CV – Christof Seiler

Department of Advanced Computing Sciences, Maastricht University, NL, and
Department of Rheumatology, University Hospital Zurich, University of Zurich, CH
https://christofseiler.github.io/

Education

01/2013–12/2017	Stanford University, CA, US Advisor: Susan Holmes Postdoctoral Fellow in Statistics
07/2008–09/2012	Inria, FR & University of Bern, CH Advisors: Xavier Pennec & Mauricio Reyes PhD in Computer Science & Biomedical Engineering
02/2006–07/2008	University of Bern, CH MSc in Biomedical Engineering
09/2001–01/2006	University of Applied Sciences, Biel, CH Dipl. Ing. FH (equivalent to BSc) in Computer Science

Employment and Visiting Appointments

09/2023–present	Principal Investigator, Center of Experimental Rheumatology, Department of Rheumatology, University Hospital Zurich, University of Zurich, CH
10/2018–present	Assistant Professor of Statistics (with tenure since 01/2022), Department of Advanced Computing Sciences, Mathematics Centre Maastricht, Maastricht University, NL
11/2022–01/2023	Academic Guest, Hosted by Bjoern Menze, Department of Quantitative Biomedicine, University of Zurich, CH
01/2018–07/2018 01/2013–12/2017	Research Scientist in Statistics, Postdoctoral Researcher in Statistics, Department of Statistics, Stanford University, CA, US
03/2017–05/2017	EPFL-Stanford Exchange Fellow, Hosted by Dimitri Van De Ville, EPFL, Lausanne, CH
10/2010–09/2012	Doctoral Researcher, Asclepios Research Group, Inria Sophia Antipolis, FR
07/2008–09/2012	Doctoral Researcher, Institute for Surgical Technology and Biomechanics, University of Bern, CH
09/2010–12/2010	Visiting Graduate Fellow, Statistical and Applied Mathematical Sciences Institute, Durham, NC, US
12/2006–05/2008	Software Engineer, Integrated Scientific Services AG, Biel, CH
02/2006–12/2006	Software Engineer, Institute for Evaluative Research in Medicine, University of Bern, CH
02/2005–04/2005	Software Engineering Consultant (remote), Oridus Inc., Fremont, CA, US
09/2003–08/2004	Software Engineering Intern, Oridus Inc., Fremont, CA, US

Grants

04/2025–03/2028	The LOOP Zurich, Incubator Projects, CH Role: Responsible for bioinformatics work package / Amount: $61,000 Project: Early detection and prevention of systemic sclerosis
01/2025–06/2025	Olga Mayenfisch Stiftung, Zurich, CH Role: Co-PI / Amount: $50,000 Project: Multiomics analysis of chronic low back pain
09/2024–08/2026	DSI Infrastructure and Lab Program, University of Zurich, CH Role: Main PI / Amount: $110,000 Project: RAI Platform – Reliable AI for Biomedicine
01/2023–12/2027	ERC Starting Grant, NL Role: Senior statistician / Amount: $60,000 Project: Treatment of irritable bowel syndrome by neuromodulation
01/2023–01/2025	MLDS – Dutch Foundation for Gastrointestinal Disorders, NL Role: Senior statistician / Amount: $16,000 Project: Data-driven treatment of irritable bowel patients
09/2013–08/2014	France-Stanford collaborative project grant, FR Role: Coordinator / Amount: $14,850 Project: Statistical analysis of CT images of lower back pain

Fellowships

03/2017–05/2017	EPFL-Stanford exchange program fellowship, CH Role: Applicant / Amount: $11,000 Project: Reproducibility and transparency in neuroimaging
01/2015–12/2015	Swiss NSF Fellowship for Advanced Researchers, CH Role: Applicant / Amount: $49,400 Project: Monte Carlo methods in computational anatomy
01/2013–12/2014	Swiss NSF Fellowship for Prospective Researchers, CH Role: Applicant / Amount: $89,000 Project: Uncertainty in computational anatomy
08/2010–09/2012	Swiss SERI scholarship for joint PhD in FR and CH Role: Applicant / Amount: $10,000 Project: PhD thesis on modeling of organ deformations in medical images

