Curriculum vitae with track record

Personal information

First name, Surname:	Kristian, Fossum		
Date of birth:	16.01.1987	Sex:	Male
Nationality:	Norwegian		
Researcher unique identifier(s) (ORCID, ResearcherID, etc.):	https://scholar.google.com/citations?user=CV_6EdIAAAAJ&hl=no https://www.researchgate.net/profile/Kristian-Fossum		
URL for personal website:			

Education

Year	Faculty/department - University/institution - Country
2015	Ph.D., Dept. of Mathematics, University of Bergen, Norway. **Defense: 13.02.2015**
2011	Ms.Sc. Petroleum Technology, University of Bergen.

Positions - current and previous

Year	Job title – Employer - Country
2022-	Senior Researcher, NORCE – Norwegian research centre, Norway
2019-2022	Researcher, NORCE – Norwegian research centre, Norway
2015-2019	Senior Researcher, Uni Research CIPR, Norway
2014-2015	Researcher, Uni Research CIPR, Norway

Project management experience

Year	Project owner - Project - Role - Funder
2022-	Project manager: “Multi-fidelity models, scenario evaluation and probabilistic forecasts for the digital subsurface”, one of four project under WP5 in RCN Petrosenter ”NCS2030 – National Centre for Sustainable Subsurface Utilization of the Norwegian Continental Shelf”.
2022	Project manager: NORCE internal project “PIPT”. 0.5 MNOK
2021-2022	Project manager: Work package manager: Research Council of Norway (RCN) Petromaks 2 project “Assimilating 4D Seismic Data: Big Data Into Big Models”. 47.4 MNOK

2019-2022	Work package manager: RCN Petromaks 2 project “Assimilating 4D Seismic Data: Big Data Into Big Models”. 47.4 MNOK
2021	Project manager: NORCE internal project “PIPT”. 1 MNOK

Supervision of students

Master's students	Ph.D. students	University/institution - Country
	1	Co-advisor. Dept. of Mathematics, University of Bergen, Norway (2019-)

Other relevant professional experiences

Year	Description - Role
2021-	Member of European Association of Geoscientists and Engineers (EAGE)

Track record

- Journal publications:
    1. Aanonsen, S. I., **Fossum, K**., & Mannseth, T. (2023). Bayesian model evaluation for multiple scenarios. *Computational Geosciences,* 27(6), 1001–1021. https://doi.org/10.1007/s10596-023-10241-2
    2. Stordal, A. S., Lorentzen, R. J., & **Fossum, K.** (2023). Marginalized iterative ensemble smoothers for data assimilation. *Computational Geosciences,* 27(6), 975–986. https://doi.org/10.1007/s10596-023-10242-1
    3. Nezhadali, M., Bhakta, T., **Fossum, K.**, & Mannseth, T. (2023). Sequential multilevel assimilation of inverted seismic data. *Computational Geosciences*, 27(2), 265–287. https://doi.org/10.1007/s10596-023-10191-9
    4. Jahani, N., Alyaev, S., Ambía, J., **Fossum, K.**, Suter, E., & Torres-Verdín, C. (2023). Enhancing the Detectability of Deep-Sensing Borehole Electromagnetic Instruments by Joint Inversion of Multiple Logs Within a Probabilistic Geosteering Workflow. *Petrophysics – The SPWLA Journal of Formation Evaluation and Reservoir Description*, 64(1), 80–91. https://doi.org/10.30632/PJV64N1-2023a6
    5. **Fossum, K**., Alyaev, S., Tveranger, J., & Elsheikh, A. H. (2022). Verification of a real-time ensemble-based method for updating earth model based on GAN. *Journal of Computational Science*, 65(October), 101876. https://doi.org/10.1016/j.jocs.2022.101876
    6. Jahani, N., Ambia Garrido, J., Alyaev, S., **Fossum, K.**, Suter, E., & Torres-Verdín, C. (2022). Ensemble-based well-log interpretation and uncertainty quantification for well geosteering. *GEOPHYSICS,* 87(3), IM57–IM66. https://doi.org/10.1190/geo2021-0151.1
    7. Nezhadali, M., Bhakta, T., **Fossum, K.**, & Mannseth, T. (2022). Iterative multilevel assimilation of inverted seismic data. *Computational Geosciences*, 26(2), 241–262. https://doi.org/10.1007/s10596-021-10125-3
    8. Oliver, D. S., **Fossum, K**., Bhakta, T., Sandø, I., Nævdal, G., & Lorentzen, R. J. (2021). 4D seismic history matching. *Journal of Petroleum Science and Engineering*, *207*, 109119. https://doi.org/10.1016/j.petrol.2021.109119
    9. Alyaev, S., Tveranger, J., **Fossum, K.**, & Elsheikh, A. H. (2021). Probabilistic forecasting for geosteering in fluvial successions using a generative adversarial network. *First Break*, *39*(7), 45–50. https://doi.org/10.3997/1365-2397.fb2021051

