

## Eric M. Evert

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CONTACT INFORMATION	Mudd Hall, 2233 Tech Drive Evanston, IL 60208	eric.evert@northwestern.edu <a href="http://ericevert.com">http://ericevert.com</a> +1-864-385-5013
RESEARCH INTERESTS	Functional Analysis, Matrix Convex Sets, Extreme Points, Free Spectrahedra, Noncommutative Polynomials, Tensors, Multilinear Algebra, Low Rank Approximation	
EDUCATION	<b>University of California, San Diego</b> , La Jolla, CA  Ph.D., Mathematics, September 2018 Dissertation Topic: <i>Extreme Points of Matrix Convex Sets</i> Advisor: J. William Helton, Ph.D  <b>Virginia Tech</b> , Blacksburg, VA  B.S., Mathematics, May 2013 <i>Summa Cum Laude</i> <i>Honors Scholar</i>  Honors Societies  Phi Beta Kappa Pi Mu Epsilon	
RESEARCH EXPERIENCE	<b>Shaw Family CS+X Postdoctoral Fellow</b> Department of Computer Science, Northwestern University Supervisor: Aravindan Vijayaraghavan, Ph.D	September 2022 to Present
	<b>Postdoctoral Researcher</b> Group Science, Engineering and Technology, KU Leuven, Kulak Supervisor: Lieven De Lathauwer, Ph.D	August 2018 to August 2022
	<b>Research Assistant</b> Department of Mathematics, UC San Diego Supervisor: J. William Helton, Ph.D	June 2013 to August 2018
	<b>REU</b> Department of Mathematics, Central Michigan University Supervisor: Sivaram K. Narayan, Ph.D	Summer 2012
REFEREED JOURNAL PUBLICATIONS	<ol style="list-style-type: none"><li>1. <b>E. Evert</b>, L. De Lathauwer: <i>On best low rank approximation of positive definite tensors</i>, SIAM J. Matrix Anal. &amp; Appl. <b>44</b> (2023) 867–893 <a href="https://doi.org/10.1137/22M1494178">https://doi.org/10.1137/22M1494178</a></li><li>2. <b>E. Evert</b>, S. McCullough, T. Štrekelj, A. Vershynina: <i>Convexity of a certain operator trace functional</i>, Linear Algebra Appl. <b>643</b> (2022) 218–234. <a href="https://doi.org/10.1016/j.laa.2022.02.033">https://doi.org/10.1016/j.laa.2022.02.033</a></li><li>3. <b>E. Evert</b>, M. Vandecappelle, L. De Lathauwer: <i>Canonical polyadic decomposition via the generalized Schur decomposition</i>, IEEE Signal Process. Lett. <b>29</b> (2022) 937–941. <a href="https://doi.org/10.1109/LSP.2022.3156870">https://doi.org/10.1109/LSP.2022.3156870</a></li></ol>	

4. **E. Evert**, M. Vandecappelle, L. De Lathauwer: *A recursive eigenspace computation for the canonical polyadic decomposition*, SIAM J. Matrix Anal. Appl. **43** (2022) 274–300 <https://doi.org/10.1137/21M1423026>
5. **E. Evert**, L. De Lathauwer: *Guarantees for existence of a best canonical polyadic approximation of a noisy low-rank tensor*, SIAM J. Matrix Anal. Appl. **43** (2022) 328–369 <https://doi.org/10.1137/20M1381046>
6. **E. Evert**, Y. Fu, J.W. Helton, J. Yin: *Empirical properties of optima in free semidefinite programs*, published online in Experimental Mathematics (2021). <https://doi.org/10.1080/10586458.2021.1980457>
7. **E. Evert**: *The Arveson boundary of a free quadrilateral is given by a noncommutative variety*, Operators and Matrices. **15** (2021) 1351–1378 <https://dx.doi.org/10.7153/oam-2021-15-85>
8. **E. Evert**, J.W. Helton, S. Huang, J. Nie: *Efficient evaluation of noncommutative polynomials using tensor and noncommutative Waring decompositions*, Numer. Funct. Anal. Optim. **42** (2021) 39–68 <https://doi.org/10.1080/01630563.2020.1859530>
9. **E. Evert**, J.W. Helton: *Arveson extreme points span free spectrahedra*, Math. Ann. **375** (2019) 629–653. <https://doi.org/10.1007/s00208-019-01858-9>
10. **E. Evert**: *Matrix convex sets without absolute extreme points*, Linear Algebra Appl. **537** (2018) 287–301 <https://doi.org/10.1016/j.laa.2017.09.033>
11. **E. Evert**, J.W. Helton, I. Klep, S. McCullough: *Extreme points of matrix convex sets, free spectrahedra and dilation theory*, J. of Geom. Anal. **28** (2018) 1373–1498. <https://doi.org/10.1007/s12220-017-9866-4>
12. **E. Evert**, J.W. Helton, I. Klep, S. McCullough: *Circular free spectrahedra*, J. Math. Anal. Appl. **445** (2017) 1047–1070. <https://doi.org/10.1016/j.jmaa.2016.07.011>
13. K. Berry, M.S. Copenhaver, **E. Evert**, Y.H. Kim, T. Klingler, S.K. Narayan, S.T. Nghiem: *Factor posets of frames and dual frames in finite dimensions*, Involve **9** (2017) 237–248 <http://dx.doi.org/10.2140/involve.2016.9.237>