Awards

2016	ISBA new researchers travel award, Sardinia, IT (gratefully declined)
2015	Conference on Bayesian Nonparametrics travel award, Raleigh, NC, US
2011	MICCAI Young Scientist Award, Toronto, CA (top 5 of about 819 submitted papers by PhD students and postdocs)
2011	MICCAI student travel award, Toronto, CA

Supervision and Mentoring

	University of Zurich
09/2023–	MSc theses (2 students)
	Maastricht University
09/2019–	MSc theses (27 students)
09/2019–	MSc internships (32 students)
09/2018–	BSc theses (14 students)
09/2018–	BSc internships (7 students)
	Stanford University
09/2016–08/2018	Diana Proctor, Postdoctoral Fellow
09/2016–08/2018	BSc thesis (1 student)
	University of Bern
09/2009–02/2010	BSc thesis (1 student)

Open Source Software Contributions

	`R` packages:
2023	`spillR`: Spillover compensation in mass cytometry data
2019	`CytoGLMM`: Conditional differential analysis for cytometry experiments
2019	`cytoeffect`: Multivariate regression for cytometry experiments
2017	`CovRegFC`: Multivariate heteroscedasticity models for fMRI
2017	`braincog`: Differential correlation analysis between MRI and cognitive tests
2017	`curvature`: Convergence diagnosis of Hamiltonian Monte Carlo
	`C++`, `C`, and `C` for Graphics (`Cg`) tools:
2015	Bayesian medical image registration (git repository)
2014	Bayesian nonparametric clustering for medical images (git repository)
2012	Tree structured medical image registration (git repository)
2009	Markov random fields on the GPU (git repository)
	`MATLAB` workflow:
2012	Cell shape classifier for time-lapse microscopy (git repository)

Teaching

	Courses at Maastricht University
09/2019–	KEN4258 Computational Statistics (MSc): Designer & lecturer
09/2019–	KEN2130 Probability and Statistics (BSc): Designer & lecturer
09/2018–08/2022	KEN1520 Software Engineering (BSc): Co-designer & co-lecturer
09/2018	MAT2006 Calculus (BSc): Lecturer
09/2018	Data Science School (BSc/MSc/PhD/Postdoc): Co-designer & co-lecturer
	Courses at Stanford University
09/2016–08/2018	STATS 366/BIOS 221 Modern Statistics for Modern Biology (PhD/Postdoc): Teaching assistant & guest lecturer
09/2015	STATS 205 Introduction to Nonparametric Statistics (MSc): Designer & lecturer (course website)
	Courses at ETH Zurich and University of Bern
09/2008–08/2010	Medical Image Analysis (MSc): Guest lecturer

