

# COLAS SCHRETTER

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- CONTACT** RWTH Aachen University <http://homepages.ulb.ac.be/~cschrett/schretter@informatik.rwth-aachen.de>  
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52056 Aachen, Germany +39-366-1949-675 (mobile phone)
- INTERESTS** I'm interested in theoretical aspects of computer science, geometric algorithms and dynamic data structures, physically-based modeling and Monte-Carlo simulations, density estimation problems and expectation-maximization methods. I'm currently applying those approaches for statistical image reconstruction in positron emission tomography and for real-time computer rendering.
- EDUCATION** **Doctor of Engineering (Ph.D.)** with *magna cum laude* *April 2010*  
*Institution:* Otto-von-Guericke University, Magdeburg, Germany  
*Thesis:* Correction of Non-Periodic Motion in Computed Tomography  
*Advisors:* Georg Rose and Matthias Bertram
- Master of Advanced Studies in Sciences (DEA)** *grade N.A.* *September 2006*  
*Institution:* Université libre de Bruxelles, Brussels, Belgium  
*Thesis:* New Algorithms for Image Reconstruction From Emission Tomography List-Mode Data  
*Advisors:* Serge Goldman and Michel Defrise
- Master of Computer Science (M.Sc.)** with *great honors* *September 2004*  
*Institution:* Université libre de Bruxelles, Brussels, Belgium  
*Thesis:* Efficient N-Body Algorithms for Astrophysical Simulations  
*Advisors:* Jean Cardinal and Yves Busegnies
- EXPERIENCE** **RWTH Aachen University** *Since May 2010*  
I'm currently working on sparse continuous representations of digital images with B-spline mixture models. Results are applied to medical image denoising and positron emission tomography.
- Philips Research Europe** *February 2007 – April 2010*  
I moved to Germany for working within the labs of Philips Research. I proposed new methods for estimation and compensation of unexpected patient motion in X-ray computed tomography.
- Université libre de Bruxelles** *November 2003 – February 2005*  
I joined the unit of evolutionary genetics from the Institute of Molecular Biology and Medicine (IBMM) with a research contract for developing novel heuristic algorithms in bioinformatics.
- Oniros Illusion Studios** *January – August 2001*  
I worked part-time as a game developer with the Virtools C++ platform. My project was creating a believable simulation of traffic flow based on behavioral modeling and graph walk algorithms.
- TEACHING** I supervised the thesis of several Master students at the RWTH Aachen University, often fostering tight collaborations with industrial partners. I was also in charge of the seminars *Current Topics in Computer Graphics, Geometry Processing, and Computer Vision*.
- In 2005 and 2006, I created exercise materials, gave lectures and graded exams and projects for various programming courses at the Université libre de Bruxelles: *Introduction à la Programmation* (INFO-H-100), *Algorithmes et Structures de Données* (COMM-B-422), *Introduction à la Programmation en Java* (COMM-B-423) and *Informatique pour la Gestion* (INFO-D-101).
- GRANTS** I obtained two Marie Curie fellowships of the European Marie Curie EST and ERG programmes (MEST-CT-2005-020424 and PERG06-GA-2009-256519). I was supported by the Walloon region of Belgium (Initiative Nr. 114840) and the PET/Cyclotron Biomedical at Erasme Hospital, Brussels.
- REVIEWING** I'm regularly appointed as a peer-reviewer for prestigious international journals such as *Bioinformatics*, *IEEE Transactions on Image Processing* and *IEEE Transactions on Medical Imaging*.
- ACTIVITIES** **Software Development**  
I created *OligoFaktory Standalone Edition* for Mac OS X, a bioinformatics software for designing long oligonucleotides for microarrays, primer pairs for PCR amplifications, siRNAs and more...
- Demomaking**  
I designed and programmed various real-time computer graphics animations in collaboration with graphic artists and musicians. More details on the website <http://colas.planet-d.net>

