# Øystein Sørensen

## Associate Professor

#### Education

- 2011–2015 **PhD in Statistics**, *University of Oslo*, Oslo, Norway.
  - o Thesis: Rank and Measurement Error Modeling for Robust Genomic Inference
  - o Supervisors: Magne Thoresen and Arnoldo Frigessi
- 2006–2011 **MsC in Biological Physics**, Norwegian University of Life Sciences, Ås, Norway.
  - o Thesis: Modeling of Extracellular Potentials Measured by Microelectrode Arrays
  - o Thesis supervisor: Gaute Einevoll

### Experience

- 2018– Associate Professor, University of Oslo, Oslo, Norway.
- present o Tenure-track position at the Center for Lifespan Changes in Brain and Cognition, Department of Psychology.
- 2018–2018 Postdoctoral Researcher, University of Oslo, Oslo, Norway.
- 2016–2018 Data Scientist, NextBridge Analytics, Oslo, Norway.
  - o Consultant implementing advanced analytics and machine learning solutions for clients across a wide range of sectors.
- 2014–2016 Analyst/Data Scientist, Storebrand Life Insurance, Oslo, Norway.
  - o Developed predictive analytics and data management solutions for the B2B market
- 2011–2014 PhD Student, University of Oslo, Oslo, Norway.
  - ${\tt o}$  Four-year position with 25 % teaching duties. Finished 6 months ahead of time.

#### Editorial Boards

2021-present Associate Editor, Journal of Open Source Software.

#### **Grants**

- 2022–2026 Does sleep duration affect the brain? (PI: Anders M Fjell), Leader of work package on statistical modeling.
  - o ES682301, Project number: 325878, Funder: The Research Council of Norway. NOK 12,000,000.

- 2020–2024 Exploring the Causal Effects of Immune Responses to Cognitive and Mental Health Integrating Large-scale Genomics with Longitudinal Studies (PI: Yunpeng Wang), Leader of work package on longitudinal modeling.
  - o ES659918, Project number: 302854, Funder: FRIPRO Young research talents, The Research Council of Norway. NOK 8,000,000.

#### Publications

See my Google Scholar profile for further information.

#### First Author Publications

- 2021 Sørensen, Øystein; Walhovd, Kristine B.; Fjell, Anders M., A Recipe for Accurate Estimation of Lifespan Brain Trajectories, Distinguishing Longitudinal and Cohort Effects, NeuroImage. http://doi.org/10.1016/j.neuroimage. 2020.117596.
- 2021 Sørensen, Øystein; Brandmaier, Andreas M.; Macià, Dídac; Ebmeier, Klaus; Ghisletta, Paolo; Kievit, Rogier A.; Mowinckel, Athanasia M.; Walhovd, Kristine B.; Westerhausen, Rene; Fjell, Anders, Meta-Analysis of Generalized Additive Models in Neuroimaging Studies, NeuroImage. http://doi.org/10.1016/j.neuroimage.2020.117416.
- 2020 Sørensen, Øystein; Westerhausen, Rene, From Observed Laterality to Latent Hemispheric Differences: Revisiting the Inference Problem, Laterality. http://doi.org/10.1080/1357650X.2020.1769124.
- 2020 Sørensen, Øystein; Crispino, Marta; Liu, Qinghua; Vitelli, Valeria, BayesMallows: An R Package for the Bayesian Mallows Model, The R Journal. http://doi.org/10.32614/RJ-2020-026.
- 2019 Sørensen, Øystein, Hdme: High-Dimensional Regression with Measurement Error, Journal of Open Source Software. http://doi.org/10.21105/joss.01404.
- 2018 Sørensen, Øystein; Hellton, Kristoffer Herland; Frigessi, Arnoldo; Thoresen, Magne, Covariate Selection in High-Dimensional Generalized Linear Models With Measurement Error, Journal of Computational and Graphical Statistics. http://doi.org/10.1080/10618600.2018.1425626.
- 2017 Vitelli, Valeria; Sørensen, Øystein; Crispino, Marta; Frigessi, Arnoldo; Arjas, Elja, Probabilistic Preference Learning with the Mallows Rank Model, The Journal of Machine Learning Research.

