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# Ngoc Mai Tran

## Academic positions

- 2017–current **Assistant Professor**, *Mathematics*, University of Texas at Austin, USA.
- 2018–current **Bonn Research Fellow**, *Mathematics*, Hausdorff Center for Mathematics, Bonn, Germany.
- 2015–2017 **W-2 Professor**, *Mathematics*, University of Bonn, Germany.
- 2013–2015 **Simons Postdoctoral Fellow**, *Mathematics*, University of Texas at Austin, USA.

## Education

- 2009–2013 **PhD**, *Statistics*, University of California at Berkeley, USA.
- 2007–2008 **Bachelor of Science (Honours, First Class)**, *Mathematics and Statistics*, University of Melbourne, Australia.
- 2005–2007 **Bachelor of Science**, *Mathematics*, University of Newcastle, Australia.

## Employment History

- 2008–2009 **Statistician**, *Brain Resource Company*, Sydney, Australia.  
Developed new ECG autoscoring algorithms. Analyzed EEG/ECG data in 20,000 subjects.
- 2006–2017 **Statistician**, *Research and Training Center for Community Development*, Hanoi, Vietnam.  
Analyzed data for projects funded by the World Health Organization, World Wildlife Foundation, and the Australian Research Council.

## Publications

- 2020 E Robeva, B Sturmfels, [N M Tran](#) and C Uhler, to appear in *Scandinavian Journal of Statistics*, arXiv:1806.10120
- 2019 A Haupt, M Khatami, T Schultz and [N M Tran](#), *Classification on Large Networks: A Quantitative Bound via Motifs and Graphons*, to appear in Proceedings of the AWM Research Symposium
- 2019 R Mulas and [N M Tran](#), *Minimal Embedding Dimensions of Connected Neural Codes*, *Journal of Algebraic Statistics*
- 2019 B Lin and [N M Tran](#), *Two-player incentive compatible outcome functions are affine maximizers*, *Linear Algebra and its Applications*, 578:133 – 152
- 2019 F Baccelli and [N M Tran](#), *Poisson Tropical Plane Curves*, *Stochastic Processes and their Applications*

- 2019 M Johnson and N M Tran, *Geometry and algorithms for upper triangular tropical matrix identities*, Journal of Algebra, 530:470 – 507, 2019
- 2018 N M Tran, M Osipenko and W Haerdle, *Principal Component Analysis in an Asymmetric Norm*, Journal of Multivariate Analysis, 171:1–21, 2019
- 2018 N M Tran and Josephine Yu, *Product-Mix Auctions and Tropical Geometry*, to appear in Mathematics of Operations Research
- 2017 N M Tran and C Hillar, *Robust Exponential Memory in Hopfield Networks*, The Journal of Mathematical Neuroscience, 8(1):1, 2018
- 2017 N M Tran, *Enumerating Polytopes*, Journal of Combinatorial Theory, Series A 151 (2017): 1-22.
- 2017 N M Tran and Jed Yang, *Antibiotics Time Machines are hard to build*, Notices of the AMS, 64(10), 2017
- 2016 R Morisson and N M Tran, *Commuting Tropical Variety*, Linear Algebra and its Applications, 507, 300-321
- 2016 F Baccelli and N M Tran, *Zeros of Random Tropical Polynomials, Random Polygons and Stick-breaking*, Transactions of the American Mathematical Society 368(10), 7281-7303
- 2016 N M Tran, *HodgeRank is the Limit of Perron Rank*, Mathematics of Operations Research 41(2), 643-647
- 2015 J Pitman and N M Tran, *Size-biased Permutation of an i.i.d Sequence*, Bernoulli 21(4), 2484–2512
- 2015 I Fiete and N M Tran, *Linear-complexity denoising of the exponential-capacity grid cell code*, Computational and Systems Neuroscience (COSYNE) 2015
- 2015 N M Tran, *The PerronRank Family: A Brief Review*, Evolutionary and Institutional Economics Review 12(1), 213-221
- 2014 I Fiete, D J Schwab and N M Tran, *A binary Hopfield network with  $1/\log(n)$  information rate and applications to grid cell decoding*, Workshop on Biological Distributed Algorithms 2014
- 2014 N M Tran, *Polytopes and Tropical Eigenspaces: Cones of Linearity*, Discrete & Computational Geometry 51(3), 539–558
- 2013 B Sturmfels and N M Tran, *Combinatorial types of tropical eigenvectors*, Bulletin London Mathematical Society 45, 27-36
- 2013 N M Tran, *Pairwise ranking: choice of method can produce arbitrarily different rank order*, Linear Algebra and its Applications 438, 1012-1024
- 2009 M H Pham, T Tran, T D Tran, N M Tran, V D Dao, K P Nguyen, T D Le , *Measuring the risk of catastrophic expenditure: the CATA and IMPOOR indicators of Vietnam during 1993-2004*, Journal of the Central Institute for Medical Science Information of Vietnam, 7 (2009) 17-21
- 2007 D Cotton, N M Tran and C Waters, *Sunspot number, Southern Oscillation Index and their correlation to rainfall*, Proceedings of the 7th Australian Space Science Conference (2007) 150-161

