

EVRIM ACAR (ATAMAN)

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Digital Engineering
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Research Interests

- Data mining, mathematical modeling, matrix/tensor factorizations.
- Applications of matrix/tensor factorizations in chemometrics, metabolomics, computational neuroscience and social network analysis.

Education

- Ph.D., Computer Science, Rensselaer Polytechnic Institute, Troy, New York, May 2008.
Dissertation: *Understanding Epilepsy Seizure Structure Using Tensor Analysis*.
- M.S., Computer Science, Rensselaer Polytechnic Institute, Troy, New York, December 2006.
Dissertation: *Chatroom Communication Analysis Using Tensor Decompositions*.
- B.S., Computer Engineering, Bogazici University, Istanbul, Turkey, July 2003.

Professional Experience

- Chief Research Scientist (January 2019 - ...), [Simula Metropolitan Center for Digital Engineering](#), Oslo, Norway.
- Senior Research Scientist (January - December 2018), [Simula Metropolitan Center for Digital Engineering](#), Oslo, Norway.
- Assistant Professor (March 2012 - 2017), [Chemometrics and Analytical Technology](#), Faculty of Science, University of Copenhagen, Denmark.
 - Instructor (September - December 2017), [Computer Engineering Department](#), Bogazici University, Istanbul, Turkey.
 - Visiting Scholar (April - June 2013), [Institute for Computational and Mathematical Engineering \(ICME\)](#), Stanford University, California.
- Postdoctoral Researcher (March 2011 - February 2012), [Spectroscopy and Chemometrics](#), Faculty of Science, University of Copenhagen, Denmark.
- Senior Research Scientist (April 2010 - February 2011), [National Research Institute of Electronics and Cryptology \(TUBITAK-BILGEM\)](#), Gebze, Turkey.
- Postdoctoral Researcher (June 2008 - November 2009), Computational Sciences and Mathematics Research Department, [Sandia National Laboratories](#), Livermore, California.
- Research/Teaching Assistant (August 2003 - May 2008), [Computer Science Department](#), Rensselaer Polytechnic Institute (RPI), Troy, New York.
 - Visiting Researcher (Summers 2006 & 2007), [Spectroscopy and Chemometrics](#), Faculty of Science, University of Copenhagen, Denmark.

Honors and Awards

- The Danish Council for Independent Research Sapere Aude Young Elite Researcher, 2012.
- Travel Award (EU FP6) to attend ISMB/ECCB, Vienna, Austria, 2007.
- Travel Award (SIAM) to attend ICIAM, Zurich, Switzerland, 2007.
- Participant/Travel Grant (NSF) to attend IPAM Graduate Summer School on Intelligent Extraction of Information from Graphs and High Dimensional Data, UCLA, CA, 2005.
- High-Honor Student, Computer Engineering Department, Bogazici University, Istanbul, Turkey, 2003.
- High-Honor Award, Ranked 2, Class of 1998, TED Ankara College, Ankara, Turkey, 1998.
- Three-year Scholarship, Ranked 1, Class of 1995, TED Ankara College, Ankara, Turkey, 1995.

Research Grants

- **Joint Data Analysis for Enhanced Knowledge Discovery in Metabolomics**, The Danish Council for Independent Research - Technology and Production Sciences, March 1, 2012 - December 31, 2016 (kr 4,426,322).