2015 Sørensen, Øystein; Frigessi, Arnoldo; Thoresen, Magne, Measurement Error in Lasso: Impact and Likelihood Bias Correction, Statistica Sinica. http://doi.org/10.5705/ss.2013.180.

Non First Author Publications

- Vidal-Pineiro, Didac; Wang, Yunpeng; Krogsrud, Stine K; Amlien, Inge K; Baaré, William FC; Bartres-Faz, David; Bertram, Lars; Brandmaier, Andreas M; Drevon, Christian A; Düzel, Sandra; Ebmeier, Klaus; Henson, Richard N; Junqué, Carme; Kievit, Rogier Andrew; Kühn, Simone; Leonardsen, Esten; Lindenberger, Ulman; Madsen, Kathrine S; Magnussen, Fredrik; Mowinckel, Athanasia Monika; Nyberg, Lars; Roe, James M; Segura, Barbara; Smith, Stephen M; Sørensen, Øystein; Suri, Sana; Westerhausen, Rene; Zalesky, Andrew; Zsoldos, Enikő; Walhovd, Kristine Beate; Fjell, Anders, Individual Variations in 'Brain Age' Relate to Early-Life Factors More than to Longitudinal Brain Change, eLife. http://doi.org/10.7554/eLife.69995.
- 2021 Krogsrud, Stine K.; Mowinckel, Athanasia M.; Sederevicius, Donatas; Vidal-Piñeiro, Didac; Amlien, Inge K.; Wang, Yunpeng; Sørensen, Øystein; Walhovd, Kristine B.; Fjell, Anders M., Relationships between Apparent Cortical Thickness and Working Memory across the Lifespan Effects of Genetics and Socioeconomic Status, Developmental Cognitive Neuroscience. http://doi.org/10.1016/j.dcn.2021.100997.
- Walhovd, Kristine B; Fjell, Anders M; Wang, Yunpeng; Amlien, Inge K; Mowinckel, Athanasia M; Lindenberger, Ulman; Düzel, Sandra; Bartrés-Faz, David; Ebmeier, Klaus P; Drevon, Christian A; Baaré, William F C; Ghisletta, Paolo; Johansen, Louise Baruël; Kievit, Rogier A; Henson, Richard N; Madsen, Kathrine Skak; Nyberg, Lars; R Harris, Jennifer; Solé-Padullés, Cristina; Pudas, Sara; Sørensen, Øystein; Westerhausen, René; Zsoldos, Enikő; Nawijn, Laura; Lyngstad, Torkild Hovde; Suri, Sana; Penninx, Brenda; Rogeberg, Ole J; Brandmaier, Andreas M, Education and Income Show Heterogeneous Relationships to Lifespan Brain and Cognitive Differences Across European and US Cohorts, Cerebral Cortex. http://doi.org/10.1093/cercor/bhab248.