## JOURNAL PAPERS

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- SCHRETTNER, C., DEHAYE, P.-O. AND KOBBELT, L., "Golden Ratio Sequences for Low-Discrepancy Sampling," *Journal of Graphics Tools*, submitted, 2011.
- SCHRETTNER, C., ROSE, G. AND BERTRAM, M., "Image-Based Iterative Compensation of Motion Artifacts in Computed Tomography," *Medical Physics*, vol. 36, no. 11, pp. 5323–5330, 2009.
- SCHRETTNER, C., "Event-by-Event Image Reconstruction From List-Mode PET Data," *IEEE Transactions on Image Processing*, vol. 8, no. 1, pp. 117–124, 2009.
- MEYER, P. E., SCHRETTNER, C. AND BONTEMPI, G., "Information-Theoretic Feature Selection in Microarray Data Using Variable Complementarity," *IEEE Journal of Selected Topics in Signal Processing*, vol. 2, no. 3, pp. 261–274, 2008.
- SCHRETTNER, C., "A Fast Tube of Response Ray-Tracer," *Medical Physics*, vol. 33, no. 12, pp. 4744–4748, 2006.
- SCHRETTNER, C. AND MILINKOVITCH, M. C., "OligoFaktory: A Visual Tool for Interactive Oligonucleotide Design," *Bioinformatics*, vol. 22, no. 1, pp. 115–116, 2006.
- SCHRETTNER, C., "A Brush Tool for Interactive Texture Synthesis," *ICGST International Journal on Graphics, Vision and Image Processing*, vol. 6, no. 5, pp. 55–60, 2005.

## CONFERENCE LECTURES

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- SCHRETTNER, C., SUN, J. AND KOBBELT, L., "Online Estimation of B-Spline Mixture Models From TOF-PET List-Mode Data," *Proc. of the 11<sup>th</sup> International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine*, Potsdam, Germany, July 11–15, pp. 271–274, 2011.
- SCHRETTNER, C., PILATUS, F., ROSE, G., AACH, T. AND BERTRAM, M., "Optical Flow Motion Estimation for Approximate Motion Compensation in Cone-Beam CT," *Proc. of the 10<sup>th</sup> International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine*, Beijing, China, September 5–10, pp. 327–330, 2009.
- SCHRETTNER, C., NEUKIRCHEN, C., ROSE, G. AND BERTRAM, M., "Optimal Pre-Filtering for Linear Interpolation in Computed Tomography," *Proc. of the 2<sup>nd</sup> Workshop on High-Performance Image Reconstruction*, Beijing, China, September 6, pp. 29–32, 2009.
- SCHRETTNER, C., NEUKIRCHEN, C., ROSE, G. AND BERTRAM, M., "Image-Based Iterative Compensation of Motion Artifacts in Computed Tomography," *SPIE Medical Imaging*, Lake Buena Vista, USA, 7–12 February, vol. 7258, pp. 1W–8, 2009.
- SCHRETTNER, C., NEUKIRCHEN, C., BERTRAM, M. AND ROSE, G., "Correction of Some Time-Dependent Deformations in Parallel-Beam Computed Tomography," *Proc. of the 5<sup>th</sup> IEEE International Symposium on Biomedical Imaging*, Paris, France, May 14–17, pp. 764–767, 2008.