Refereed Journal Articles

23. **E. Acar**, G. Gürdeniz, B. Khakimov, F. Savorani, S. K. Korndal, T. M. Larsen, S. B. Engelsen, A. Astrup, L. O. Dragsted. *Biomarkers of individual foods, and separation of diets using untargeted LC-MS based plasma metabolomics in a randomized controlled trial*. Molecular Nutrition and Food Research, 63: 1800215, 2019.
22. U. Wünsch, **E. Acar**, B. P. Koch, K. R. Murphy, P. Schmitt-Kopplin, C. A. Stedmon. *The molecular fingerprint of fluorescent natural organic matter offers insight into its diagenetic state*. Analytical Chemistry, 90(24): 14188-14197, 2018.
21. **E. Acar**, G. Gürdeniz, F. Savorani, L. Hansen, A. Olsen, A. Tjønneland, L. O. Dragsted and R. Bro. *Forecasting Chronic Diseases using Data Fusion*. Journal of Proteome Research, 16(7):2435-2444, 2017.
20. A. K. Smilde, I. Mage, T. Næs, T. Hankemeier, M. A. Lips, H. A. L. Kiers, **E. Acar** and R. Bro. *Common and Distinct Components in Data Fusion*. Journal of Chemometrics, 31:e2900, 2017.
19. B. Khakimov, S. K. Poulsen, F. Savorani, **E. Acar**, G. Gürdeniz, T. M. Larsen, A. Astrup, L. O. Dragsted and S. B. Engelsen. *New Nordic diet versus average Danish diet: a randomized controlled trial revealed healthy long-term effects of the new Nordic diet by GC-MS blood plasma metabolomics*. Journal of Proteome Research, 15(6):1939-1954, 2016.
18. **E. Acar**, R. Bro and A. K. Smilde. *Data Fusion in Metabolomics using Coupled Matrix and Tensor Factorizations*. Proceedings of the IEEE, 103:1602-1620, 2015.
17. J. Escudero, **E. Acar**, A. Fernández and R. Bro. *Multiscale Entropy Analysis of Resting-State Magnetoencephalogram with Tensor Factorisations in Alzheimer's Disease*. Brain Research Bulletin, 119:136-144, 2015.
16. B. Ermiş, **E. Acar** and A. T. Cemgil. *Link Prediction in Heterogeneous Data via Generalized Coupled Tensor Factorization*. Data Mining and Knowledge Discovery, 29:203-236, 2015.
15. **E. Acar**, E. E. Papalexakis, G. Gürdeniz, M. A. Rasmussen, A. J. Lawaetz, M. Nilsson and R. Bro. *Structure-Revealing Data Fusion*. BMC Bioinformatics, 15:239, 2014.
14. **E. Acar**, M. A. Rasmussen, F. Savorani, T. Næs and R. Bro. *Understanding Data Fusion within the Framework of Coupled Matrix and Tensor Factorizations*. Chemometrics and Intelligent Laboratory Systems, 129:53-63, 2013.
13. G. Gürdeniz, L. Hansen, M. A. Rasmussen, **E. Acar**, A. Olsen, J. Christensen, T. Barri, A. Tjønneland and L. O. Dragsted. *Patterns of Time Since Last Meal Revealed by Sparse PCA in an Observational LC-MS based Metabolomics Study*. Metabolomics, 9:1073-1081, 2013.
12. **E. Acar**, G. Gürdeniz, M. A. Rasmussen, D. Rago, L. O. Dragsted and R. Bro. *Coupled Matrix Factorization with Sparse Factors to Identify Potential Biomarkers in Metabolomics*. International Journal of Knowledge Discovery in Bioinformatics, 3:22-43, 2012.
11. R. Bro, E. E. Papalexakis, **E. Acar** and N. D. Sidiropoulos. *Coclustering - a Useful Tool for Chemometrics*. Journal of Chemometrics, 26:256-263, 2012.