Invited and Contributed Talks

11/2024	Panel Discussion, ISCCM10, Maastricht, NL
11/2024	BME & GCI Mini-Symposium, The University of Melbourne, VIC, AU
10/2024	ReproducibiliTea, University of Basel, CH
10/2024	Statistics Seminar, McMaster University, Hamilton, ON, CA
09/2024	Swiss Statistics Meeting, Aarau, CH
07/2024	ASML, Veldhoven, NL
04/2024	Wagi Lunch Seminar, University of Zurich, Schlieren, CH
06/2023	Workshop on Bayesian Inversion, Macolin, CH
02/2023	Institute of Neuropathology, University Hospital Zurich, CH
02/2023	Department of Quantitative Biomedicine, University of Zurich, CH
09/2020	Department of Methodology and Statistics, Maastricht University, NL
10/2019	Second Dutch Stan Meetup 2019, Utrecht, NL
09/2019	Basel Life, Basel, CH
12/2018	Data Science Research Seminar, Maastricht University, NL
03/2018	Department of Statistics, LMU, Munich, DE
02/2018	School of Mathematical Sciences, Queen Mary University of London, UK
05/2017	Workshop on Statistical Challenges in Single-Cell Biology, Ascona, CH
04/2017	Division of Immunology and Allergy, CHUV, Lausanne, CH
04/2017	CyTOF Working Group, Stanford University, CA, US
03/2017	MIP:Lab, EPFL, Campus Biotech, Geneva, CH
03/2017	Bioinformatics Core Facility, SIB, Lausanne, CH
6/2015	Conference on Bayesian Nonparametrics, Raleigh, NC, US
3/2015	Center for Imaging Science, Johns Hopkins, Baltimore, MD, US
10/2014	Workshop in Biostatistics, Stanford School of Medicine, CA, US
8/2014	JSM (Joint Statistical Meetings), Boston, MA, US
5/2014	Inria Sophia Antipolis, Sophia Antipolis, FR
3/2014	Institut de Mathématiques de Toulouse, Université Paul Sabatier, FR
10/2013	Departement of Statistics, Stanford University, CA, US
8/2013	Geometric Science of Information, Paris, FR
3/2013	Computational People United at Stanford, CA, US
3/2013	Artorg Center, University of Bern, CH
9/2011	MICCAI, Toronto, ON, CA
2/2011	SPIE Medical Imaging, Orlando, FL, US
6/2010	TERMIS, Galway, IE
6/2009	CAOS, Boston, MA, US
12/2008	3D Physiological Human, Zermatt, CH

Reviewer for Journals, Conferences, and Grants

2024	NWO Rubicon Postdoctoral Fellowships, Biostatistics
2013–2023	IPMI (Information Processing in Medical Imaging), Medical Image Analysis
2014–2022	Annals of Applied Statistics
2020–2022	Briefings in Bioinformatics
2022	MIDL (Medical Imaging with Deep Learning)
2021	MELBA (Machine Learning for Biomedical Imaging), Electronic Journal of Statistics, IEEE Journal of Biomedical and Health Informatics
2019	Journal of Machine Learning Research, Journal of Computational and Graphical Statistics, Neurocomputing
2012–2017	MICCAI (Medical Image Computing and Computer Assisted Intervention)

List of Publications

Same list with links to articles: https://christofseiler.github.io/research/

Peer-Reviewed Journal Articles

1. `spillR`: Spillover Compensation in Mass Cytometry Data
   M. Guazzini, A. Reisach, S. Weichwald, and **C. Seiler**
   Bioinformatics, Volume 40, Issue 6, btae337, June 2024

2. Multipotent Adult Progenitor Cells Prevent Functional Impairment and Improve Development in Inflammation Driven Detriment of Preterm Ovine Lungs
   S. Neuen, D. Ophelders, H. Widowski, M. Hütten, T. Brokken, C. van Gorp, P. Nikkels, C. Severens-Rijvers, M. Sthijns, C. van Blitterswijk, F. Troost, V. LaPointe, S. Jolani, **C. Seiler**, J. Pillow, T. Delhaas, N. Reynaert, and T. Wolfs
   Regenerative Therapy, Volume 27, Pages 207–217, December 2024

3. `CytoGLMM`: Conditional Differential Analysis for Flow and Mass Cytometry Experiments
   C. Seiler, A.-M. Ferreira, L. Kronstad, L. Simpson, M. Le Gars, E. Vendrame, C. Blish, and S. Holmes
   BMC Bioinformatics, Volume 22, Article 137, Pages 1–14, March 2021

4. Natural Killer Cell Phenotype is Altered in HIV-Exposed Seronegative Women
   N. Zhao, E. Vendrame, A.-M. Ferreira, **C. Seiler**, T. Ranganath, M. Alary, A.-C. Labbé, F. Guédou, J. Poudrier, S. Holmes, M. Roger, and C. Blish
   PLOS ONE, Volume 15, Issue 9, Pages 1–17, September 2020

