

# CV – Christof Seiler

Department of Data Science and Knowledge Engineering, Maastricht University  
Paul-Henri Spaaklaan 1, 6229 EN, Maastricht, The Netherlands  
<https://christofseiler.github.io/>

## Education

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

## Employment

10/2018–present	<b>Tenure-Track Assistant Professor of Statistics</b> , Department of Data Science and Knowledge Engineering (DKE), Mathematics Centre Maastricht, Maastricht University, The Netherlands
01/2018–07/2018 01/2013–12/2017	Research Scientist in Statistics, Postdoctoral Researcher in Statistics, Department of Statistics, Stanford University, CA, United States
03/2017–05/2017	EPFL (École polytechnique fédérale de Lausanne)-Stanford Exchange Fellow, Hosted by Dimitri Van De Ville, EPFL, MIP:Lab, Switzerland
10/2010–09/2012	Doctoral Researcher, Asclepios (now Epione) Research Group, Inria Sophia Antipolis, France
07/2008–09/2012	Doctoral Researcher, Institute for Surgical Technology and Biomechanics (ISTB), University of Bern, Switzerland
09/2010–12/2010	Visiting Graduate Fellow, Statistical and Applied Mathematical Sciences Institute (SAMSI), Durham, NC, United States
12/2006–05/2008	Software Engineer, Integrated Scientific Services AG, Biel, Switzerland
02/2006–12/2006	Software Engineer, Institute for Evaluative Research in Medicine, University of Bern, Switzerland
02/2005–04/2005	Software Engineering Consultant, Oridus Inc., Biel, Switzerland
09/2003–08/2004	Software Engineering Intern, Oridus Inc., Fremont, CA, United States

## Fellowships, Grants & Awards

2017	EPFL-Stanford exchange program fellowship (\$11,000)
2016	ISBA new researchers travel award, Sardinia, Italy (gratefully declined)
2015	Conference on Bayesian Nonparametrics travel award, Raleigh, NC
2015	<b>Swiss NSF Fellowship for Advanced Researchers</b> (\$49,400)
2013–2014	France-Stanford collaborative project grant (\$14,850)
2013–2014	<b>Swiss NSF Fellowship for Prospective Researchers</b> (\$89,000)
2011	<b>MICCAI Young Scientist Award</b> , Toronto, Canada (top 5 of about 819 submitted papers by PhD students and postdocs)
2011	MICCAI student travel award, Toronto, Canada
2011	Paper invitation for the journal Medical Image Analysis (invitation rate $\approx 1.5\%$ )
2010	Swiss SERI scholarship for joint PhD in France and Switzerland ( $\approx \$10,000$ )

## Teaching

	<b>Courses at Maastricht University</b>
Winter 2020–	KEN4258: Computational Statistics (MSc): Designer & lecturer
Spring 2019–	KEN2130: Probability and Statistics (BSc): Designer & lecturer
Spring 2019–	KEN1520: Software Engineering (BSc): Designer & co-lecturer
Winter 2019	MAT2006: Calculus (BSc): Lecturer
Summer 2019	Data Science School (BSc/MSc/PhD/Postdoc): Co-designer & co-lecturer
	<b>Courses at Stanford University</b>
Summer 2018	Stats 366/Bios 221: Modern Statistics for Modern Biology (PhD/Postdoc): Guest lecturer
Summer 2017	Stats 366/Bios 221: Modern Statistics for Modern Biology (PhD/Postdoc): Teaching assistant
Spring 2016	Stats 205: Introduction to Nonparametric Statistics (MSc): Designer & lecturer Course website: <a href="https://christofseiler.github.io/stats205/">https://christofseiler.github.io/stats205/</a>
	<b>Courses at ETH Zürich and University of Bern</b>
Fall 2008–2009	Medical Image Analysis (MSc): Guest lecturer

