CONTACT INFORMATION

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AREA OF RESEARCH

- Continuous Optimization
- Numerical Optimization

EDUCATION

2011–2016 **Doctor of Philosophy**, *Applied Mathematics*, Wayne State University, Detroit
Thesis Title: *Variational Analysis and Stability in Optimization*
Advisor: Boris Mordukhovich
2011–2014 **Masters of Science**, *Applied Mathematics*, Wayne State University, Detroit
2004–2006 **Masters of Science**, *Applied Mathematics*, Kharazmi University, Tehran, Iran
2000–2004 **Bachelor of Science**, *Applied Mathematics*, Kharazmi University, Tehran, Iran

ACADEMIC POSITIONS

July 2022-Present **Associate Professor**, Department of Mathematics, Miami University, Oxford
Aug. 2016-July 2022 **Assistant Professor**, Department of Mathematics, Miami University, Oxford
Sep. 2012–May 2016 **Graduate Teaching Assistant**, Department of Mathematics, Wayne State University, Detroit
May 2010–May 2011 **Resident Researcher**, Institute for Research in Fundamental Sciences, Tehran, Iran
Nov. 2008–July 2009 **Researcher**, Department of Mathematics, Avignon University, France
Jan. 2010-May 2011 **Adjunct Faculty**, Department of Science, Qom University, Qom, Iran

PUBLICATIONS

24 **A Chain Rule for Strict Twice Epi-Differentiability and its Applications**, *To appear in SIAM J. Optim.* arXiv:2209.01489 (2022) (by N.T.V Hang and M. E. Sarabi)

23 **Local Convergence Analysis of Augmented Lagrangian Methods for Piecewise Linear-Quadratic Composite Optimization Problems**, *SIAM J. Optim.* 31 (2021), 2665–2694 (by N.T.V Hang and M. E. Sarabi)

22 **Augmented Lagrangian method for second-order conic programs under second-order sufficiency**, *J. Global Optim.* 82, (2022), 51–81 (by N.T.V Hang, B. S. Mordukhovich and M. E. Sarabi)

21 **Primal superlinear convergence of SQP methods in piecewise linear- quadratic composite optimization**, *Set-Valued Var. Anal.* 30, (2022), 1–37 (by M. E. Sarabi)

20 **Generalized Newton algorithms for tilt-stable minimizers in nonsmooth optimization**,*SIAM J. Optim.* 31 (2021), 1184–1214 (by B. S. Mordukhovich and M. E. Sarabi)

19 **Twice epi-differentiability of extended-real-valued functions with applications in composite optimization**, *SIAM J. Optim.* 30 (2020), 2379–2409 (by A. Mohammadi and M. E. Sarabi)

18 **Stability of KKT systems and superlinear convergence of the SQP method under parabolic regularity**, *J. Optim. Theory Appl.* 186 (2020), 731-758 (by A. Mohammadi, B. S. Mordukhovich and M. E. Sarabi)

17 **Parabolic regularity via geometric variational analysis**,*Trans. Amer. Soc.* 374 (2021), 1711–1763 (by A. Mohammadi, B. S. Mordukhovich and M. E. Sarabi)

16 **Variational analysis of composite models with applications to continuous optimization**, *Math. Oper. Res.* 47 (2021), 397–426 (by A. Mohammadi, B. S. Mordukhovich and M. E. Sarabi)

15 **Criticality of Lagrange multipliers in extended nonlinear optimization**, *Optimization* 70 (2021), 511-544 (by Hong Do, B. S. Mordukhovich and M. E. Sarabi)

14 **Criticality of Lagrange multipliers in variational systems**, *SIAM J. Optim.* 29 (2019), 1524–1557. (by B. S. Mordukhovich and M. E. Sarabi)

13 **Second-Order Analysis in Second-Order Cone Programming**, *Math. Program.* (2018), 180 (2020), 75–116 (by N.T.V. Hang, B. S. Mordukhovich and M. E. Sarabi)

12 **Critical Multipliers in Variational Systems via Second-Order Generalized Differentiation**, *Math. Program.* 169 (2018), 605–648 (by B. S. Mordukhovich and M. E. Sarabi)

11 **Stability Analysis for Composite Optimization Problems and Parametric Variational Systemsx**, *J. Optim. Theory Appl.* 172 (2017), 554-577 (by B. S. Mordukhovich and M. E. Sarabi)

10 **Generalized differentiation of piecewise linear functions in second-order variational analysis**, *Nonlinear Anal.* 132 (2016), 240-273 (by B. S. Mordukhovich and M. E. Sarabi)

9 **Second-order analysis of piecewise linear functions with applications to optimization and stability**, *J. Optim. Theory Appl.* (2016), 1-23 (by B. S. Mordukhovich and M. E. Sarabi)

8 **Full stability in second-order cone programming**, *SIAM J. Optim.* 24 (2014), no. 4, 1581-1613 (by B. S. Mordukhovich, J. V. Outrata and M. E. Sarabi)

7 **Variational analysis and full stability of optimal solutions to constrained and minimax problems**, *Nonlinear Anal.* 121 (2015), 36-53 (by B. S. Mordukhovich and M. E. Sarabi)