5. Characterization of the Impact of Daclizumab Beta on Circulating Natural Killer Cells by Mass Cytometry
   T. Ranganath, L. Simpson, A.-M. Ferreira, **C. Seiler**, E. Vendrame, N. Zhao, J. Fontenot, S. Holmes, and C. Blish
   Frontiers in Immunology, Volume 11, Article 714, Pages 1–13, April 2020

6. Influenza-Induced Interferon Lambda Response Is Associated with Longer Time to Delivery Among Pregnant Kenyan Women
   C. Seiler, N. Bayless, R. Vergara, J. Pintye, J. Kinuthia, L. Osborn, D. Matemo, B. Richardson, G. John-Stewart, S. Holmes, and C. Blish
   Frontiers in Immunology, Volume 11, Article 452, Pages 1–10, March 2020

7. TIGIT is Upregulated by HIV-1 Infection and Marks a Highly Functional Adaptive and Mature Subset of Natural Killer Cells
   E. Vendrame, **C. Seiler**, T. Ranganath, N. Zhao, R. Vergara, M. Alary, AC. Labbé, F. Guédou, J. Poudrier, S. Holmes, M. Roger, and C. Blish
   AIDS, Volume 34, Issue 6, Pages 801–813, May 2020

8. Pregnancy-Induced Alterations in NK Cell Phenotype and Function
   M. Le Gars, **C. Seiler**, A. Kay N. Bayless, E. Starosvetsky, L. Moore, S. Shen-Orr, N. Aziz, P. Khatri, C. Dekker, G. Swan, M. Davis, S. Holmes, and C. Blish
   Frontiers in Immunology, Volume 10, Article 2469, Pages 1–13, October 2019

9. Differential Induction of IFN-α and Modulation of CD112 and CD54 Expression Govern the Magnitude of NK Cell IFN-γ Response to Influenza A Viruses
   L.M. Kronstad, **C. Seiler**, R. Vergara, S. Holmes, and C. Blish,
   The Journal of Immunology, Volume 201, Issue 7, Pages 2117–2131, October 2018

10. Multi-Table Differential Correlation Analysis of Neuroanatomical and Cognitive Interactions in Turner Syndrome
    C. Seiler, T. Green, D. Hong, L. Chromik, L. Huffman, S. Holmes, and A.L. Reiss
    Neuroinformatics, Volume 16, Issue 1, Pages 81–93, January 2018

11. Multivariate Heteroscedasticity Models for Functional Brain Connectivity
    C. Seiler and S. Holmes
    Frontiers in Neuroscience, Volume 11, Article 696, Pages 1–11, December 2017

12. Image-based vs. Mesh-based Statistical Appearance Model of the Human Femur: Implications for Finite Element Simulations
    S. Bonaretti, **C. Seiler**, C. Boichon, M. Reyes, and P. Büchler
    Medical Engineering and Physics, Volume 36, Issue 12, Pages 1626–1635, December 2014

13. Time-Lapse Microscopy and Classification of 2D Human Mesenchymal Stem Cells Based on Cell Shape Picks Up Myogenic from Osteogenic and Adipogenic Differentiation
    C. Seiler, A. Gazdhar, M. Reyes, L.M. Benneker, T. Geiser, K.A. Siebenrock, and B. Gantenbein-Ritter
    Journal of Tissue Engineering and Regenerative Medicine,
    Volume 8, Issue 9, Pages 737–746, September 2014

14. Discussion of "Geodesic Monte Carlo on Embedded Manifolds"
    P. Diaconis, **C. Seiler**, and S. Holmes
    Scandinavian Journal of Statistics, Volume 41, Issue 1, Pages 3–7, March 2014

15. Validity of an Automatic Measure Protocol in Distal Femur for Allograft Selection from a Three-Dimensional Virtual Bone Bank System
    L. Ritacco, **C. Seiler**, G. Farfalli, L. Nolte, M. Reyes, D. Muscolo, and L. Tinao
    Cell and Tissue Banking, Volume 14, Issue 2, Pages 213–220, June 2013

