Curriculum Vitae

Name	: Emre Mengi
Date of Birth	: February 27, 1978
Place of Birth	: Ankara, Turkey
Nationality	: Turkish
Address	: Koç University
	Department of Mathematics
	Rumelifeneri Yolu 34450
	Sarıyer, Istanbul / Turkey
Phone	: +90 (212) 3381658 (Office)
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Current and Past Positions

2023-present
Professor
Department of Mathematics
Koç University

2015-2023
Associate Professor
Department of Mathematics
Koç University

2009-2015
Assistant Professor
Department of Mathematics
Koç University

2006-2009
S.E.W. Assistant Professor
Department of Mathematics
University of California, San Diego

2001-2006
Graduate Research and Teaching Assistant
Computer Science Department
Courant Institute of Mathematical Sciences
New York University

Education

Ph.D.	Courant Institute of Mathematical Sciences New York University, September 2006 Thesis Title: *Measures for Robust Stability and Controllability* Ph.D. Supervisor: Michael L. Overton
B.S.	Department of Computer Engineering Middle East Technical University, Turkey, June 2000 *with a high honor degree*

Awards and Honors

2014	BAGEP award Turkish Academy of Science
2008	Householder Award XIII - Honorable Mention Householder Symposium
2007	Leslie Fox Second Prize Institute of Mathematics and its Applications (IMA)
2007	Janet Fabri Prize - Honorable Mention Courant Institute of Mathematical Sciences, New York University
2004	Young Researcher Award First International Conference on Continuous Optimization
2001-2006	The Henry M. MacCracken Fellowship from the Graduate School of Arts and Science of New York University

Research Projects

July 2016-June 2019   TUBITAK - ARRS (joint Turkish - Slovenian project with
                          Bor Plestenjak from University of Ljubljana)
                          Title : Efficient algorithms for multi-parameter eigenvalue
                          problems with three or more parameters and their analyses
                          Project No : 115F5855
                          Role in the Project : Principal Investigator

June 2013-May 2015   TUBITAK - FWO (joint Turkish - Belgian project with
                          Karl Meerbergen from KU-Leuven)
                          Title : Support function based algorithms for large-scale
                          and nonlinear eigenvalue optimization
                          Project No : 113T053
                          Role in the Project : Principal Investigator

Sep 2010-Aug 2014   Marie Curie - FP7
                          International Reintegration Grants (IRG)
                          Title : Lipschitz-based optimization of singular values
                          with applications to dynamical systems
                          Project No : PIRG07-GA-2010-268355
                          Role in the Project : Principal Investigator

May 2010-April 2012   TUBITAK
                          (The Scientific and Technological Research Council of Turkey)
                          Title : Optimization of symmetric eigenvalues and its
                          applications to dynamical systems
                          Project No : 109T660 (Career Grant)
                          Role in the Project : Principal Investigator

2004-2007   NSF (National Science Foundation)
                          Title : Optimization of Pseudospectra
                          Project No : DMS-0412049
                          Role in the Project : Researcher

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Papers and Manuscripts

Most of the papers and manuscripts below can be reached from the following website: `http://home.ku.edu.tr/~emengi/papers.html`

- E. Mengi and M. L. Overton, Algorithms for the computation of the pseudospectral radius and the numerical radius of a matrix, *IMA J. Numer. Anal.*, 25(4):648-669, 2005.

- M. Gu, E. Mengi, M. L. Overton, J. Xia and J. Zhu, Fast methods for estimating the distance to uncontrollability, *SIAM J. Matrix Anal. Appl.*, 28(2):477-502, 2006.

- D. Kresner and E. Mengi, Structure preserving eigenvalue solvers for robust stability and controllability estimates, in proceedings of *the 45th IEEE conference on control and decision* 5174-5179, 2006.

- E. Mengi, On the estimation of the distance to uncontrollability for higher order systems, *SIAM J. Matrix Anal. Appl.*, 30(1):154-172, 2008.

- E. Mengi, Locating a nearest matrix with an eigenvalue of prespecified algebraic multiplicity, *Numer. Math.*, 118(1):109-135, 2011.

- E. Mengi, Nearest linear systems with highly deficient reachable subspaces, *SIAM J. Matrix Anal. Appl.*, 33(3):1000-1017, 2012.

- D. Kressner, E. Mengi, I. Nakic and N. Truhar, Generalized eigenvalue problems with specified eigenvalues, *IMA J. Numer. Anal.*, 34(2):480-501, 2014.

- M.Kilic, E. Mengi, E. A. Yildirim and M. Kilic, Numerical optimization of eigenvalues of Hermitian matrix functions, *SIAM J. Matrix Anal. Appl.*, 35(2):699-724, 2014.

- M. Karow, D. Kressner and E. Mengi, Nonlinear eigenvalue problems with specified eigenvalues, *SIAM J. Matrix Anal. Appl.*, 35(3):819-834, 2014.

- M. Karow and E. Mengi, Matrix polynomials with specified eigenvalues, *Linear Algebra Appl.*, 466:457-482, 2015.

- E. Mengi, A support function based algorithm for optimization with eigenvalue constraints, *SIAM J. Optim.*, 27(1):246-268, 2017.

- K. Meerbergen, E. Mengi, W. Michiels and R. Van Beeumen, Computation of pseudospecral abscissa for large scale nonlinear eigenvalue problems, *IMA J. Numer. Anal.*, 37(4):1831-1863, 2017.