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## Preprint

- 2020 H Zhu, X Li, L Sun, F He, Z Zhao, L Luan, C Xie and N M Tran, *Clustering with fast, automated and reproducible assessment applied to longitudinal neural tracking*, arXiv:2003.08533
- 2020 C Améndola, C Klüppelberg, S Lauritzen, and N M Tran, *Conditional independence in max-linear Bayesian networks*, arXiv:2002.09233
- 2020 E O'Reily and N M Tran, *Stochastic geometry to generalize the Mondrian process* arXiv:2002.00797
- 2019 N M Tran, *The finite matroid-based valuation conjecture is false* arXiv:1905.02287
- 2019 Y E Maazouz and N M Tran, *Statistics of Gaussians on local fields and their tropicalizations*, arXiv:1909.00559
- 2018 N M Tran, *Tropical Gaussians: A brief survey*, arXiv:1808.10843
- 2017 B Lin and N M Tran, *Linear and Rational Factorization of Tropical Polynomials*, arXiv:1707.03332
- 2016 Robert A Crowell N M Tran, *Tropical Geometry and Mechanism Design*, arXiv:1606.04880

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## Grants obtained

- 2009–2013 VEF Fellowship, *15,000 USD*
- 2015 DAAD Summer School, *50,000 euro*
- 2015 HCM Summer School, *50,000 euro*
- 2016 HCM Summer School, *50,000 euro*
- 2017–2019 CNS Startup grant, *50,000 USD*
- 2019–2021 Dewitt-Morette France-UT endowed excellence grants, PI, *10,000 USD*
- 2020–2021 Good Systems grant, PI, *98,000 USD*

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## Invited Talks

- Oct 2020 Panorama of Mathematics, Hausdorff Center for Mathematics, Bonn, Germany
- Jun 2020 Plenary Speaker, Stochastic Networks conference, Cornell
- May 2020 Gross substitutes and competitive equilibrium, ICERM, Brown University
- Mar 2020 Algebraic methods in Statistics, Oberwolfach, Germany
- Aug 2019 Geometric, Algebraic, and Topological Combinatorics, Oberwolfach, Germany
- Jul 2019 SIAM Applied Algebraic Geometry Conference, Bern, Switzerland
- June 2019 Conference on Network Games, Tropical Geometry, and Quantum Communication, TU Berlin
- Apr 2019 Association for Women in Mathematics, Houston, 2019
- Sep 2018 Boltzmann Machine Workshop, American Institute for Mathematics, California
- July 2018 Tropical Panorama, Max-Planck Institute for Mathematical Sciences, Leipzig
- June 2018 Plenary Speaker, 2018 Stochastic Networks conference, Edinburgh