16. Capturing the Multiscale Anatomical Shape Variability with Polyaffine Transformation Trees
    C. Seiler, X. Pennec, and M. Reyes
    Medical Image Analysis, Volume 16, Issue 7, Pages 1371–1384, October 2012

17. Statistical Model Based Shape Prediction from a Combination of Direct Observations and Various Surrogates: Application to Orthopaedic Research
    R. Blanc, **C. Seiler**, G. Székely, L. Nolte, and M. Reyes
    Medical Image Analysis, Volume 16, Issue 6, Pages 1156–1166, August 2012

Peer-Reviewed Conference and Workshop Papers

1. Simple Sorting Criteria Help Find the Causal Order in Additive Noise Models
   A. Reisach, M. Tami, **C. Seiler**, A. Chambaz, and S. Weichwald
   NeurIPS, New Orleans, LA, US, Pages 785–807, December 2023

2. Conformal Regression in Calorie Prediction for Team Jumbo–Visma
   K. van Kuijk, M. Dirksen, **C. Seiler**
   COPA, Limassol, CY, PMLR, Volume 204, Pages 5–15, September 2023

3. Beware of the Simulated DAG! Causal Discovery Benchmarks May Be Easy to Game
   A. Reisach, **C. Seiler**, and S. Weichwald
   NeurIPS, Virtual-only Conference, Pages 27772–27784, December 2021

4. Positive Curvature and Hamiltonian Monte Carlo
   C. Seiler, S. Rubinstein-Salzedo, and S. Holmes
   NIPS (now NeurIPS), Montreal, CA, Pages 586–594, December 2014

5. Spatio-Temporal Dimension Reduction of Cardiac Motion for Group-Wise Analysis and Statistical Testing
   K. McLeod, **C. Seiler**, M. Sermesant, and X. Pennec
   MICCAI, Nagoya, JP, LNCS, Volume 8150, Part II, Pages 501–508, September 2013

6. Random Spatial Structure of Geometric Deformations and Bayesian Nonparametrics
   C. Seiler, X. Pennec, and S. Holmes
   GSI, Paris, FR, LNCS, Volume 8085, Part III, Pages 120–127, August 2013

7. Regional Analysis of Left Ventricle Function using a Cardiac-Specific Polyaffine Motion Model
   K. McLeod, **C. Seiler**, Nicolas Toussaint, M. Sermesant, and X. Pennec
   FIMH, London, UK, LNCS, Volume 7945, Pages 483–490, June 2013

8. Simultaneous Multiscale Polyaffine Registration by Incorporating Deformation Statistics
   C. Seiler, X. Pennec, and M. Reyes
   MICCAI, Nice, FR, LNCS, Volume 7511, Part II, Pages 130–137, October 2012

9. Population-Based Design of Mandibular Plates Based on Bone Quality and Morphology
   H. Bou-Sleiman, **C. Seiler**, T. Iizuka, L. Nolte, and M. Reyes
   MICCAI, Nice, FR, LNCS, Volume 7510, Part I, Pages 66–73, October 2012

10. A Near-Incompressible Poly-Affine Motion Model for Cardiac Function Analysis
    K. McLeod, **C. Seiler**, A. Prakosa, M. Sermesant, and X. Pennec
    STATCOM Workshop, MICCAI, Nice, FR, October 2012

11. Geometry-Aware Multiscale Image Registration Via OBBTree-Based Polyaffine Log-Demons
    C. Seiler, X. Pennec, and M. Reyes
    MICCAI, Toronto, CA, LNCS, Volume 6892, Part II, Pages 631–638, September 2011