6 **Characterizations of full stability in constrained optimization**, *SIAM J. Optim.* 23 (2013), 1810-1849 (by B. S. Mordukhovich, R. T. Rockafellar and M. E. Sarabi)

5 **Pseudo-Hessian and Taylor's expansion for vector-valued functions**, *Nonlinear Anal.* 72 (2010), 1938-1948 (by E. Babolian and M. E. Sarabi)

4 **Existence of solutions in variational relation problems without convexity**, *J. Math. Anal. Appl.* 364 (2010), 544-555 (by D. T. Luc, M. E. Sarabi and A. Soubeyran)

3 **Revisiting the gap function of a multicriteria optimization problem**, *Int. J. Comput. Math.* 86 (2009), 860-863 (by M. E. Sarabi and M. Soleimani-damaneh)

2 **Taylor's expansion for $C^{1,1}$ functions in Asplund spaces**, *Nonlinear Anal.* 71 (2009), 5707-5711 (by M. E. Sarabi)

1 **Sufficient conditions for nonsmooth r-invexity**, *Numer. Funct. Anal. Optim.* 29 (2008), 674-686 (by M. Soleimani-damaneh and M. E. Sarabi)

PAPERS UNDER REVIEW

4 **Smoothness of Subgradient Mappings and Its Applications in Parametric Optimization**, *Submitted to Math. Program.* arXiv:2311.06026 (2023) (by N.T.V Hang and M. E. Sarabi)

3 **Convergence of Augmented Lagrangian Methods for Composite Optimization Problems**, *Submitted to Math. Oper. Res.* arXiv:2307.15627 (2023) (by N.T.V Hang and M. E. Sarabi)

2 **Parabolic regularity of spectral functions. Part I: Theory**, *First revision in Math. Oper. Res.* arXiv:2301.04240 (2023) (by A. Mohammadi and M. E. Sarabi)

1 **Role of Subgradients in Variational Analysis of Polyhedral Functions**, *Submitted to J. Optim. Theory Appl.* arXiv:2207.07470 (2022) (by W. Jung, N.T.V Hang, and M. E. Sarabi)

TALKS

December 2023 **Worshop on Nonsmooth Optimization and Variational Analysis**, *The Hong Kong Polytechnic University* , Hong Kong.

Title: The role of subgradients in second-order variational analysis.

May 2023 **2023 SIAM Conference on Optimization**, *Seattle,* Washington.

Title: On the Equivalence of Metric Regularity and Strong Metric Regularity in Generalized Equations.

March 2023 **Colloquium talk, Department of Mathematics**, *Oakland University,* Rochester, MI.

Title: Twice Epi-Differentiability: Past, Present, and Future.

January 2023 **The 5th seminar national seminar on control and optimization**, *Yazd University, Iran* Online.

Title: Twice Epi-Differentiability: Past, Present, and Future.

December 2022 **Variational Analysis and Optimization Seminar**, *University of Michigan,* Online.

Title: Role of Subgradients in Variational Analysis of Composite Functions.

October 2022 **The 2022 Midwest Optimization Meeting**, *University of Waterloo,* Canada.

Title: A Characterization of Continuous differentiability of Proximal Mappings of Composite Functions.

September 2022 **The 2022 SIAM Great Lakes Section Annual Meeting**, *Wayne State University,* Online.

Title: Strict Twice Epi-Differentiability and its Applications.

January 2021 **Joint Mathematics Meetings**, *Special Session on "Variational Analysis and Optimization,"* Online.

Title: Twice epi-differentiability of extended-real-valued functions ands its remarkable applications.

January 2020 **Joint Mathematics Meetings**, *Special Session on "Set-Valued and Fuzzy-Valued Analysis with Applications,"* Denver, CO.

Title: Stability Properties of Lagrange Multipliers in Constrained Optimization problems.

August 2019 **Sixth International Conference on Continuous Optimization (ICCOPT)**, the Weierstrass Institute for Applied Analysis and Stochastic, Berlin, Germany.

Title: A Semismooth Inverse Mapping Theorem via Tilt Stability and Its Applications in the Newton Method.

December 2018 **International Workshop on Variational Analysis and Related Topics**, Hanoi Pedagogical University 2, Vietnam.

Title: Critical and Noncritical Lagrange Multipliers for generalized KKT Systems.

April 2018 **AMS Sectional Meeting**, *Special Session on "Set-Valued optimization and Variational Problems with Applications,"* Portland State University, OR.

Title: A Semismooth Inverse Mapping Theorem for C^{1+} Functions under Tilt Stability.

April 2017 **Global Optimization Conference (GOC-2017)**, Texas A & M University, TX.

Title: Critical Multipliers in Variational Systems via Second-Order Generalized Differentiation.

October 2016 **Midwest Optimization Meeting**, Department of Mathematics, Michigan State University.

Title: Newton Method for Prox-regular Functions.

January 2016 **Joint Mathematics Meetings**, *Special Session on "Set-Valued optimization and Variational Problems with Applications,"* Seattle, WA.

Title: Stability analysis of composite optimization problems with applications to critical multipliers.