10. Nezhadali, M., Bhakta, T., **Fossum, K.**, & Mannseth, T. (2021). Multilevel Assimilation of Inverted Seismic Data With Correction for Multilevel Modeling Error. *Frontiers in Applied Mathematics and Statistics*, *7*(June), 1–17. https://doi.org/10.3389/fams.2021.673077
11. **Fossum, K.**, Mannseth, T., & Stordal, A. S. A. S. (2020). Assessment of multilevel ensemble-based data assimilation for reservoir history matching. *Computational Geosciences*, *24*(1), 217–239. https://doi.org/10.1007/s10596-019-09911-x
12. Alyaev, S., Suter, E., Bratvold, R. B., Hong, A., Luo, X., & **Fossum, K**. (2019). A decision support system for multi-target geosteering. *Journal of Petroleum Science and Engineering*, *183*(March), 106381. https://doi.org/10.1016/j.petrol.2019.106381
13. Mannseth, T., & **Fossum, K.** (2018). Assimilating spatially dense data for subsurface applications—balancing information and degrees of freedom. *Computational Geosciences*. https://doi.org/10.1007/s10596-018-9755-3
14. **Fossum, K**., & Mannseth, T. (2017). Coarse-scale data assimilation as a generic alternative to localization. *Computational Geosciences*, 21(1), 167–186. https://doi.org/10.1007/s10596-016-9602-3
15. **Fossum, K.**, & Mannseth, T. (2015). Assessment of ordered sequential data assimilation. *Computational Geosciences*, 19(4), 821–844. https://doi.org/10.1007/s10596-015-9492-9
16. **Fossum, K**., & Mannseth, T. (2014). Parameter sampling capabilities of sequential and simultaneous data assimilation: I. Analytical comparison. *Inverse Problems*, *30*(11), 114002. https://doi.org/10.1088/0266-5611/30/11/114002
17. **Fossum, K.**, & Mannseth, T. (2014). Parameter sampling capabilities of sequential and simultaneous data assimilation: II. Statistical analysis of numerical results. *Inverse Problems*, *30*(11), 114003. https://doi.org/10.1088/0266-5611/30/11/114003

- Conference preceedings:
    1. **Fossum, K.**, Alyaev, S., & Elsheikh, A. H. (2023). Ensemble History-Matching Workflow Using Interpretable Spade-Gan Geomodel. *Fifth EAGE Conference on Petroleum Geostatistics*, September 2019, 1–5. https://doi.org/10.3997/2214-4609.202335020
    2. Nezhadali, M., Bhakta, T., **Fossum, K.**, & Mannseth, T. (2022). Towards Application of Multilevel Data Assimilation in Realistic Reservoir History-Matching Problems. *ECMOR* 2022, September 2022, 1–12. https://doi.org/10.3997/2214-4609.202244029
    3. **Fossum, K.**, Alyaev, S., Suter, E., Tossi, G., & Mele, M. (2021). Reducing 3D uncertainty by an ensemble-based geosteering workflow: an example from the Goliat field. *3rd EAGE/SPE Geosteering Workshop,* November 2021, 1–5. https://doi.org/10.3997/2214-4609.2021624028
    4. Jahani, N., Ambia, J., **Fossum, K.**, Alyaev, S., Suter, E., & Torres-Verdin, C. (2021). Real-Time Ensemble-Based Well-Log Interpretation for Geosteering. *SPWLA Annual Logging Symposium*, D041S033R003.
    5. **Fossum, K.**, Alyaev, S., Tveranger, J., & Elsheikh, A. (2021). Deep learning for prediction of complex geology ahead of drilling. *Lecture Notes in Computer Science book series (LNCS, volume 12743)*. http://arxiv.org/abs/2104.02550
    6. Nezhadali, M., Bhakta, T., **Fossum, K.**, & Mannseth, T. (2020). A Novel Approach to Multilevel Data Assimilation. *ECMOR XVII,* September, 1–13. https://doi.org/10.3997/2214-4609.202035091
    7. **Fossum, K.**, & Lorentzen, R. J. (2019). Assisted History Matching of 4D Seismic Data-A Comparative Study. *Petroleum Geostatistics* 2019, 2019(1), 1–5.
    8. **Fossum, K.**, & Mannseth, T. (2018). A Novel Multilevel Method For Assimilating Spatially Dense Data. *ECMOR XVI - 16th European Conference on the Mathematics of Oil Recovery,* September 2018. https://doi.org/10.3997/2214-4609.201802144
    9. **Fossum, K.**, & Mannseth, T. (2016, August 29). Large-ensemble Data Assimilation Using an Upscaled Model. *15th European Conference on the Mathematics of Oil Recovery, ECMOR (XV)*. https://doi.org/10.3997/2214-4609.201601818

10. **Fossum, K.**, & Mannseth, T. (2014). Evaluation of Ordered Sequential Assimilation for Improved EnKF Sampling. *14th European Conference on the Mathematics of Oil Recovery (ECMOR XIV),* September 2014, 8–11. https://doi.org/10.3997/2214-4609.20141790
11. **Fossum, K.**, Mannseth, T., Oliver, D. S., & Skaug, H. J. (2012). Numerical Comparison of Ensemble Kalman Filter and Randomized Maximum Likelihood. *13th European Conference on the Mathematics of Oil Recovery (ECMOR XIII).*

- Main developer of the Python-Ensemble-Toolbox (PET), the NORCE open-source code for ensemble-based optimization and data assimilation. Available on https://github.com/Python-Ensemble-Toolbox/
- PhD dissertation
    1. **Fossum, K.** (2015). Assessment of Sequential and Simultaneous Ensemble-based History Matching Methods for Weakly Non-linear Problems. University of Bergen.