12. Mesh-based vs. Image-based Statistical Model of Appearance of the Human Femur: A Preliminary Comparison Study for the Creation of Finite Element Meshes
    S. Bonaretti, **C. Seiler**, C. Boichon, P. Büchler, and M. Reyes
    MeshMed Workshop, MICCAI, Toronto, CA, September 2011

13. Femur Specific Polyaffine Model to Regularize the Log-domain Demons Registration
    C. Seiler, X. Pennec, L. Ritacco, and M. Reyes
    SPIE Medical Imaging (Image Processing), Orlando, US, February 2011

14. Atlas-Based Segmentation of Brain Tumor Images Using a Markov Random Field-Based Tumor Growth Model and Non-Rigid Registration
    S. Bauer, **C. Seiler**, T. Bardyn, P. Büchler, and M. Reyes
    EMBC, Buenos Aires, AR, Pages 4080–4083, September 2010

15. Parametric Regression of 3D Medical Images Through the Exploration of Non-Parametric Regression Models
    C. Seiler, X. Pennec, and M. Reyes
    ISBI, Rotterdam, NL, Pages 452–455, April 2010

16. Combined Statistical Model of Bone Shape and Mechanical Properties for Bone and Implant Modeling
    S. Bonaretti, M. Kistler, **C. Seiler**, M. Reyes, and P. Büchler
    CMBBE, Valencia, ES, February 2010

17. Conditional Variability of Statistical Shape Models Based on Surrogate Variables
    R. Blanc, M. Reyes, **C. Seiler**, and G. Székely
    MICCAI, London, UK, LNCS, Volume 5762, Part II, Pages 84–91, September 2009

Peer-Reviewed Book Chapters

1. Bayesian Statistics in Computational Anatomy
   C. Seiler
   Statistical Shape and Deformation Analysis: Methods, Implementations & Applications (G. Zheng, S. Li, and G. Székely, eds.), Chapter 8, Academic Press, March 2017, Pages 193–214

2. Hierarchical Markov Random Fields Applied to Model Soft Tissue Deformations on Graphics Hardware
   C. Seiler, P. Büchler, L.-P. Nolte, R. Paulsen, and M. Reyes
   Recent Advances in the 3D Physiological Human (N. Magnenat-Thalmann, J.J. Zhang, and D.D. Feng, eds.), Chapter 9, Springer London, July 2009, Pages 133–148

Unrefereed Preprints

1. NKp30 and NKG2D Contribute to Natural Killer Recognition of HIV-Infected Cells
   N. Zhao, R. Pi, Ruoxi, D. Nguyen, T. Ranganath, **C. Seiler**, S. Holmes, A. Marson, and C. Blish
   https://doi.org/10.1101/2024.06.24.600449

2. Spatial Patterns of Dental Disease in Patients with Low Salivary Flow
   D. Proctor, **C. Seiler**, A. Burns, S. Walker, T. Jung, J. Weng, S. Sastiel, Y. Rajendran, Y. Kapila, M. Millman, G. Armitage, P. Loomer, S. Holmes, M. Ryder, and D. Relman
   https://doi.org/10.1101/2021.10.04.21264534

3. Uncertainty Quantification in Multivariate Mixed Models for Mass Cytometry Data
   C. Seiler, L. Kronstad, L. Simpson, M. Le Gars, E. Vendrame, C. Blish, and S. Holmes
   https://arxiv.org/abs/1903.07976

4. CD38 Contributes to Human Natural Killer Cell Responses Through a Role in Immune Synapse Formation
   M. Le Gars, **C. Seiler**, A. Kay, N. Bayless, E. Sola, E. Starosvetsky, L. Moore, S. Shen-Orr, N. Aziz, P. Khatri, C. Dekker, G. Swan, M. Davis, S. Holmes, Catherine A. Blish
   https://doi.org/10.1101/349084

5. Curvature and Concentration of Hamiltonian Monte Carlo in High Dimensions
   S. Holmes, S. Rubinstein-Salzedo, and **C. Seiler**
   https://arxiv.org/abs/1407.1114