October 2015 **Midwest Optimization Meeting**, Department of Mathematics, Loyola University, CI.

Title: Second-order analysis of piecewise linear functions with applications to stability.

July 2015 (Invited talk) **22nd International Symposium on Mathematical Programming**, *Special Session on "Variational Analysis in Nonsmooth Optimization,"* Pittsburgh University, PA.

Title: Second-order analysis of piecewise linear functions and its applications.

October 2014 **Midwest Optimization Meeting**, *Department of Mathematics*, Loyola University, CI.

Title: Full Stability of Optimal Solutions to Constrained and Minimax Problems.

May 2014 **Michigan Mathematics Meetings**, University of Michigan-Flint, MI.

Title: Full stability in second-order cone programming.

January 2014 **Joint Mathematics Meetings**, *Special Session on "Set-Valued optimization and Variational Problems with Applications,"* Baltimore, MD.

Title: Full stability in second-order cone programming.

October 2012 **Midwest Optimization Meeting**, Department of Mathematics, Western Michigan University, MI.

Title: Characterizations of full stability in constrained optimization.

May 2009 **Optimization Seminar group**, *Avignon University*, France.

Title: Existence of solutions in variational relation problems without convexity.

REFEREEING ACTIVITIES

- Reviewer for American Mathematical Society

- Journal of Optimization Letters
- Journal of Optimization
- Journal of Optimization Theory and Its Applications
- Journal of Global Optimization
- Set-Valued and Variational Analysis
- Journal of Inequalities and Applications
- SIAM Journal on Optimization
- Applied Mathematics and Optimization
- Operation Research Letters
- Mathematical Programming

EDITORIAL MEMBERSHIPS

2019-present A member of the editorial board of the Journal of Nonsmooth Analysis and Optimization.

2020-present A member of the editorial board of the Journal of Optimization Theory and Applications.

2022-present A member of the editorial board of Bulletin of the Iranian Mathematical Society.

PROFESSIONAL ACTIVITIES

1) Co-organizer of the 2018 Midwest Optimization Meeting, department of mathematics, Miami University, October 12-13, 2018.
2) Co-organizer of the 2020 Midwest Optimization Meeting, online, October 16-17, 2020.
3) Co-organizer of the 2023 Midwest Optimization Meeting, department of mathematics, University of Michigan, October 21-22, 2023.
4) Co-organizer of Variational Analysis and Applications cluster, 2023 SIAM Conference on Optimization, May 31 – June 3, 2023, Seattle, Washington.
5) Member of NSF Review Panel, 2018.

MEMBERSHIPS

2011-present American Mathematical Society (AMS)

2015-present Society for Industrial and Applied Mathematics (SIAM)

Awards

August 2021-August 2024 Second-Order Variational Properties of Composite Optimization Problems and its Applications, National Science Foundation, DMS 2108546 ($194,957.00)

Summer 2017 Dean's Award, School of Arts and Sciences, Miami University

January 2016 Graduate Student Travel Grants to the Joint Mathematics Meetings, American Mathematical Society

October 2015 Graduate Student Travel Grants to the AMS Sectional Meeting, American Mathematical Society

July 2015 Graduate Student Professional Travel Awards, Wayne State University

April 2015 The Karl W. and Helen L. Folley Endowed Mathematics Scholarship, Wayne State University

September 2014-May 2015 Thomas C. Rumble University Graduate Fellowship, Wayne State University

April 2014 The Karl W. and Helen L. Folley Endowed Mathematics Scholarship, Wayne State University

January 2015 Graduate Student Professional Travel Awards, Wayne State University

September 2011-September 2012 University Graduate Research Fellowship, Wayne State University

November 2008–July 2009 Graduate Student Travel Grants, Ministry of Science, Tehran, Iran

TEACHING ACTIVITIES

1) Calculus II (MTH 249): Fall 16, 17, 19, 20, 23.
2) Calculus II (MTH 251): Fall 18, 22 and Spring 22.
3) Calculus III: Spring 18, 21, 23 and Fall 21.
4) Differential Equations: Fall 16.
5) Introduction to Optimization: Spring 17, 20 and Fall 20, 22.
6) Advanced Optimization: Fall 17 and Spring 21, 23
7) Real Analysis: Fall 18, 21.
8) Topics in Financial Mathematics: Spring 22
9) Introduction to Technical Computing, Fall 23

MASTER PROJECT SUPERVISION

1) Anthony Pecoraro: The Sequential Quadratic Programming Algorithm for Nonlinear Programming Problems, August 2017.
2) Obed Amo: Subgradient Methods for Convex Optimization Problems, July 2021.
3) Woosuk Jung: Reduction Lemma for Polyhedral Sets and Functions and its Applications, July 2021.
4) S. M. Mustaquim: Optimality and Duality in Linear Semidefinite Programming, July 2021.

Departmental service

2016-2017 Undergraduate Committee

2018-present Graduate Committee

2017-August 2023 Faculty Advisor for Pi Mu Epsilon

2022-present Chair of Strategic Planning Committee, responsible for new Programs, Certificates, and Experiential Learning Opportunities.

June 2021 Optimization Comprehensive Exam for Master Students