- Fjell, Anders Martin; Grydeland, Hakon; Wang, Yunpeng; Amlien, Inge K; Bartres-Faz, David; Brandmaier, Andreas M; Düzel, Sandra; Elman, Jeremy; Franz, Carol E; Håberg, Asta K; Kietzmann, Tim C; Kievit, Rogier Andrew; Kremen, William S; Krogsrud, Stine K; Kühn, Simone; Lindenberger, Ulman; Macía, Didac; Mowinckel, Athanasia Monika; Nyberg, Lars; Panizzon, Matthew S; Solé-Padullés, Cristina; Sørensen, Øystein; Westerhausen, Rene; Walhovd, Kristine Beate, The Genetic Organization of Longitudinal Subcortical Volumetric Change Is Stable throughout the Lifespan, eLife. http://doi.org/10.7554/eLife.66466.
- 2021 Nyberg, Lars; Magnussen, Fredrik; Lundquist, Anders; Baaré, William; Bartrés-Faz, David; Bertram, Lars; Boraxbekk, C. J.; Brandmaier, Andreas M.; Drevon, Christian A.; Ebmeier, Klaus; Ghisletta, Paolo; Henson, Richard N.; Junqué, Carme; Kievit, Rogier; Kleemeyer, Maike; Knights, Ethan; Kühn, Simone; Lindenberger, Ulman; Penninx, Brenda W. J. H.; Pudas, Sara; Sørensen, Øystein; Vaqué-Alcázar, Lídia; Walhovd, Kristine B.; Fjell, Anders M., Educational Attainment Does Not Influence Brain Aging, Proceedings of the National Academy of Sciences. http://doi.org/10.1073/pnas.2101644118.
- Grydeland, Håkon; Sederevičius, Donatas; Wang, Yunpeng; Bartrés-Faz, David; Bertram, Lars; Dobricic, Valerija; Düzel, Sandra; Ebmeier, Klaus P; Lindenberger, Ulman; Nyberg, Lars; Pudas, Sara; Sexton, Claire E; Solé-Padullés, Cristina; Sørensen, Øystein; Walhovd, Kristine B; Fjell, Anders M, Self-Reported Sleep Relates to Microstructural Hippocampal Decline in β-Amyloid Positive Adults beyond Genetic Risk, Sleep. http://doi.org/10.1093/sleep/zsab110.
- Vidal-Pineiro, Didac; Sneve, Markus H; Amlien, Inge K; Grydeland, Håkon; Mowinckel, Athanasia M; Roe, James M; Sørensen, Øystein; Nyberg, Lars H; Walhovd, Kristine B; Fjell, Anders M, The Functional Foundations of Episodic Memory Remain Stable Throughout the Lifespan, Cerebral Cortex. http://doi.org/10.1093/cercor/bhaa348.
- Roe, James M.; Vidal-Piñeiro, Didac; Sørensen, Øystein; Brandmaier, Andreas M.; Düzel, Sandra; Gonzalez, Hector A.; Kievit, Rogier A.; Knights, Ethan; Kühn, Simone; Lindenberger, Ulman; Mowinckel, Athanasia M.; Nyberg, Lars; Park, Denise C.; Pudas, Sara; Rundle, Melissa M.; Walhovd, Kristine B.; Fjell, Anders M.; Westerhausen, Rene, Asymmetric Thinning of the Cerebral Cortex across the Adult Lifespan Is Accelerated in Alzheimer's Disease, Nature Communications. http://doi.org/10.1038/s41467-021-21057-y.

- Vidal-Pineiro, Didac; Parker, Nadine; Shin, Jean; French, Leon; Grydeland, Håkon; Jackowski, Andrea P.; Mowinckel, Athanasia M.; Patel, Yash; Pausova, Zdenka; Salum, Giovanni; Sørensen, Øystein; Walhovd, Kristine B.; Paus, Tomas; Fjell, Anders M., Cellular Correlates of Cortical Thinning throughout the Lifespan, Scientific Reports. http://doi.org/10.1038/s41598-020-78471-3.
- 2020 Walhovd, Kristine B.; Bråthen, Anne Cecilie Sjøli; Panizzon, Matthew S.; Mowinckel, Athanasia M.; Sørensen, Øystein; de Lange, Ann-Marie G.; Krogsrud, Stine Kleppe; Håberg, Asta; Franz, Carol E.; Kremen, William S.; Fjell, Anders M., Within-Session Verbal Learning Slope Is Predictive of Lifespan Delayed Recall, Hippocampal Volume, and Memory Training Benefit, and Is Heritable, Scientific Reports. http://doi.org/10.1038/s41598-020-78225-1.
- Fjell, Anders M; Sørensen, Øystein; Amlien, Inge K; Bartrés-Faz, David; Brandmaier, Andreas M; Buchmann, Nikolaus; Demuth, Ilja; Drevon, Christian A; Düzel, Sandra; Ebmeier, Klaus P; Ghisletta, Paolo; Idland, Ane-Victoria; Kietzmann, Tim C; Kievit, Rogier A; Kühn, Simone; Lindenberger, Ulman; Magnussen, Fredrik; Macià, Didac; Mowinckel, Athanasia M; Nyberg, Lars; Sexton, Claire E; Solé-Padullés, Cristina; Pudas, Sara; Roe, James M; Sederevicius, Donatas; Suri, Sana; Vidal-Piñeiro, Didac; Wagner, Gerd; Watne, Leiv Otto; Westerhausen, René; Zsoldos, Enikő; Walhovd, Kristine B, Poor Self-Reported Sleep Is Related to Regional Cortical Thinning in Aging but Not Memory Decline Results From the Lifebrain Consortium, Cerebral Cortex. http://doi.org/10.1093/cercor/bhaa332.
- 2020 Idland, Ane-Victoria; Sala-Llonch, Roser; Watne, Leiv Otto; Brækhus, Anne; Hansson, Oskar; Blennow, Kaj; Zetterberg, Henrik; Sørensen, Øystein; Walhovd, Kristine Beate; Wyller, Torgeir Bruun; Fjell, Anders Martin, Biomarker Profiling beyond Amyloid and Tau: Cerebrospinal Fluid Markers, Hippocampal Atrophy, and Memory Change in Cognitively Unimpaired Older Adults, Neurobiology of Aging. http://doi.org/10.1016/j.neurobiologing.2020.04.002.