## Supervision and Mentoring

	<b>Postdoctoral Student at Stanford University</b>
2017–2018	Diana Proctor (Stanford University School of Medicine)
	<b>MSc Students at Maastricht University (24 students)</b>
	<b>Theses:</b>
2021–	Alexander Reisach (Helmholtz Center Munich, Germany)
2020–2021	Ariadna Saladrigas Pernias (AkzoNobel, The Netherlands), Thomas Wall (Eurocontrol MUAC, The Netherlands), Aleksander Michoński (DKE), Magnus Kinder (DKE), Stephan Delhey (HotSprings GmbH, Germany)
2019–2020	Casper Hogenboom (ING, The Netherlands), Christian Heil (Deutsche Bahn, Germany), Philippe Debie (School of Business and Economics), Kamil Bujnarowski (DKE), Martyna Mikos (EDGE Technologies, The Netherlands), Max Bremer (IVU Traffic Technologies AG, Germany), Yeritsyan Armen (EUTech Scientific Engineering GmbH, Germany)
	<b>Internships:</b>
2020–2021	Lucy Quirant (Biberach an der Riss, Germany), Pranav Bapat (AMF Bakery Systems, The Netherlands), Ammar Bitar (Intel Labs, Germany), Alexander Reisach (Copenhagen Causality Lab, University of Copenhagen, Denmark), Julian Posch (Maastricht), Vasco Prudent (Maastricht), Roya Shahkouei (Coca-Cola, The Netherlands), Tom Dooney (SABIC, The Netherlands)
2019–2020	Julius Haring (HotSprings GmbH, Germany), Stephan Delhey (HotSprings GmbH, Germany), Martyna Mikos (EDGE Technologies, The Netherlands)
	<b>BSc Students at Maastricht University (10 students)</b>
	<b>Thesis:</b>
2021	Anna-Lena Krause (Statistics Netherlands), Arabi Alhumsi (University College Maastricht), Krzysztof Cybulski (Statistics Netherlands), Iga Joanna Skorupska (Aucos AG, Germany)
2019	Lucy Quirant (University College Maastricht)
	<b>Internships:</b>
2021–	Kristian van Kuijk (Visma Connect, The Netherlands)
2019–2021	Anna-Lena Krause (Statistics Netherlands), Yiping Huang (Statistics Netherlands), Tu Anh Dinh (Mediaan, The Netherlands)
2019–2020	Laura Joegi (Mediaan, The Netherlands)
	<b>BSc Student at Stanford University</b>
2017–2018	Samuel Walker (UCSF)
	<b>BSc Student at University of Bern</b>
2010	Konrad Moser (University of Applied Sciences, Brugg, Switzerland)

## Open Source Software Contributions

	<b>R packages:</b>
2019	CytoGLMM: Conditional differential analysis for flow and mass cytometry experiments <a href="https://bioconductor.org/packages/CytoGLMM/">https://bioconductor.org/packages/CytoGLMM/</a>
2019	cytoeffect: Multivariate outcomes regression for mass cytometry experiments <a href="https://christofseiler.github.io/cytoeffect/">https://christofseiler.github.io/cytoeffect/</a>
2017	CovRegFC: Multivariate heteroscedasticity models for fMRI <a href="https://github.com/ChristofSeiler/CovRegFC">https://github.com/ChristofSeiler/CovRegFC</a>
2017	braincog: Differential correlation analysis between MRI and cognitive tests <a href="https://github.com/ChristofSeiler/braincog">https://github.com/ChristofSeiler/braincog</a>
2017	curvature: Convergence diagnosis of Hamiltonian Monte Carlo <a href="https://github.com/ChristofSeiler/curvature">https://github.com/ChristofSeiler/curvature</a>
	<b>C++, C, and C for Graphics (Cg) tools:</b>
2015	Bayesian medical image registration <a href="https://github.com/ChristofSeiler/BayesianImageRegistration">https://github.com/ChristofSeiler/BayesianImageRegistration</a>
2014	Bayesian nonparametric clustering of vector fields for medical images <a href="https://github.com/ChristofSeiler/BayesianNonparametrics">https://github.com/ChristofSeiler/BayesianNonparametrics</a>
2012	Tree structured medical image registration <a href="https://github.com/ChristofSeiler/PolyaffineTransformationTrees">https://github.com/ChristofSeiler/PolyaffineTransformationTrees</a>
2009	Soft tissue deformations with Markov random fields on the GPU <a href="https://github.com/ChristofSeiler/SoftTissueDeformations">https://github.com/ChristofSeiler/SoftTissueDeformations</a>
	<b>MATLAB workflow:</b>
2012	Cell shape classifier for time-lapse microscopy <a href="https://github.com/ChristofSeiler/CellShapeClassifier">https://github.com/ChristofSeiler/CellShapeClassifier</a>