## POSTER PRESENTATIONS

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- CHUN, S. Y., SCHRETTNER, C. AND FESSLER, J. A., "Sufficient Condition for Local Invertibility of Spatio-Temporal 4D B-Spline Deformations," *Proc. of the 7<sup>th</sup> IEEE International Symposium on Biomedical Imaging*, Rotterdam, The Netherlands, April 14–17, pp. 1221–1224, 2010.
- SCHRETTNER, C., "Online PET Reconstruction From List-Mode Data," *Proc. of the 10<sup>th</sup> International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine*, Beijing, China, September 5–10, pp. 195–198, 2009.
- SCHRETTNER, C., NEUKIRCHEN, C., ROSE, G. AND BERTRAM, M., "Local Correction of Non-Periodic Motion in Computed Tomography," *SPIE Medical Imaging*, Lake Buena Vista, USA, February 7–12, vol. 7258, pp. 2M–12, 2009.
- ISOLA, A. A., SCHRETTNER, C., GRASS, M., BERTRAM, M., ROSE, G. AND NIESSEN, W. J., "Compensation of Periodic Cardiac Motion and Non-Periodic Abdominal Motion in Cone-Beam CT," *Marie Curie Monitoring Mission*, Alexander von Humboldt Foundation, Bonn, Germany, January 29–30, 2009.

- SCHRETTNER, C., "Improving Image Quality in Computed Tomography by Motion Estimation and Compensation," *8<sup>th</sup> IEEE EMBS International Summer School on Biomedical Imaging*, Berder, France, June 20–28, 2008.
- BRINKS, R., SCHRETTNER, C. AND MEYER, C., "Comparison of Maximum-Likelihood List-Mode Reconstruction Algorithms in PET," *Proc. of the IEEE Nuclear Science Symposium and Medical Imaging Conference*, San Diego, USA, Oct. 29–Nov. 4, vol. M11-389, pp. 2801–2803, 2006.
- SCHRETTNER, C., GATTO, L. AND MILINKOVITCH, M. C., "OligoFaktory: A Web Portal for Interactive Oligonucleotide Design," *First BENELUX Bioinformatics Conference*, Ghent, Belgium, April 14–15, 2005.

## TECHNICAL NOTES

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- GATTO, L. AND SCHRETTNER, C., "Designing Primer Pairs and Oligos with OligoFaktorySE," *EMBnet news*, vol. 15, no. 3, pp. 22–24, 2009.
- SCHRETTNER, C., "Computing Random Points on Sphere," *Boost C++ Ticket 1059*, June, 2007.
- SCHRETTNER, C., "Discover OligoFaktory Standalone Edition," *EMBnet news*, vol. 11, no. 4, pp. 24–25, 2005.
- SCHRETTNER, C. AND GATTO, L., "A Tiny Queuing System for Blast Servers," December 2005.
- SCHRETTNER, C. AND MILINKOVITCH, M. C., "Automated Long Oligo Design on Consensus Regions of Similar Genomes," *Technical Report UEG, IBMM*, Université libre de Bruxelles, Brussels, Belgium, January 2005.
- SCHRETTNER, C. AND MILINKOVITCH, M. C., "Oligonucleotide Design by Multilevel Optimization," *Technical Report UEG, IBMM*, Université libre de Bruxelles, Brussels, Belgium, January 2005.

## DISSERTATIONS

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- SCHRETTNER, C., "Correction of Non-Periodic Motion in Computed Tomography," *Doctoral thesis*, Otto-von-Guericke University, Magdeburg, Germany, April 2010.
- SCHRETTNER, C., "New Algorithms for Image Reconstruction From Emission Tomography List-Mode Data," *DEA thesis*, Université libre de Bruxelles, Brussels, Belgium, September 2006.
- SCHRETTNER, C., "Efficient N-Body Algorithms for Astrophysical Simulations," *Master thesis*, Université libre de Bruxelles, Brussels, Belgium, June 2003.

## PATENTS

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- SCHRETTNER, C., BERTRAM, M. AND NEUKIRCHEN, C., "Method and Apparatus For Large Field of View Imaging and Detection and Compensation of Motion Artifacts," US 30961/04024, January, 2009.
- FORTHMANN, P., KÖHLER, T., VAN STEVENDAAL, U., BERTRAM, M., HOHMANN, S. AND SCHRETTNER, C., "Method and Apparatus to Improve CT Image Acquisition Using Displaced Geometry," US 30961/04021, September, 2008.