- Fjell, Anders M.; Sørensen, Øystein; Amlien, Inge K.; Bartrés-Faz, David; Bros, Didac Maciá; Buchmann, Nikolaus; Demuth, Ilja; Drevon, Christian A.; Düzel, Sandra; Ebmeier, Klaus P.; Idland, Ane-Victoria; Kietzmann, Tim C.; Kievit, Rogier; Kühn, Simone; Lindenberger, Ulman; Mowinckel, Athanasia M.; Nyberg, Lars; Price, Darren; Sexton, Claire E.; Solé-Padullés, Cristina; Pudas, Sara; Sederevicius, Donatas; Suri, Sana; Wagner, Gerd; Watne, Leiv Otto; Westerhausen, René; Zsoldos, Enikő; Walhovd, Kristine B., Self-Reported Sleep Relates to Hippocampal Atrophy across the Adult Lifespan: Results from the Lifebrain Consortium, Sleep. http://doi.org/10.1093/sleep/zsz280.
- 2020 Gorbach, Tetiana; Pudas, Sara; Bartrés-Faz, David; Brandmaier, Andreas M.; Düzel, Sandra; Henson, Richard N.; Idland, Ane-Victoria; Lindenberger, Ulman; Bros, Didac Macià; Mowinckel, Athanasia M.; Solé-Padullés, Cristina; Sørensen, Øystein; Walhovd, Kristine B.; Watne, Leiv Otto; Westerhausen, René; Fjell, Anders M.; Nyberg, Lars, Longitudinal Association between Hippocampus Atrophy and Episodic-Memory Decline in Non-Demented APOE E4 Carriers, Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring. http://doi.org/10.1002/dad2.12110.
- Walhovd, Kristine B.; Fjell, Anders M.; Sørensen, Øystein; Mowinckel, Athanasia Monika; Reinbold, Céline Sonja; Idland, Ane-Victoria; Watne, Leiv Otto; Franke, Andre; Dobricic, Valerija; Kilpert, Fabian; Bertram, Lars; Wang, Yunpeng, Genetic Risk for Alzheimer Disease Predicts Hippocampal Volume through the Human Lifespan, Neurology Genetics. http://doi.org/10.1212/NXG.00000000000000506.
- 2019 Fjell, Anders M.; Sneve, Markus H.; Sederevicius, Donatas; Sørensen, Øystein; Krogsrud, Stine K.; Mowinckel, Athanasia M.; Walhovd, Kristine B., Volumetric and Microstructural Regional Changes of the Hippocampus Underlying Development of Recall Performance after Extended Retention Intervals, Developmental Cognitive Neuroscience. http://doi.org/10.1016/j.dcn.2019.100723.
- 2017 Asfaw, Derbachew; Vitelli, Valeria; Sørensen, Øystein; Arjas, Elja; Frigessi, Arnoldo, Time-Varying Rankings with the Bayesian Mallows Model, Stat. http://doi.org/10.1002/sta4.132.
- 2015 Wyller, Vegard Bruun; Sørensen, Øystein; Sulheim, Dag; Fagermoen, Even; Ueland, Thor; Mollnes, Tom Eirik, Plasma Cytokine Expression in Adolescent Chronic Fatigue Syndrome, Brain, Behavior, and Immunity. http://doi.org/10.1016/j.bbi.2014.12.025.

