

Masoud Fatemi

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Assistance Professor in Applied Mathematics and Numerical Optimization

Department Of Mathematics

K. N. Toosi University of technology

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EDUCATION

2006–2011	Doctor of Philosophy Department of Mathematics, <i>Sharif University of Technology</i> Thesis: Design and analysis of filter trust-region algorithm for unconstrained optimization Supervisor: Professor Nezam Mahdavi-Amiri
2004–2006	Master of Applied Science Department of Mathematics, <i>Sharif University of Technology</i> Thesis: Primal-Dual interior point algorithms for nonconvex optimization Supervisor: Professor Nezam Mahdavi-Amiri
2000–2004	Bachelor of Applied Science Department of Mathematics, <i>Isfahan University</i>

RESEARCH INTERESTS

- Mathematical Modeling and Matrix Algebra
- Smooth optimization
- Integer Programming
- Machine Learning and Image processing
- Operation Research
- Recently, my active field of research is developing and improving optimization algorithms in the context of machine learning and signal processing.

PUBLICATIONS

Publication in refereed journals

1. M. Fatemi and N. Madavi-amiri, A filter trust-region algorithm for unconstrained optimization with strong global convergence properties. *Comput Optim Appl*, (2012) 52:239–266.
2. S. Babaie-Kafaki, M. Fatemi and N. Mahdavi-Amiri, Two effective hybrid conjugate gradient algorithms based on modified BFGS updates, *Numerical Algorithm*, (2011) 58:315-331.
3. M. Fatemi and N. Madavi-amiri, A non-monotone trust region algorithm for unconstrained optimization with dynamic reference iteration updates using filter, *Optimization*, (2012) 61: 733-763.
4. S. Babaie-Kafaki, M. Fatemi, A modified two-point stepsize gradient algorithm for unconstrained optimization, *Optimization Method and Software*, (2013) 28 (5): 1040-1050.
5. M. Fatemi and N. Madavi-amiri, A gradient projection filter trust-region algorithm for box constrained optimization. *Pacific journal on optimization*, (2014) 10(1): 229-242.

6. S. Fathi Hafshejani , M. Fatemi and M. Reza Peyghami, An interior-point algorithm for linear complementarity problem based on a trigonometric kernel function, *Journal of Applied Mathematics and Computing*, (2015) 48: 111-128.
7. M. Fatemi, An optimal parameter for dai-Liao family of conjugate gradient methods, *Optim Theory and Appl*, (2016) 169(2): 587-605.
8. M. Fatemi, A new efficient conjugate gradient method for unconstrained optimization, *Journal of Comput and Applied Math*, (2016) 300: 207-216.
9. M. Fatemi and S. Babaie-Kafaki, Two extensions of the Dai-Liao method with sufficient descent property based on a penalization scheme, *Bull. Comput. Appl. Math*, (2016) 4 (1):7-19.
10. M. Fatemi, A scaled conjugate gradient method for nonlinear unconstrained optimization, *Optimization Methods and Software*, (2017) 5(32) :1095-1112.
11. M. Fatemi, A limited memory class of conjugate gradient methods, *PACIFIC JOURNAL OF OPTIMIZATION*, (2019) 15 (3), 457-475.
12. M. Fatemi, An efficient conjugate gradient method with a limited memory structure for unconstrained optimization, *Computational and applied mathematics*, (2019) 38 (2), 59.

Publications in refereed conference proceedings

1. M. Fatemi and N. Madavi-amiri, A globally convergent trust-region algorithm for unconstrained optimization using filter, Presented at 4th International Conference of OR, 18-19 May 2011, University of Guilan.
2. F. Arzani, M. Peyghami and M.Fatemi, A filter Barzilai-Borwein method, Presented at 7th International Conference of OR, 14-15 May 2014, University of Semnan.

Teaching

Graduate Teaching.

Courses Taught.

- Numerical optimization
- Non-smooth optimization
- Advanced non-linear optimization
- Calculus of variation
- Integer Programming
- Convex Optimization

Supervision and Mentorship.

- Fahimeh Abdollahi, Ph.D., A New Conjugate Gradient Method for Non-Smooth Optimization, In Progress.
- Mohammad saeed Alamdari, Ph.D., A New Approach for Solving Common Optimization Problems Arising in Image and signal Processing. In Progress.
- Zahra Mahdevar, M.A., Optimization Methods for Large Scaled Machine Learning Problems with Stochastic Approaches. Completed Jan 2020.
- Saba Asgarzadeh, M.A., Sparse Signal Estimations via Non-Separable Regularization Functions. Completed Jan 2020.
- Zahra Zaeri, M.A., Coordinate Descent Methods with Application in Machine Learning. Completed Sep 2019.
- Hadi Rasekhi Nezhad, M.A., Learning Graphical Models With Hubs, Completed Feb 2019.
- S.M.R. Karimpour, M.A., ADMM for Nonconvex Optimization with Its Application in Machine Learning. Completed Sep 2019.
- Zahra Alizadeh, M.A., A Sequential Ascending Parameter Method for Constrained Optimization. Completed Feb 2018.

- Hossein Seyedi, M.A., Introducing an Exact Algorithm for Graph Partitioning based on A QP Program. Completed Feb 2018.
- Mehrdad Almasi, M.A., Application of Data Mining in Global Optimization Algorithms. Completed Feb 2017.
- Parinaz Parmour, M.A., Optimization Methods for Machine Learning with Application in Bankruptcy Prediction. Completed Feb 2017.
- Hani Ahmadzadeh, M.A., A Non-Monotone Filter Method for Nonlinear Optimization. Completed Sep 2014.
- Meysam Shojaei, M.A., Direct Multi-Search for Multi-objective Optimization. Completed Sep 2014.
- Zohre Aminifard, M.A., Solving Quadratic Knapsack Problem Using Dynamic Programming and Semi definite Relaxation. Completed Sep 2013.

Undergraduate Teaching.

Courses Taught.

- Linear Optimization
- Combinatorial Optimization
- Calculus I-III
- Linear Algebra
- Numerical Analysis and Differential Equation

Supervision and Mentorship.

- Hadis Naderi, B.A., Duality Theory in Convex and Non-Convex Optimization. Completed Sep 2018.
- Fatemeh Sabet-Nejad, B.A., Investigation of Transportation and Assignment Problems. Completed Sep 2019.
- Asma Amjadian, B.A., Minimum Cost Network Flows. Completed Sep 2019.

RESEARCH EXPERIENCE

2010-2013	Malek-Ashtar University of Technology Project: Mathematics of fractal solar cell
2007-2008	Sharif University of technology Project: Catmull-Rom spline in computers graphics.
2008-2009	Sharif University of technology Project: Solving boundary value differential equations with finite element Mixed and Hybrid methods.

Software Abilities

- Matlab, Maple
- C++
- CPLEX