P. Fillard, V. Arsigny, N. Ayache, X. Pennec, and G. Malandain. **Incorporating Statistical Measures of Anatomical Variability in Atlas-to-Subject Registration for Conformal Brain Radiotherapy.** In *Proceedings of MICCAI'05*, volume 3750 of LNCS, pages 927-934, October 2005.

R. Stefanescu, **O. Commowick**, G. Malandain, P.-Y. Bondiau, N. Ayache, and X. Pennec. **Non-Rigid Atlas to Subject Registration with Pathologies for Conformal Brain Radiotherapy.** In *Proceedings of MICCAI'04*, volume 3216 of LNCS, pages 704-711, September 2004. Springer Verlag.