Asprusten, Tarjei Tørre; Fagermoen, Even; Sulheim, Dag; Skovlund, Eva; Sørensen, Øystein; Mollnes, Tom Eirik; Wyller, Vegard Bruun, Study Findings Challenge the Content Validity of the Canadian Consensus Criteria for Adolescent Chronic Fatigue Syndrome, Acta Paediatrica. http://doi.org/10.1111/apa.12950.

#### **Preprints**

2021 Sørensen, Øystein; Fjell, Anders M.; Walhovd, Kristine B., Longitudinal Modeling of Age-Dependent Latent Traits with Generalized Additive Latent and Mixed Models, arXiv:2105.02488 [stat].

#### Software

See my GitHub for a complete overview of my software both released and in development.

- 2021 cellmigRation: Track Cells, Analyze Cell Trajectories and Compute Migration Statistics, Ghannoum S, Fantini D, Leoncio W, and Sørensen Ø, https://bioconductor.org/packages/cellmigRation/.
  - o Contributor
- 2020 metagam: Meta-Analysis of Generalized Additive Models, Sørensen Ø., Brandmaier AM, and Mowinckel AM, https://cran.r-project.org/package=metagam.
  - o Author and maintainer
- 2020 BayesianLaterality: Predict Brain Asymmetry Based on Handedness and Dichotic Listening, Sørensen Ø., https://cran.r-project.org/package=BayesianLaterality.
  - o Author and maintainer
- 2018 hdme: High-Dimensional Regression with Measurement Error, Sørensen Ø, https://cran.r-project.org/package=hdme.
  - o Author and maintainer
- 2018 BayesMallows: Bayesian Preference Learning with the Mallows Rank Model, Sørensen Ø et al., https://cran.r-project.org/package=BayesMallows.
  o Author and maintainer

#### Teaching

- 2011-2014 **Teaching while doing PhD**, University of Oslo, Oslo, Norway.
  - o Statistics for medical students (MED1100)
  - o Introductory statistics for medical researchers (MF9130)
- 2008-2010 Teaching assistant, Norwegian University of Life Sciences, Ås, Norway.
  - o Waves, optics, theory of relativity and graviation (FYS113)
  - o Electromagnetism (FYS135)
  - o Quantum physics (FYS145)
  - o MATLAB for engineering students
  - o Linear algebra and linear differential equations (MATH113)
  - o Math preparation course for new students (MATH007)

### Courses and Workshops Organized

- 2021 A gentle introduction to Bayesian statistics, EPINOR Norwegian Research School in Epidemiology, Bergen, Norway.
  - o Full-day course in Bayesian statistics
  - $\circ$  Link to course material: https://osorensen.github.io/BayesCourseEPINOR2021/
- 2017 R courses, NextBridge Analytics, Oslo, Norway.
  - o Two-day open course in machine learning with R
  - o One-day and two-day courses in data science with R for large industry clients
- 2011 Statistics course, Nordland County, Bodø, Norway.
  - o Taught a one-day statistics course for upper secondary math teachers
- 2011 **Statistics course**, Tekna, Norwegian Society of Graduate Technical and Scientific Professionals, Ås, Norway.
  - o One-day exam preparation course for engineering students