## Reviewer for Journals and Conferences

Since 2020	Electronic Journal of Statistics, IEEE Journal of Biomedical and Health Informatics, Briefings in Bioinformatics
Since 2019	Journal of Machine Learning Research, Journal of Computational and Graphical Statistics
2019	Neurocomputing
Since 2014	Annals of Applied Statistics
Since 2013	Medical Image Analysis
Since 2012	IPMI (acceptance rate $\approx 28\%$ )
2012–2017	MICCAI (acceptance rate $\approx 32\%$ )

## Invited and Contributed Talks

09/2020	Colloquium Meeting, Department of Methodology and Statistics, Maastricht University, The Netherlands
10/2019	Second Dutch Stan Meetup 2019, Utrecht, The Netherlands
09/2019	Basel Life, Basel, Switzerland
12/2018	Data Science Research Seminar, Maastricht University, The Netherlands
03/2018	Department of Statistics, Ludwig-Maximilians-Universität München, Germany
02/2018	School of Mathematical Sciences, Queen Mary University of London, UK
05/2017	Workshop on Statistical Challenges in Single-Cell Biology, Ascona, Switzerland
04/2017	Division of Immunology and Allergy, Lausanne University Hospital (CHUV), Lausanne, Switzerland
04/2017	CyTOF Working Group, Institute for Immunity, Transplantation and Infection, Stanford University, CA, United States
03/2017	MIP:Lab, EPFL, Campus Biotech, Geneva, Switzerland
03/2017	Bioinformatics Core Facility, SIB Swiss Institute of Bioinformatics, Lausanne, Switzerland
6/2015	10th Conference on Bayesian Nonparametrics, Raleigh, NC, United States
3/2015	Center for Imaging Science, Johns Hopkins, Baltimore, MD, United States
10/2014	Workshop in Biostatistics, Stanford School of Medicine, CA, United States
8/2014	JSM (the Joint Statistical Meetings), Boston, MA, United States
5/2014	Inria Sophia Antipolis, Sophia Antipolis, France
3/2014	Institut de Mathématiques de Toulouse, Université Paul Sabatier, France
10/2013	Stanford Statistics Seminar, CA, United States
8/2013	Geometric Science of Information, Paris, France
3/2013	Computational People United at Stanford, CA, United States
3/2013	Artorg Center, University of Bern, Switzerland
9/2011	MICCAI, Toronto, Canada (acceptance rate 4.2% out of 819 papers)
2/2011	SPIE Medical Imaging, Orlando, FL, United States
6/2010	TERMIS, Galway, Ireland
6/2009	CAOS, Boston, MA, United States
12/2008	3D Physiological Human, Zermatt, Switzerland

## List of Publications

Same list with links to articles: <https://christofseiler.github.io/publications/>

## Preprints

1. Beware of the Simulated DAG! Varsortability in Additive Noise Models  
A. Reisach, **C. Seiler**, and S. Weichwald  
<https://arxiv.org/abs/2102.13647>
2. 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>
3. CD38 Is a Key Regulator of Enhanced NK Cell Immune Responses During Pregnancy Through its Role in Immune Synapse Formation  
M. Le Gars, **C. Seiler**, A. Kay, N. Bayless, E. Starosvetsky, L. Moore, S. Shen-Orr, N. Aziz, C. Dekker, P. Khatri, G. Swan, M. Davis, S. Holmes, and C. Blish  
<https://www.biorxiv.org/content/10.1101/349084v2>
4. Curvature and Concentration of Hamiltonian Monte Carlo in High Dimensions  
S. Holmes, S. Rubinstein-Salzedo, and **C. Seiler**  
<https://arxiv.org/abs/1407.1114>