10. **E. Acar**, G. E. Plopper and B. Yener. *Coupled Analysis of in Vitro and Histology Tissue Samples to Quantify Structure-Function Relationship*. PLoS One, 7(3):e32227, 2012.
9. **E. Acar**, D. M. Dunlavy, T. G. Kolda and M. Mørup. *Scalable Tensor Factorizations for Incomplete Data*. Chemometrics and Intelligent Laboratory Systems, 106:41-56, 2011.
8. D. M. Dunlavy, T. G. Kolda and **E. Acar**. *Temporal Link Prediction Using Matrix and Tensor Factorizations*. ACM Transactions on Knowledge Discovery from Data, 5(2), Article 10, 2011.
7. **E. Acar**, D. M. Dunlavy and T. G. Kolda. *A Scalable Optimization Approach for Fitting Canonical Tensor Decompositions*. Journal of Chemometrics, 25:67-86, 2011.
6. **E. Acar** and B. Yener. *Unsupervised Multiway Data Analysis: A Literature Survey*. IEEE Transactions on Knowledge and Data Engineering, 21:6-20, 2009.
5. R. Bro, **E. Acar** and T. G. Kolda. *Resolving the Sign Ambiguity in the Singular Value Decomposition*. Journal of Chemometrics, 22:135-140, 2008.
4. **E. Acar**, R. Bro and B. Schmidt. *New Exploratory Clustering Tool*. Journal of Chemometrics, 22:91-100, 2008.
3. B. Yener, **E. Acar**, P. Aguis, K. P. Bennett, S. L. Vandenberg and G. E. Plopper. *Multiway Modeling and Analysis in Stem Cell Systems Biology*. BMC Systems Biology, 2:63, 2008.
2. K. P. Bennett, C. Bergeron, **E. Acar**, R. F. Klees, S. L. Vandenberg, B. Yener and G. E. Plopper. *Proteomics Reveals Multiple Routes to the Osteogenic Phenotype in Mesenchymal Stem Cells*. BMC Genomics, 8:380, 2007.
1. **E. Acar**, C. A. Bingöl, H. Bingöl, R. Bro and B. Yener. *Multiway Analysis of Epilepsy Tensors*. Bioinformatics, 23(13): i10-i18, 2007.

Refereed Conference/Workshop Articles

16. **E. Acar**, Y. Levin-Schwartz, V. D. Calhoun and T. Adali. *ACMTF for Fusion of Multi-Modal Neuroimaging Data and Identification of Biomarkers*. In EUSIPCO 2017: Proceedings of the 25th European Signal Processing Conference, 2017.
15. **E. Acar**, Y. Levin-Schwartz, V. D. Calhoun and T. Adali. *Tensor-Based Fusion of EEG and fMRI to Understand Neurological Changes in Schizophrenia*. In IEEE ISCAS 2017: Proceedings of the 50th Annual International Symposium on Circuits and Systems, pp. 314-317, 2017.
14. **E. Acar**, M. Nilsson and M. Saunders. *A Flexible Modeling Framework for Coupled Matrix and Tensor Factorizations*. In EUSIPCO 2014: Proceedings of the 22nd European Signal Processing Conference, pp. 111-115, 2014.
13. W. Swinnen, B. Hunyadi, **E. Acar**, S. Van Huffel and M. De Vos. *Incorporating Higher Dimensionality in Joint Decomposition of EEG and fMRI*. In EUSIPCO 2014: Proceedings of the 22nd European Signal Processing Conference, pp. 121-125, 2014.
12. U. Şimşekli, B. Ermiş, A. T. Cemgil and **E. Acar**. *Optimal Weight Learning For Coupled Tensor Factorization with Mixed Divergences*. In EUSIPCO 2013: Proceedings of the 21st European Signal Processing Conference, pp. 1-5, 2013.
11. **E. Acar**, A. J. Lawaetz, M. A. Rasmussen and R. Bro. *Structure-Revealing Data Fusion Model with Applications in Metabolomics*. In IEEE EMBS 2013: Proceedings of the 35th International Conference of IEEE Engineering in Medicine and Biology Society, pp. 6023-6026, 2013.