ACCEPTED  
ARTICLES

14. Domanov I., Vervliet N., **E. Evert**, L. De Lathauwer: *Decomposition of a tensor into multilinear rank- $(M_r, N_r, \cdot)$  terms*, ESAT-STADIUS, KU Leuven, Leuven, Belgium, Tech. Rep. 23-38, 2023. To appear in SIAM J. Matrix Anal. Appl. <https://ftp.esat.kuleuven.be/pub/stadius/nvervliet/domanov2023mndot.pdf>

PREPRINTS

15. A. Epperly, **E. Evert**, J.W. Helton, I. Klep: *Matrix extreme points and free extreme points of free spectrahedra*, preprint <https://arxiv.org/abs/2212.00748>

CONFERENCE  
PAPERS

16. A. Bhaskara, **E. Evert**, V. Srinivas, A. Vijayaraghavan: *New Tools for Smoothed Analysis: Least Singular Value Bounds for Random Matrices with Dependent Entries*, To appear in Annual ACM Symposium on Theory of Computing 2024.
17. **E. Evert**, M. Vandecappelle, L. De Lathauwer: *CPD computation via recursive eigenspace decompositions*, IEEE International Conference on Acoustics, Speech, and Signal Processing, May 2022. <https://doi.org/10.1109/ICASSP43922.2022.9747288>
18. **E. Evert**, Vervliet N., Domanov I., L. De Lathauwer: *Uniqueness result and algebraic algorithm for decomposition into multilinear rank- $(M_r, N_r, \cdot)$  terms and joint block diagonalization*, To appear at IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, December 2023. <https://ftp.esat.kuleuven.be/pub/stadius/nvervliet/evert2023uniquenessresult.pdf>

PROGRAMMING	<b>E. Evert</b> , M. de Oliveira, J. Yin, and J.W. Helton: NCSE 2.3: An NCAgebra package for optimization over free spectrahedra, Feb. 2021. Available online. <a href="https://github.com/NCAgebra/UserNCNotebooks/tree/master/NCSpectrahedronExtreme">https://github.com/NCAgebra/UserNCNotebooks/tree/master/NCSpectrahedronExtreme</a>																																																		
SCIENCE COMMUNICATION	<b>E. Evert</b> , L. De Lathauwer: <i>Tensors and multilinear algebra: what and why</i> , Leuven.AI Stories, 2023. <a href="https://ai.kuleuven.be/stories/post/2023-01-10-tensorlab/">https://ai.kuleuven.be/stories/post/2023-01-10-tensorlab/</a>																																																		
PRESENTATIONS	<p>Invited Conference Talks</p> <table border="0"> <tr> <td>Conference of the International Linear Algebra Society</td> <td style="text-align: right;">June 2023</td> </tr> <tr> <td>SIAM Conference on Optimization</td> <td style="text-align: right;">May 2023</td> </tr> <tr> <td>Amer. Math Soc. 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RESEARCH PROGRAMS	<p>Noncommutative Inequalities, hosted by American Institute of Mathematics</p> <p style="text-align: right;">June 2021</p> <p>Tensor Methods and Emerging Applications to the Physical and Data Sciences, hosted by Institute for Pure &amp; Applied Mathematics</p> <p style="text-align: right;">March-June 2021</p>																																																		

SCHOOLS	Summer School in Algebraic Statistics, hosted by The Arctic University of Norway	September 2018
	EURASIP Summer School on Tensor-Based Signal Processing, hosted by KU Leuven	August 2018
TEACHING EXPERIENCE	Instructor at Northwestern	Fall 2022 to Present
	CS 496: Mathematical and Computational Foundations of Tensors and Applications	Spring 2023
	CS 212: Mathematical Foundations of Computer Science	Fall, Winter 2023 Fall 2022
	Teaching Assistant at UC San Diego	Fall 2013 to June 2018
	Math 152: Applicable Math and Computing	Winter 2018
	Math 202A: Applied Algebra	Fall 2017
	Math 245C: Convex Analysis and Optimization	Spring 2017
	Math 202B: Applied Algebra II	Winter 2017
	Math 18: Linear Algebra	Fall 2016
	Math 10C: Calculus III	Winter 2015
COMPUTATIONAL EXPERIENCE	Math 20C: Calculus and Analytic Geometry for Science and Engineering	Fall 2013, Spring 2014
	Math 20D: Introduction to Differential Equations	Fall 2014, Winter 2016
	Math 20B: Calculus for Science and Engineering	Winter 2014, Fall 2015
	Computer Programming: Mathematica Noncommutative Computer Algebra Lead author of NCSE package for NCAAlgebra Matlab Tensorlab Semidefinite and Linear Programming	
AWARDS	UC San Diego, Department of Mathematics Powell Dissertation Fellowship	December 2017
	Virgina Tech, Department of Mathematics Department of Mathematics Outstanding Senior	May 2013
PROFESSIONAL MEMBERSHIPS	American Mathematical Society International Linear Algebra Society Society for Industrial and Applied Mathematics	