March 2018 AMS Sectional Meeting, Ohio  
 Feb 2018 Semester program on Tropical Geometry, Mittag-Leffler Institute, Sweden  
 Mar 2017 Seminar, Australian National University  
 Mar 2017 Seminar, UT Austin  
 Feb 2017 Tropical Mathematics and its Applications, Warwick  
 Feb 2017 Seminar, Oxford University  
 Nov 2016 Topology and Geometry in Discrete Settings, ICERM, Brown University  
 Sept 2016 Vanderbilt Mechanism Design Conference, Nashville  
 Mar 2016 Spring School on Combinatorial Stochastic Processes, Hanoi, Vietnam  
 Oct 2016 Seminar, Ruhr-Bochum University  
 Jun 2016 SIAM Conference on Discrete Mathematics, Atlanta  
 Nov 2015 Workshop on Algebraic and Stochastic Aspects in Graph Theory, Osnabrueck  
 May 2015 Workshop on Nonlinear Algebra, Berlin  
 March 2015 Computational and Systems Neuroscience (Cosyne), Salt Lake City  
 Jan 2015 Session on Graph Theory, Combinatorics and Discrete Geometry, AMS Joint Meeting  
 Jan 2015 Session on Probability and Applications, AMS Joint Meeting  
 Dec 2014 Seminar, Humboldt University, Berlin  
 Fall 2014 Algebraic Geometry Seminar, Texas A&M  
 Oct 2014 Combinatorics Seminar, Georgia Tech  
 Aug 2014 Workshop on Mathematics and Economics, Hokkaido, Japan  
 Jul 2014 Algebraic Geometry and Optimization, Korea  
 May 2014 Math Colloquium, University of Queensland, Australia  
 May 2014 Statistics Seminar, University of Sydney, Australia  
 May 2014 Probability Seminar, University of Melbourne, Australia  
 Apr 2014 Seminar, Sam Houston State University, Texas  
 Apr 2014 Plenary Talk, CombinaTexas, Houston  
 Mar 2014 Seminar on Stochastic Processes, San Diego  
 Jan 2014 Seminar, Vietnam Institute for Advanced Study in Mathematics, Vietnam  
 Jan 2014 Algebra Seminar, Hanoi Institute of Mathematics, Vietnam  
 Sep 2013 Random Structures Seminar, UT Austin  
 May 2013 Combinatorics Seminar, UC Berkeley  
 Apr 2013 Workshop on Mathematics of Partially Identified Objects, Oberwolfach, Germany  
 Apr 2013 Probability Seminar, UC Berkeley  
 Feb 2013 Seminar, Department of Mathematics, UT Austin  
 Nov 2012 Statistics Graduate Student Association Seminar, UC Berkeley  
 Nov 2012 Seminar, Center for Applied Statistics and Economics, Humboldt University, Berlin  
 Oct 2012 Workshop for Women in Probability, Duke University  
 Jun 2012 Seminar, Centre de Mathématiques Appliquées, École Polytechnique, Paris  
 Jun 2012 Discrete Geometry seminar, Freie Universität Berlin

- Jun 2012 Tropical Mathematics and its Applications, UK
- Jun 2012 Mathematics Seminar, University of Manchester, UK
- Oct 2011 SIAM Conference on Applied Algebraic Geometry, North Carolina State
- Jul 2011 Kaiserslautern-Saarbruecken Biweekly Algebra Seminar, Germany
- Apr 2011 Algebraic Statistics seminar, UC Berkeley
- Jan 2011 Algebraic Geometry in the Sciences, Oslo, Norway
- May 2011 SIAM Conference on Optimization, Darmstadt, Germany
- Jul 2007 International Center of Excellence for Education in Mathematics (ICE-EM), Graduate School in Statistics, Australia

### Conference organized

- July 2019 Minisymposium on Tropical Mathematics, SIAM AG 2019
- April 2017 Hausdorff Summer School on Large Networks and their applications, Bonn, Germany
- June 2016 SIAM Minisymposium on Tropical Algebra and its applications, Atlanta, USA
- May 2016 Hausdorff Summer School on Tropical Geometry and Economics, Bonn, Germany
- Mar 2016 DAAD Spring School on Combinatorial Stochastic Processes, Hanoi, Vietnam