10. **E. Acar**, G. Lozanski and M. N. Gürcan. *Tensor-based Computation and Modeling in Multi-Resolution Digital Pathology Imaging: Application to Follicular Lymphoma Grading*. In Proceedings of SPIE 8676, Medical Imaging 2013: Digital Pathology, 867603, 2013.
9. **E. Acar**, G. Gürdeniz, M. A. Rasmussen, D. Rago, L. O. Dragsted and R. Bro. *Coupled Matrix Factorization with Sparse Factors to Identify Potential Biomarkers in Metabolomics*. In ICDM 2012 Workshop Proceedings for the 3rd Workshop on Biological Data Mining and Its Applications in Healthcare, pp. 1-8, 2012.
8. B. Ermiş, **E. Acar** and A. T. Cemgil. *Link Prediction via Generalized Coupled Tensor Factorisation*. ECML/PKDD Workshop on Collective Learning and Inference on Structured Data, 2012.
7. **E. Acar**, T. G. Kolda and D. M. Dunlavy. *All-at-once Optimization for Coupled Matrix and Tensor Factorizations*. KDD Workshop on Mining and Learning with Graphs, 2011.
6. **E. Acar**, D. M. Dunlavy, T. G. Kolda and M. Mørup. *Scalable Tensor Factorizations with Missing Data*. In SDM 2010: Proceedings of the 10th SIAM International Conference on Data Mining, pp. 701-712, 2010.
5. **E. Acar**, D. M. Dunlavy and T. G. Kolda. *Link Prediction on Evolving Data using Matrix and Tensor Factorizations*. In ICDM 2009 Workshop Proceedings for the 1st Workshop on Large-Scale Data Mining: Theory and Applications, pp. 262-269, 2009.
4. **E. Acar**, C. A. Bingöl, H. Bingöl, R. Bro and B. Yener. *Seizure Recognition on Epilepsy Feature Tensor*. In IEEE EMBS 2007: Proceedings of the 29th International Conference of IEEE Engineering in Medicine and Biology Society, pp. 4273-4276, 2007.
3. **E. Acar**, C. A. Bingöl, H. Bingöl and B. Yener. *Computational Analysis of Epileptic Focus Localization*. In BIOMED 2006: Proceedings of the 24th IASTED International Conference on Biomedical Engineering, pp. 317-322, 2006.
2. **E. Acar**, S. A. Çamtepe and B. Yener. *Collective Sampling and Analysis of High-order Tensors for Chatroom Communications*. In ISI 2006: Proceedings of IEEE International Conference on Intelligence and Security Informatics, pp. 213-224, 2006.
1. **E. Acar**, S. A. Çamtepe, M. S. Krishnamoorthy and B. Yener *Modeling and Multiway Analysis of Chatroom Tensors*. In ISI 2005: Proceedings of IEEE International Conference on Intelligence and Security Informatics, pp. 256-268, 2005.

Conference, Workshop & Seminar Presentations

- Invited Speaker, [5th Conference on Constraint-Based Reconstruction and Analysis \(COBRA 2018\)](#), Seattle, WA, Oct 14-16, 2018.
- Invited Tutorial, [14th International Conference on Latent Variable Analysis and Signal Separation](#), University of Surrey, Guildford, UK, July 2-6, 2018.
- Three-way Methods in Chemistry and Psychology, Angel Fire, NM, June 11-15, 2018.
- Invited Seminar, University of Granada, Granada, Spain, February 22-23, 2018.
- Seminar, [Simula Research Laboratory](#), Fornebu, Norway, September 15, 2017.
- Refereed Paper, EUSIPCO, Kos, Greece, August 28 - September 1, 2017.
- Seminar, [Sandia National Labs](#), Livermore, CA, April 24, 2017.
- Seminar, [IBM Research](#), Zurich, Switzerland, March 13, 2017.
- Seminar, [Steno Diabetes Center](#), Copenhagen, Denmark, October 5, 2016.
- Invited Talk, [13th NuGOweek: Phenotypes and Prevention - The Interplay of Genes, Life-style factors and Gut Environment](#), Copenhagen, Denmark, September 5-8, 2016.

