Peder A. Olsen
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Mathematician
Space Farmer
Machine Learner
AI Aficionado

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EDUCATION

University of Michigan — Jan. 1992 - May 1996
Ph.D., Mathematics, **Negative Eigenvalues of the Schrödinger Equation: an Approach through Fractional Integration and Morrey Spaces,** GPA 8.13 (9=A+, 8=A, …).

NTNU
Norwegian University of Science and Technology

Norwegian Institute of Technology — Aug. 1986 - Dec. 1990
Sivilingeniør, (M.S., Engineering), Mathematics, GPA 1.5 (1.0=A+, 1.5=A, …).

EMPLOYMENT

Research For Industries, Azure Global Research — Jun. 2019 - Oct. 2024
Principal Research Scientist

IBM, Thomas J. Watson Research Center — May 1996 - May 2019
Principal Research Staff Member, Research Staff Member and postdoc.

Norwegian Defense Research Establishment — Mar. - Dec. 1991
Norwegian military service. Computational and mathematical modeling of naval attack scenarios.

AWARDS

1. *Research Division Award – Multi-talker ASR*, Issued by John Kelly III, Senior Vice President, Research, IBM, Oct. 2010.

2. *Outstanding Teamwork and Extraordinary Effort toward Closing a Significant Speech Deal for IBM,* Issued by Charles Lickel, Vice President, Software, IBM, March 2009. For help with closing a speech contract with Nuance.

3. *Research Division Award – Contributions to Embedded ViaVoice Speech Recognition Engine*, Issued by Paul M. Horn, Senior Vice President, Research, IBM, January 2005. For dramatic reductions in word error rate and for generating product level acoustic models for US English for embedded ViaVoice product line.

4. *Outstanding Technical Achievement Award in Appreciation for: Technical Contributions to Embedded Via Voice,* Issued by Chairman and Chief Executive Officer Samuel Palmisano, IBM, Jul. 2003. For deployment of speech recognition engine in the 2003 and 2004 Honda Accord models.

5. *Outstanding Technical Achievement Award in Appreciation for: Broadcast News Transcription Technologies,* issued by Louis V. Gerstner Chairman and Chief Executive Officer, IBM, Jul. 1999.

6. *Chemistry and Mathematics Award*, "Dragseth's fond", Tønsberg Gymnas (high school), Tønsberg, Norway, Jun. 1986.

7. 8th place, The Niels Henrik Abel Competition, Oslo, Norway, Apr. 1986.

PUBLICATIONS

The total number of citations for my articles is greater than 5300 as calculated by Google Scholar (the most recent number can be found here). My Google H-index is 33 and the Erdös number is 3. The Olsen inequality is named after my thesis work.

RECENT ARTICLES

[1] Arif Masrur, Peder Olsen, Paul Adler, Carlan Jackson, Matthew Myers, Nathan Sedghi and Ray R Weil, Learning to see more: UAS-guided super-resolution of satellite imagery for precision agriculture. *arXiv preprint*, **arXiv:2505.21746**, 2025.

[2] Kuntai Du, Yihua Chen, Peder Olsen, Shadi Noghabi and Jungchen Jiang, Earth+: On-board satellite imagery compression leveraging historical earth observations. *ASPLOS 2025* , **30**, p. 361–276, March 2025.

[3] Angela Busheska, Vikram Iyer, Bruno Silva, Peder Olsen, Ranveer Chandra and Vaishnavi Ranganathan, TerraTrace: Spatio-temporal vegetation signatures for land use analytics. *International Workshop on Mobile Computing Systems and Applications*, **26**, p. 123-123, 2025.

[4] Ishita Bansal Peder Olsen, and Roberto Estevão. Remote sensing for weed detection and control. *arXiv preprint*, **arXiv:2410.22554**, 2024.

[5] Margaret Capetz, Swati Sharma, Rafael Padilha, Peder Olsen, Jessica Wolk, Emre Kiciman and Ranveer Chandra, Enabling adoption of regenerative agriculture through soil carbon copilots. *arXiv preprint*, **arXiv:2411.16872**, November 2024.

[6] Kiran Mantripragada, Paul R. Adler, Peder A. Olsen, Faisal Z. Qureshi, An iterative method for hyperspectral pixel unmixing leveraging latent Dirichlet variational autoencoder. *IGARSS 2023*, p. 7527–7530, 2023.

[7] Olaoluwa Adigun, Peder A Olsen and Ranveer Chandra, Location aware super-resolution for satellite data fusion. *IGARSS 2022*, July 2022.

[8] Min-hwan Oh, Peder Olsen and Karthikeyan Natesan Ramamurthy, Crowd counting with decomposed uncertainty. *AAAI 2020*, **34**, p. 11799–11806, 2020.

[9] Min-hwan Oh, Peder Olsen, Karthikeyan Natesan Ramamurthy, Counting and segmenting sorghum heads. *arXiv preprint*, **arXiv:1905.13291**, 2019.

[10] Jialei Wang, Peder Olsen, Andrew R Conn, Aurélie C Lozano, Removing clouds and recovering ground observations in satellite image sequences via temporally contiguous robust matrix completion. *CVPR 2016*, p. 2754–2763, 2016.

SELECTED ARTICLES

[11] Mingmin Zhao, Peder A. Olsen and Ranveer Chandra, Seeing through clouds in satellite images. *IEEE Transactions on Geoscience and Remote Sensing*, **61** p. 1-16, 2023.

[12] Cho-Jui Hsieh and Peder Olsen Nuclear norm minimization via active subspace selection *ICML 2014,* Beijing, China, June 2014.

[13] Peder A. Olsen, Ramesh Natarajan and Sholom M. Weiss Graphical models for identifying fraud and waste in healthcare claims *SIAM Data Mining Conference 2014,* Philadelphia, PA, April 2014.

[14] Peder A. Olsen, Steven J. Rennie and Vaibhava Goel **Efficient automatic differentiation of matrix functions** *Recent Advances in Algorithmic Differentiation,* p. 71-81, Springer Berlin Heidelberg, 2012.

[15] Peder A. Olsen, Figen Oztoprak, Jorge Nocedal and Steven J. Rennie Newton-like methods for sparse inverse covariance estimation, *NIPS 2012,* Lake Tahoe, Nevada, December 3-7, 2012.

[16] Peder A. Olsen, John Hershey, Steven Rennie and Vaibhava Goel, **A speech recognition solution to an ancient cryptography problem.** *IBM Technical Report RC25109,* New York, USA, 2011.

[17] Steven J. Rennie, John R. Hershey and Peder A. Olsen. Single-channel multitalker speech recognition. *Signal Processing Magazine*, **27**, p. 66-80, November 2010. Special issue: Graphical Modeling.

[18] John Hershey and Peder Olsen, **Approximating the Kullback Leibler divergence between gaussian mixture models.** *ICASSP 2007,* **IV**, p. 317-320, April 15-20, 2007, Honolulu, Hawaii.

[19] Peder Olsen and Ramesh Gopinath. Modeling inverse covariance matrices by basis expansion. *Transactions in Speech and Audio Processing*, **12** (1):37-46, January 2004.

[20] Peder Olsen. Fractional integration, Morrey spaces and a Schrödinger equation. *Communications in Partial Differential Equations*, **20**(11/12):2004–2057, 1995.