

# CV – Christof Seiler

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Knowledge Engineering  
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<http://christofseiler.github.io/>

## Education

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

## Employment

|                                    |  |
|------------------------------------|--|
| 10/2018–present                    | <b>Tenure-Track Assistant Professor of Statistics</b> ,<br>Department of Data Science and Knowledge Engineering,<br>Mathematics Centre Maastricht,<br>Maastricht University, The Netherlands |
| 01/2018–07/2018<br>01/2013–12/2017 | Research Scientist in Statistics,<br>Postdoctoral Researcher in Statistics,<br>Department of Statistics,<br>Stanford University, CA, United States   |
| 03/2017–05/2017                    | EPFL (École polytechnique fédérale de Lausanne)-Stanford Exchange Fellow,<br>Hosted by Dimitri Van De Ville, EPFL, MIP:Lab, Switzerland  |
| 10/2010–09/2012                    | Doctoral Researcher,<br>Asclepios (now Epione) Research Group,<br>Inria Sophia Antipolis, France   |
| 07/2008–09/2012                    | Doctoral Researcher,<br>Institute for Surgical Technology and Biomechanics (ISTB),<br>University of Bern, Switzerland  |
| 09/2010–12/2010                    | Visiting Graduate Fellow,<br>Statistical and Applied Mathematical Sciences Institute (SAMSI),<br>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<br>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   |

## Grants and Awards

|           |  |
|-----------|--|
| 2017      | EPFL-Stanford Exchange Program Fellowship (funded by Firmenich)  |
| 2016      | ISBA New Researchers Travel Award, Sardinia, Italy (gratefully declined)   |
| 2015      | Travel award for Conference on Bayesian Nonparametrics, Raleigh, NC  |
| 2015      | <b>Swiss NSF Fellowship for Advanced Researchers</b><br>(one year, topic: Uncertainty in Computational Anatomy)                              |
| 2013–2014 | France-Stanford Collaborative Projects Grant   |
| 2013–2014 | <b>Swiss NSF Fellowship for Prospective Researchers</b><br>(two years, topic: Monte Carlo Methods in Computational Anatomy)                  |
| 2011      | <b>MICCAI Young Scientist Award</b> , Toronto, Canada<br>(top five of about 819 submitted papers by PhD students and postdocs)               |
| 2011      | MICCAI Student Travel Award, Toronto, Canada   |
| 2011      | Paper invitation for Medical Image Analysis (invitation rate $\approx 1.5\%$ )   |
| 2010      | Financial support for joint PhD to travel between France and Switzerland<br>(Swiss State Secretariat for Education, Research and Innovation) |

## Teaching

|                |   |
|----------------|---|
| Winter 2020–   | <b>KEN4258: Computational Statistics</b> (MSc)<br>Coordinator, designer, lecturer, examiner, Maastricht University  |
| Spring 2019–   | <b>KEN2130: Probability and Statistics</b> (BSc)<br>Coordinator, designer, lecturer, examiner, Maastricht University  |
| Spring 2019–   | KEN1520: Software Engineering (BSc)<br>Coordinator, designer, co-lecturer, co-examiner, Maastricht University   |
| Winter 2019    | MAT2006: Calculus (BSc)<br>Lecturer, Maastricht University  |
| Summer 2019    | Data Science School (BSc/MSc/PhD/Postdoc)<br>Co-designer, co-lecturer, Maastricht University  |
| Summer 2017    | Stats 366/Bios 221: Modern Statistics for Modern Biology (PhD/Postdoc)<br>Guest lecturer, Stanford University<br>Course website: <a href="http://web.stanford.edu/class/bios221/">http://web.stanford.edu/class/bios221/</a>                            |
| Summer 2017    | Stats 366/Bios 221: Modern Statistics for Modern Biology (PhD/Postdoc)<br>Teaching assistant, Stanford University<br>Course website: <a href="http://web.stanford.edu/class/bios221/">http://web.stanford.edu/class/bios221/</a>                        |
| Spring 2016    | <b>Stats 205: Introduction to Nonparametric Statistics</b> (MSc)<br>Coordinator, designer, lecturer, examiner, Stanford University<br>Course website: <a href="http://christofseiler.github.io/stats205/">http://christofseiler.github.io/stats205/</a> |
| Fall 2008–2009 | Medical Image Analysis<br>Guest lecturer, ETH Zürich and University of Bern, Switzerland  |

## Supervision and Mentoring

|           |   |
|-----------|---|
|           | <b>Postdoctoral students:</b>   |
| 2017–2018 | Diana Proctor, mentor, Stanford University  |
|           | <b>MSc students:</b>  |
| 2020      | Casper Hogenboom, thesis supervisor, Maastricht University<br>(with ING, The Netherlands)                                     |
| 2020      | Christian Heil, thesis supervisor, Maastricht University<br>(with Deutsche Bahn, Germany)                                     |
| 2020      | Kamil Bujnarowski, co-supervisor, Maastricht University   |
| 2020      | Martyna Mikos, thesis co-supervisor, Maastricht University<br>(with EDGE Technologies, The Netherlands)                       |
| 2020      | Max Bremer, thesis supervisor, Maastricht University<br>(with IVU Traffic Technologies AG, Germany)                           |
| 2020      | Philippe Debie, thesis co-supervisor, Maastricht University<br>(with School of Business and Economics, Maastricht University) |
| 2020      | Yeritsyan Armen, thesis co-supervisor, Maastricht University<br>(with EUTech Scientific Engineering GmbH, Germany)            |
| 2019      | Martyna Mikos, internship supervisor, Maastricht University<br>(with EDGE Technologies, The Netherlands)                      |
|           | <b>BSc students:</b>  |
| 2019–     | Anna-Lena Krause, KE@Work, supervisor, Maastricht University<br>Two year internship program at Statistics Netherlands (CBS)   |
| 2019–     | Yiping Huang, KE@Work, supervisor, Maastricht University<br>Two year internship program at Statistics Netherlands (CBS)       |
| 2019–     | Tu Anh Dinh, KE@Work, supervisor, Maastricht University<br>Two year internship program at Mediaan, The Netherlands            |
| 2019–2020 | Laura Joegi, KE@Work, supervisor, Maastricht University<br>One year internship program at Mediaan, The Netherlands            |
| 2019      | Lucy Quirant, thesis supervisor, Maastricht University  |
| 2017–2018 | Samuel Walker, mentor, UCSF   |
| 2010      | Konrad Moser, co-supervisor, University of Applied Sciences, Brugg  |