- Invited Minisymp. Talk, [20th Conf. of the International Linear Algebra Society](#), Leuven, Belgium, July 11-15, 2016.
- Invited Minisymp. Talk, [SIAM Conf. Parallel Processing for Scientific Computing](#), Paris, France, April 12-15, 2016.
- Organizer/Speaker, [Dagstuhl Perspectives Workshop: Tensor Computing for Internet of Things](#), Schloss Dagstuhl, Germany, April 10-13, 2016.
- Invited Talk, Metabolomics Young Investigators Network Meeting, Denmark, March 30, 2016.
- Invited Seminar, The University of Edinburgh, UK, March 17, 2016.
- [Workshop on Tensor Decompositions and Applications](#), Leuven, Belgium, January 18-22, 2016.
- Seminar, Ozyegin University, Istanbul, Turkey, December 29, 2015.
- Mini-Arctic Workshop, Nofima, Ås, Norway, November 5-6, 2015.
- Seminar, Yeditepe University, Istanbul, Turkey, September 8, 2015.
- Seminar, Bogazici University, Istanbul, Turkey, August 20, 2015.
- Refereed Paper, EUSIPCO, Lisbon, Portugal, September 1-5, 2014.
- Invited Minisymp. Talk, COMPSTAT, Geneva, Switzerland, August 19-22, 2014.
- Invited Seminar, KU Leuven, Belgium, June 2, 2014.
- [Arctic Analysis](#), Ilulissat, Greenland, March 10-14, 2014.
- Invited Minisymp. Talk, [ERCIM](#), University of London, UK, December 14-16, 2013.
- Invited Seminar, GIPSA-LAB, Grenoble, France, November 8, 2013.
- Invited Seminar, Xerox Research Centre Europe, Grenoble, France, November 7, 2013.
- Seminar, Kadir Has University, Istanbul, Turkey, October 23, 2013.
- Invited Speaker, [Biomedical Eng. Society Annual Meeting](#), Seattle, WA, September 25-28, 2013.
- Refereed Paper, [IEEE Eng. in Medicine and Biology Society](#), Osaka, Japan, July 3-7, 2013.
- Seminar, Stanford University, CA, June 3, 2013.
- Minisymp. Organizer/Speaker, [SIAM Conf. Computational Science and Eng.](#), Boston, MA, February 28, 2013.
- Refereed Paper, SPIE Medical Imaging Conference, Orlando, FL, February 10, 2013.
- Invited Seminar, KU Leuven, Belgium, December 14, 2012.
- Refereed Paper, ICDM Workshop: Biological Data Mining, Brussels, Belgium, December 10, 2012.
- Invited Minisymp. Talk, [SIAM Conf. Applied Linear Algebra](#), Valencia, Spain, June 18-22, 2012.
- [Three-way Methods in Chemistry and Psychology](#), Bruges, Belgium, June 2-7, 2012.
- Seminar, Stanford University, CA, May 10, 2012.
- Seminar, Sandia National Labs, Livermore, CA, May 7, 2012.
- Invited Speaker, [RPI-NSF Workshop on Multiscale Modeling of Complex Data](#), Troy, NY, September 12-14, 2011.
- Invited Speaker, Workshop on Tensor Approximation in High Dimension, Hausdorff Center for Mathematics, Bonn, Germany, August 1-5, 2011.
- Seminar, Bogazici University, Istanbul, Turkey, March 11, 2011.
- Seminar, Ozyegin University, Istanbul, Turkey, October 27, 2010.
- [Workshop on Tensor Decompositions and Applications](#), Bari, Italy, September 13-17, 2010.
- Invited Minisymp. Talk, BIT50 Trends in Numerical Computing, Lund, Sweden, June 17-20, 2010.
- Seminar, TUBITAK-UEKAE, January 11, 2010.
- Invited Minisymp. Talk, [SIAM Conf. Applied Linear Algebra](#), Monterey, CA, October 26-29, 2009.
- Minisymp. Organizer/Speaker, [SIAM Annual Meeting](#), Denver, Colorado, July 6-10, 2009.
- Three-way Methods in Chemistry and Psychology, Vall de Núria, Spain, June 14-19, 2009.
- Invited Seminar, Stanford University, CA, May 27, 2009.
- Minisymp. Organizer/Speaker, [SIAM Conf. Computational Science and Eng.](#), Miami, FL, March 2-6, 2009.
- Invited Speaker, [Future Directions in Tensor-Based Computation](#), NSF, Arlington, VA, February

20-21, 2009.

- [KDD Workshop: Data Mining using Matrices and Tensors](#), Las Vegas, NV, August 24, 2008.
- Invited Minisymp. Talk, [SIAM Annual Meeting](#), San Diego, CA, July 7-11, 2008.
- Seminar, Sandia National Labs, Livermore, CA, December 17, 2007.
- Refereed Paper, [IEEE Eng. in Medicine and Biology Society](#), Lyon, France, August 23-26, 2007.
- Refereed Paper, [ISMB/ECCB](#), Vienna, Austria, July 21-25, 2007.
- Invited Minisymp. Talk, Int. Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007.
- Refereed Paper, IASTED Int. Conf. Biomedical Eng., Innsbruck, Austria, February 17, 2006.
- Refereed Paper, IEEE Int. Conf. Intelligence and Security Informatics, Atlanta, Georgia, May 19-20, 2005.