### Master Students and Postdoc

- Jul 2017 - Bo Lin, postdoc
- Dec 2018
- Jul 2015 - Spencer Backman, postdoc
- Apr 2017
- Jul 2017 Max Goldowsky, *Topics in Mathematical Neuroscience*
- Jul 2017 Andreas Haupt, *Making Sparse Graphons Work*
- Dec 2017 Raffaella Mulas, *Topology of Neural Codes*
- Dec 2017 Silvia Cavadas, *Exchangeability in features allocations*
- Jul 2018 Robert Crowell, *Tropical geometry and economics*

### Honors and Awards

- 2018–current **Bonn Research Fellow**, Hausdorff Center for Mathematics, Bonn, Germany.
- 2017–current **Honorary Senior Lecturer (Level C)**, Australian National University, Australia.
- 2015–2017 *Bonn Junior Fellow*, Hausdorff Center for Mathematics
- 2013–2015 *Postdoctoral Fellow*, Simons Foundation
- 2009–2015 *Fellow*, Vietnam Education Foundation

### Teaching Experience

- Spring 2019 Lecturer, Stochastic Tropical Geometry, Department of Mathematics, UT Austin
- Fall 2017, 2018, 2019 Lecturer, Applied Statistics, Department of Mathematics, UT Austin
- Fall 2017 Lecturer, Probability 1, Department of Mathematics, UT Austin

- Summer 2017 Lecturer, Topics in Exchangeability (graduate class), Department of Mathematics, University of Bonn
- Winter 2016 Lecturer, Open problems in Combinatorial Stochastic Processes (graduate class), Department of Mathematics, University of Bonn
- Summer 2016 Lecturer, Combinatorial Stochastic Processes (graduate class), Department of Mathematics, University of Bonn
- Winter 2015 Lecturer, Mathematical Neuroscience (graduate class), Department of Mathematics, University of Bonn
- Fall 2014 Lecturer, Enumerative Combinatorics (graduate class), Department of Mathematics, UT Austin
- Fall 2013 Lecturer, Multivariable Calculus M408D, Department of Mathematics, UT Austin
- Fall 2012 Graduate Student Instructor, Calculus, Statistics and Combinatorics Math10A, Department of Mathematics, UC Berkeley
- Fall and Spring 2010 Graduate Student Instructor, Upper-division Statistics Stat131A, Department of Statistics, UC Berkeley
- Summer 2010 Graduate Student Instructor, Introductory Statistics Stat2 (online course), Department of Statistics, UC Berkeley
- 2008 Graduate Student Instructor, Upper-division Probability Theory, Department of Mathematics, University of Melbourne
- 2008 Graduate Student Instructor, Mathematics for Primary School Teachers, Department of Mathematics, University of Newcastle at Ourimbah
- 2007 Graduate Student Instructor, Multivariable Calculus, Department of Mathematics, University of Newcastle
- 2006 Graduate Student Instructor, Statistics for Business, Department of Mathematics, University of Newcastle

## Skills

- Fluent: English, Vietnamese
- Intermediate: Japanese (B1), German (A2), Spanish (A2)
- Fluent: Java, R, Python, ActionScript, SPSS, Stata, LaTeX
- Intermediate: Linux, Scala
- Basics: Perl, Awk, C, HTML, Lua, SAS

## Professional Services

- Associate Editor Bernoulli
- Reviewer AMS Mathematical Reviews, zbMath, IEEE Transactions on Multimedia, Journal of Combinatorial Theory Series A, Annals of Applied Probability, PLOS One Biology, AISTATS, NIPS, Journal of Applied Probability
- Organizer Research discussions meetings between graduate students in statistics and social sciences, UC Berkeley, 2013

- Organizer Random Structures Seminar, Department of Mathematics, UT Austin, 2013, 2014, 2015
- Organizer Statistics Graduate Student Association Seminar, 2011, 2012
- Organizer Berkeley Optimization Day, 2010
- Active Member Women In Probability Group, 2013–current