## Open Source Software Contributions

|      |  |
|------|--|
|      | <b>R packages:</b>   |
| 2019 | <i>cytoeffect</i> : Multidimensional differential analysis for mass cytometry<br><a href="https://christofseiler.github.io/CytoGLMM/">https://christofseiler.github.io/CytoGLMM/</a>                     |
| 2019 | <i>CytoGLMM</i> : Cell type specific differential analysis for mass cytometry<br><a href="https://christofseiler.github.io/cytoeffect/">https://christofseiler.github.io/cytoeffect/</a>                 |
| 2017 | <i>CovRegFC</i> : Multivariate heteroscedasticity models for fMRI<br><a href="https://github.com/ChristofSeiler/CovRegFC">https://github.com/ChristofSeiler/CovRegFC</a>                                 |
| 2017 | <i>braincog</i> : Differential correlation analysis between MRI and cognitive tests<br><a href="https://github.com/ChristofSeiler/braincog">https://github.com/ChristofSeiler/braincog</a>               |
| 2017 | <i>curvature</i> : Convergence diagnosis of Hamiltonian Monte Carlo<br><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<br><a href="https://github.com/ChristofSeiler/BayesianImageRegistration">https://github.com/ChristofSeiler/BayesianImageRegistration</a>                             |
| 2014 | Bayesian nonparametric clustering of vector fields for medical images<br><a href="https://github.com/ChristofSeiler/BayesianNonparametrics">https://github.com/ChristofSeiler/BayesianNonparametrics</a> |
| 2012 | Tree structured medical image registration<br><a href="https://github.com/ChristofSeiler/PolyaffineTransformationTrees">https://github.com/ChristofSeiler/PolyaffineTransformationTrees</a>              |
| 2009 | Soft tissue deformations with Markov random fields on the GPU<br><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<br><a href="https://github.com/ChristofSeiler/CellShapeClassifier">https://github.com/ChristofSeiler/CellShapeClassifier</a>                             |

## Reviewer for Journals and Conferences

|            |   |
|------------|---|
| Since 2020 | Briefings in Bioinformatics                       |
| Since 2019 | Journal of Machine Learning Research              |
| Since 2019 | 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,<br>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,<br>Maastricht University, The Netherlands   |
| 03/2018 | Department of Statistics,<br>Ludwig-Maximilians-Universität München, Germany   |
| 02/2018 | School of Mathematical Sciences,<br>Queen Mary University of London, UK  |
| 05/2017 | Workshop on Statistical Challenges in Single-Cell Biology,<br>Ascona, Switzerland  |
| 04/2017 | Division of Immunology and Allergy,<br>Lausanne University Hospital (CHUV), Lausanne, Switzerland                        |
| 04/2017 | CyTOF Working Group,<br>Institute for Immunity, Transplantation and Infection,<br>Stanford University, CA, United States |
| 03/2017 | MIP:Lab, EPFL, Campus Biotech, Geneva, Switzerland   |
| 03/2017 | Bioinformatics Core Facility, SIB Swiss Institute of Bioinformatics,<br>Lausanne, Switzerland                            |
| 6/2015  | 10th Conference on Bayesian Nonparametrics,<br>Raleigh, NC, United States  |
| 3/2015  | Center for Imaging Science,<br>Johns Hopkins, Baltimore, MD, United States   |
| 10/2014 | Workshop in Biostatistics,<br>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,<br>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: <http://christofseiler.github.io/publications/>

## Preprints

1. Uncertainty Quantification in Multivariate Mixed Models for Mass Cytometry Data  
**C. Seiler**, L. Kronstad, L. Simpson, M. Le Gars, E. Vendrame, C. Blish, S. Holmes  
<https://arxiv.org/abs/1903.07976>
2. 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, C. Blish  
<https://doi.org/10.1101/349084>
3. Curvature and Concentration of Hamiltonian Monte Carlo in High Dimensions  
S. Holmes, S. Rubinstein-Salzedo, and **C. Seiler**  
<http://arxiv.org/abs/1407.1114>

## Peer-Reviewed Journal Articles

1. 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, C. Blish  
PLOS ONE, Volume 15, Issue 9, September 2020, Pages 1–17
2. 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
3. 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
4. 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
5. 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
6. 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

7. 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
8. Multivariate Heteroscedasticity Models for Functional Brain Connectivity  
**C. Seiler** and S. Holmes  
 Frontiers in Neuroscience, Section Brain Imaging Methods,  
 Volume 11, Article 696, December 2017, Pages 1–11
9. 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
10. 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
11. 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
12. 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
13. 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
14. 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. Bardyn, 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