Software

- [Poblano Toolbox](#) (MATLAB) - Large-scale algorithms for nonlinear optimization.
- [CMTF Toolbox](#) (MATLAB) - Coupled matrix/tensor factorization models for data fusion.

Teaching

- Bogazici University (Istanbul, Turkey)
 - Instructor, Numerical Linear Algebra and Its Applications, Fall 2017.
- University of Copenhagen (Copenhagen, Denmark)
 - Instructor, Data Fusion, Copenhagen School of Chemometrics, May 25-26, 2016.
 - Instructor, Data Fusion, ODIN course, November 25, 2015.
 - Instructor, Advanced MATLAB for multivariate data analysis, August 2012.
 - Instructor, Introduction to MATLAB for multivariate data analysis, May 2011.
- Rensselaer Polytechnic Institute (Troy, NY)
 - Teaching Assistant: Introduction to Programming in VB using .NET, Fall 2006.
 - Teaching Assistant: Introduction to Programming in C++ using .NET, Spring 2004.
 - Teaching Assistant: Database Systems, Fall 2003 & Fall 2004.

Professional Service and Committee Work

- Editorial Work:
 - Guest Editor, [Special Section on CSE Software and Big Data in CSE, SIAM Journal on Scientific Computing \(SISC\)](#), 2015.
- Conference, Workshop & Minisymposium Organization:
 - Organizing Committee: [Low-rank Optimization and Applications](#), Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany, April 1-5, 2019.
 - Organizing Committee: [Dagstuhl Perspective Workshop: Tensor Computing for Internet of Things](#), Schloss Dagstuhl, Germany, April 10-13, 2016.
 - Organizing Committee: [SIAM Conference on Computational Science and Engineering](#), Salt Lake City, UT, March 14-18, 2015.
 - Minisymposium Co-organizer, [SIAM Conference on Computational Science and Engineering](#), Boston, MA, February 25-March 1, 2013.
 - Minisymposium Co-organizer, [SIAM Annual Meeting](#), Denver, CO, July 6-10, 2009.
 - Minisymposium Co-organizer, [SIAM Conference on Computational Science and Engineering](#), Miami, FL, March 2-6, 2009.
- Program Committee Member:
 - ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, 2018.
 - European Signal Processing Conference (EUSIPCO), 2017 & 2018.
 - ASE International Conference on Big Data Science and Computing, 2014.
 - SIAM International Conference on Data Mining, 2013 & 2014.
 - ASE/IEEE International Conference on Big Data, 2013.
 - [ECML/PKDD Workshop on Tensor Methods for Machine Learning](#), 2013.
 - [21st ACM International Conference on Information and Knowledge Management](#), 2012.
- Thesis Committee Member:
 - Borbala Hunyadi, KU Leuven, 2014 (Ph.D.)
“Learning from structured EEG and fMRI data supporting the diagnosis of epilepsy”
 - Yusuf Kenan Yilmaz, Bogazici University, 2012 (Ph.D.)
“Generalized Tensor Factorization”
 - Beyza Ermiş, Bogazici University, 2012 (M.S.)
“Probabilistic Tensor Factorization for Link Prediction”
- Reviewer for: *Machine Learning, Data Mining and Knowledge Discovery, SIAM J. Matrix Analysis and Applications, Linear Algebra and its Applications, Numerical Linear Algebra with Applications, Information Sciences, ACM Transactions on Knowledge Discovery from Data, ACM Transactions on Information Systems, IEEE Transactions on Knowledge and Data Engineering, Neural Processing Letters, Sensors, IEEE Transactions on Cybernetics, IEEE Transactions on Image Processing, Chemometrics and Intelligent Laboratory Systems, Proceedings of the IEEE, IEEE Transactions on Biomedical Engineering, Neurocomputing, Journal of Neuroscience Methods, International Journal of Neural Systems, Journal of Chemometrics, Neural Computation, Journal of Machine Learning Research.*