- N. Aliyev, P. Benner, E. Mengi, P. Schwerdtner and M. Voigt, Large-scale computation of L-infinity norms by a greedy subspace method, *SIAM J. Matrix Anal. Appl.*, 38(4):1496-1516, 2017.

- F. Kangal, K. Meerbergen, E. Mengi and W. Michiels, A subspace method for large-scale eigenvalue optimization, *SIAM J. Matrix Anal. Appl.*, 39(1):48-82, 2018.

- S. Onal, G. Uludag, M. Oray, E. Mengi, C. P. Herbort, M. Akman, M. M. Metin, A. Koc Akbay and I. Tugal Tutkun, Quantitative analysis of structural alterations in the choroid of patients with active Behcet uvetis, *Retina - J. Ret. Vit. Dis.*, 38(4):828-840, 2018.

- E. Mengi, Large-scale and global maximization of the distance to instability, *SIAM J. Matrix Anal. Appl.*, 39(4):1776-1809, 2018.

- M. E. Hochstenbach, K. Meerbergen, E. Mengi and B. Plestenjak, Subspace methods for three-parameter eigenvalue problems, *Numer. Linear Algebra Appl.*, 26(4):e2240, 2019. (22 pages)

- F. Kangal and E. Mengi, Nonsmooth algorithms for minimizing the largest eigenvalue with applications to inner numerical radius, *IMA J. Numer. Anal.*, 40(4):2342-2376, 2020.

- N. Aliyev, V. Mehrmann and E. Mengi, Approximation of stability radii for large-scale dissipative Hamiltonian systems, *Adv. Comput. Math.*, 46:6, 2020. (28 pages)

- N. Aliyev, P. Benner, E. Mengi and M. Voigt, A subspace framework for H-infinity norm minimization, *SIAM J. Matrix Anal. Appl.*, 41(2):928-956, 2020.

- P. Schwerdtner, E. Mengi and M. Voigt, Certifying global optimality for the $\mathcal{L}_\infty$-norm computation of large-scale descriptor systems, *IFAC-PapersOnLine*, 53(2):4279-4284, 2020.

- R. Aziz, E. Mengi and M. Voigt, Derivative interpolating subspace frameworks for nonlinear eigenvalue problems, *SIAM J. Sci. Comput.*, 44(4):A1833-A1858, 2022.

- E. Mengi, Large-scale estimation of dominant poles of a transfer function by an interpolatory framework, *SIAM J. Sci. Comput.*, 44(4):A2412-A2438, 2022.

- N. Aliyev and E. Mengi, Large-scale minimization of the pseudospectral abscissa, 2023, submitted. (Preprint: arXiv:2208.07540)

- E. Mengi, A subspace framework for $\mathcal{L}_\infty$ model reduction, 2023, submitted. (Preprint: arXiv:2309.08011)

Graduate Students Supervised

Ph.D.

- Nicat Aliyev (Graduated in 2018).
  Thesis Title: Approximation and Minimization of the H-Infinity Norms of Large-Scale Control Systems

- Fatih Kangal (Graduated in 2018).
  Thesis Title: Large-Scale and Nonconvex Eigenvalue Optimization

- Serap Gümüş (Graduated in 2020, I served as co-supervisor).
  Thesis Title: Global Behavior of Solutions of Nonlinear Dissipative Equations of Nonclassical Types

M.S.

- Mustafa Kılıç (Graduated in 2012).
  Thesis Title: Eigenvalue Optimization of Hermitian Functions - Theory, Applications and Algorithms

- Fatih Kangal (Graduated in 2013).
  Thesis Title: Generalized Pseudospectra in Connection with Multiple Eigenvalues

- Zuhal Demireli (Graduated in 2016).
  Thesis Title: Pseudospectral Radii of Large-Scale Matrices

- Tamey Cansın Ekşi (Graduated in 2023).
  Thesis Title: Large-Scale Estimation of the Stability Radius

Editorial Boards

- American Institute of Mathematical Sciences — Numerical Algebra, Control & Optimization

- Hacettepe Journal of Mathematics and Statistics

Refereeing Duties

I have been serving as a referee in the following journals or conference proceedings: AMS Mathematics of Computation, SIAM Journal on Matrix Analysis and Applications, Numerische Mathematik, SIAM Journal on Scientific Computing, Linear Algebra and its Applications, ESAIM: Contol, Optimisation and Calculus of Variations, ZAMM - Journal of Applied Mathematics and Mechanics, Journal of Optimization Theory and Applications, IEEE Transactions on Automatic Control, System and Control Letters, Numerical Algorithms, Applied Numerical Mathematics, Calcolo, Differential Equations and Dynamical Systems, Electronic Transactions on Numerical Analysis, Proceedings of the IEEE Conference on Control and Decision, Operators and Matrices, Electronic Journal of Linear Algebra, Linear and Multilinear Algebra, Turkish Journal of Mathematics, Turkish Journal of Electrical Engineering and Computer Sciences, Mathematics and Computers in Simulation, International Journal of Dynamics and Control.

Teaching Experience

I have taught at UC San Diego between 2006-2009, and have been teaching at Koç University since 2009 on the following topics:

- Undergraduate courses on linear algebra, differential equations, numerical analysis as well as various calculus courses.

- Graduate courses on numerical linear algebra, numerical differential equations and numerical optimization.