## Peer-Reviewed Journal Articles

1. 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, March 2021, Pages 1–14
2. 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, September 2020, Pages 1–17
3. 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, April 2020, Pages 1–13
4. 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, March 2020, Pages 1–10
5. 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, A.-C. Labbé, F. Guédou, J. Poudrier, S. Holmes, M. Roger, and C. Blish  
AIDS, Volume 34, Issue 6, May 2020, Pages 801–813
6. 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, October 2019, Pages 1–13
7. Differential Induction of IFN- $\alpha$  and Modulation of CD112 and CD54 Expression Govern the Magnitude of NK Cell IFN- $\gamma$  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, October 2018, Pages 2117–2131
  8. 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, January 2018, Pages 81–93
  9. Multivariate Heteroscedasticity Models for Functional Brain Connectivity  
**C. Seiler** and S. Holmes  
Frontiers in Neuroscience, Volume 11, Article 696, December 2017, Pages 1–11
  10. 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, December 2014, Pages 1626–1635
  11. 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, September 2014, Pages 737–746
  12. Discussion of “Geodesic Monte Carlo on Embedded Manifolds”  
P. Diaconis, **C. Seiler**, and S. Holmes  
Scandinavian Journal of Statistics, Volume 41, Issue 1, March 2014, Pages 3–7
  13. 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, June 2013, Pages 213–220
  14. Capturing the Multiscale Anatomical Shape Variability with Polyaffine Transformation Trees  
**C. Seiler**, X. Pennec, and M. Reyes  
Medical Image Analysis, Volume 16, Issue 7, October 2012, Pages 1371–1384
  15. 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, August 2012, Pages 1156–1166

### 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

### Peer-Reviewed Conference and Workshop Papers

1. Positive Curvature and Hamiltonian Monte Carlo  
**C. Seiler**, S. Rubinstein-Salzedo, and S. Holmes  
 NIPS, Montreal, Canada, December, 2014, Pages 586–594  
 (acceptance rate: 414 of 1678 papers = 25%)
2. 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, Japan, LNCS, Volume 8150, Part II, September 2013, Pages 501–508  
 (acceptance rate: 262 of 798 papers = 33%)
3. Random Spatial Structure of Geometric Deformations and Bayesian Nonparametrics  
**C. Seiler**, X. Pennec, and S. Holmes  
 GSI, Paris, France, LNCS, Volume 8085, Part III, August 2013, Pages 120–127
4. 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, June 2013, Pages 483–490
5. Simultaneous Multiscale Polyaffine Registration by Incorporating Deformation Statistics  
**C. Seiler**, X. Pennec, and M. Reyes  
 MICCAI, Nice, France, LNCS, Volume 7511, Part II, October 2012, Pages 130–137  
 (acceptance rate: 248 of 779 papers = 32%)
6. 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, France, LNCS, Volume 7510, Part I, October 2012, Pages 66–73  
 (acceptance rate: 248 of 779 papers = 32%)
7. 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, France, October 2012
8. Geometry-Aware Multiscale Image Registration Via OBBTree-Based Polyaffine Log-Demons  
**C. Seiler**, X. Pennec, and M. Reyes  
 MICCAI, Toronto, Canada, LNCS, Volume 6892, Part II, September 2011, Pages 631–638  
 Young Scientist Award  
 (top 5 out of the majority of 819 papers written by PhD students and postdocs)  
 Student Travel Award and Oral Podium Presentation  
 (acceptance rate: 34 of 819 papers = 4.2%)
9. 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, Canada, September 2011



10. 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, USA, February 2011
11. 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. Baryn, P. Büchler, and M. Reyes  
 EMBC, Buenos Aires, Argentina, September 2010, Pages 4080–4083
12. Parametric Regression of 3D Medical Images Through the Exploration of Non-Parametric Regression Models  
**C. Seiler**, X. Pennec, and M. Reyes  
 ISBI, Rotterdam, The Netherlands, April 2010, Pages 452–455
13. 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, Spain, February 2010
14. 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, September 2009, Pages 84–91  
 (acceptance rate: 32%)

#### Conference Abstracts

1. Mesenchymal Stem Cell Classification During Differentiation Based on Shape Information  
**C. Seiler**, A. Gazdhar, T. Geiser, M. Reyes, and B. Gantenbein-Ritter  
 TERMIS, Galway, Ireland, June 2010
2. Automatic Landmark Propagation for Left and Right Symmetry Assessment of Tibia and Femur: A Computational Anatomy Based Approach  
**C. Seiler**, S. Weber, W. Schmidt, F. Fischer, N. Reimers, and M. Reyes  
 CAOS, Boston, USA, June 2009