#### Presentations at Peer-Reviewed International Conferences

- 2021 Generalized additive latent and mixed models, NORDSTAT2021, Tromsø, Norway (Online).
  - o Slides: https://osorensen.github.io/NORDSTAT2021/presentation.html
- 2021 Longitudinal modeling of age-dependent latent traits with generalized additive latent and mixed models, Nordic-Baltic Biometrics Conference, Helsinki, Finland (Online).
  - ${\tt o~Slides:~https://osorensen.github.io/NordicBalticBiometrics 2021/presentation.html}$
- 2020 Flexible Meta-Analysis of Generalized Additive Models with metagam, European R User Meeting, Milan, Italy (Online).
  - ${\tt o}$ Slides: https://osorensen.github.io/ERUM2020/metagam/metagam.html
- 2020 Analyzing Preference Data with the BayesMallows Package, European R User Meeting, Milan, Italy (Online).
  - o Slides: https://osorensen.github.io/ERUM2020/BayesMallows/presentation.html
- 2019 On Computing Age Trajectories of Brain Volumes Using Additive Mixed Models, Organization for Human Brain Mapping Annual Meeting, Rome, Italy.
  - o Poster presentation.
- 2014 Bayesian inference for the Mallows rank model, NORDSTAT2014, Turku, Finland.
  - o Contributed talk.
- 2013 Generalized Matrix Uncertainty Selector, Workshop on Statistical Methods for Post-Genomic Data, Amsterdam, Netherlands.
  - o Contributed talk.
- 2012 Variable Selection by Lasso in Regression with Measurement Error, Annual conference of the International Society for Clinical Biostatistics, Bergen, Norway.
  - o Contributed talk.

- 2012 Variable Selection by Lasso in Regression with Measurement Error, World Congress of Probability and Statistics, Istanbul, Turkey.

  o Contributed talk.
- 2012 Impact of Measurement Error in Lasso, NSF Workshop for High-Dimensional Data, Yale University, New Haven, United States.
   o Poster presentation.

#### Research Communication and Other Presentations

- 2021 Meta analysis of non-parametric models with {metagam}, Oslo userR! Group, Oslo, Norway.
  - ${\tt o}$ Slides: https://osorensen.github.io/oslo\_user\_metagam\_2021/metagam.html
- 2021 Get Your Results Faster With {future}, Oslo userR! Group, Oslo, Norway.
  o Recording: https://www.youtube.com/watch?v=dIjgVtuSOAc
- 2019 Spatiotemporal Modeling of Brain Changes Results from the Lifebrain Project, Annual meeting of the Oslo Centre for Biostatistics and Epidemiology, Vikersund, Norway.
  - $\circ$  Presentation of statistical methods in papers https://doi.org/10.1093/sleep/zsz280 and https://doi.org/10.1093/cercor/bhaa332
- 2019 Spatiotemporal Modeling of Brain Changes Predicted by Sleep Quality, University of Oslo seminar series in statistics and data science, Oslo, Norway.
  - o Presentation of statistical methods in papers https://doi.org/10.1093/sleep/zsz280 and https://doi.org/10.1093/cercor/bhaa332
- 2019 Mild introduction to Rcpp: what you need to know about C++ as R user, Oslo userR! Group, Oslo, Norway.
  - o Slides: https://osorensen.github.io/user-rcpp-2019/presentation.html
- 2017 Customer Lifetime Value, Annual meeting of the Norwegian Computer Society, section for Business Intelligence, Oslo, Norway.
  - o This presentation was awarded as the 'Best lightning talk'
- 2017 **Analyzing customer lifetime value**, Oslo data science meetup, Oslo, Norway.

  o 45-minute invited presentation
- 2017 Modeling of customer lifetime value, and how to use it, SAS User Forum, Oslo, Norway.
  - o 30-minute invited presentation
- 2012 **Penalized Regression with Measurement Error**, Seminar series in statistics, Department of Mathematics, University of Oslo, Oslo, Norway.

#### Service

# 14th International Conference of the ERCIM WG on Computational and Methodological Statistics 2021.

- o Organizer of session 'Statistical innovations in research on human brain and cognition' European R User Meeting 2020.
- o Assisting with Q&A in two parallel sessions

# Abel Symposium 2014 on Statistical analysis for high-dimensional data

o Member of Local Organizing Committee

#### Manuscript Reviews.

- o Cerebral Cortex
- o Entropy
- o IEEE Access
- o International Journal of Computer Mathematics
- o Journal of Machine Learning Research
- o Journal of the American Statistical Association
- o Journal of Open Source Software (4)
- o NeuroImage (2)
- o PLoS One
- o R Journal
- o Scientific Reports
- o Social Cognitive and Affective Neuroscience
- o Statistics in Medicine