

Curriculum Vitae

Alaeddin Malek

Speciality: Applied Mathematics

Academic Status: Associate Professor

PhD: Applied Mathematics

MS: Applied Mathematics

BS/BA: Mathematics

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Alaeddin Malek received his M.Sc. and Ph.D. degrees in Applied Mathematics from McGill University, Canada, and University of Wales (Aberystwyth), UK, in the years 1986 and 1991, respectively.

At the moment he is an Associate Professor in the Department of Applied Mathematics, Tarbiat Modares University, Tehran, Iran. His current research interests include solutions of real-life problems, oil industry problems, neural networks, optimization, dynamical systems, heat distribution for nano and micro scale particles, thin films and numerical solutions for partial differential equations (Finite Difference and Spectral Methods).

He is the co-author in the 21 books published by MOASESEH FARHANGI AHLE GHALAM written in the Persian language. He has published more than 30 papers in the international journals. He teaches two postgraduate courses in applied mathematics every semester. The courses are Advanced OR, Optimization, Numerical Solutions for PDEs and Fourier Analysis.

He graduated more than 55 M.Sc. and 3 Ph.D. students. He is supervisor of the three M.Sc. and five Ph.D. students at present time. Dr. Malek is a member of Iranian mathematical Society. He was the keynote speaker for the International Conference of Mathematical Sciences in 2009. His talk entitled "Optimization with Recurrent Neural Networks: Recent Advances and New Perspectives".

Some Published Journal Papers of Dr. Alaeddin Malek

- [25] Malek, A.; Ezazipour, S.; Hosseinipour-Mahani, N. Double projection neural network model for solving pseudomonotone variational inequalities. *Fixed Point Theory* 12 (2011), no. 2, 401-418, [47J25](#) ([49J40](#))
- [24] Hajipour, Mojtaba; Malek, Alaeddin An efficient high order modified WENO scheme for nonlinear parabolic equations. *Int. J. Appl. Math.* 24 (2011), no. 3, 443-457, [65M06](#) ([35K20](#) [35K55](#))
- [23] Heidari, Hanif; Malek, Alaeddin Optimal boundary control for hyperdiffusion equation. *Kybernetika (Prague)* 46 (2010), no. 5, 907-925, [49K20](#) ([49J20](#) [49M25](#))
- [22] Malek, A.; Hosseinipour-Mahani, N.; Ezazipour, S. Efficient recurrent neural network model for the solution of general nonlinear optimization problems. *Optim. Methods Softw.* 25 (2010), no. 4-6, 489-506, [90C30](#)
- [21] Vaissmoradi, N.; Malek, A.; Momeni-Masuleh, S. H. L_2 -stability analysis of novel ETD scheme for Kuramoto-Sivashinsky equations. *J. Comput. Appl. Math.* 234 (2010), no. 8, 2493-2500. (Reviewer: Jean-Pierre Croisille), [65M70](#) ([35B10](#) [35Q53](#) [65M12](#))
- [20] Aslani, G.; Momeni-Masuleh, S. H.; Malek, A.; Ghorbani, F. Bank efficiency evaluation using a neural network-DEA method. *Iran. J. Math. Sci. Inform.* 4 (2009), no. 2, 33-48, 87, [90C08](#) ([91B06](#) [91C20](#) [92B20](#))
- [19] Shekari Beidokhti, R.; Malek, A. Solving initial-boundary value problems for systems of partial differential equations using neural networks and optimization techniques. *J. Franklin Inst.* 346 (2009), no. 9, 898-913, [65M99](#)
- [18] Heidari, Hanif; Malek, Alaeddin Null boundary controllability for hyperdiffusion equation. *Int. J. Appl. Math.* 22 (2009), no. 4, 615-626, [93B05](#) ([35G05](#) [93C20](#))
- [17] Mohammadi, Abumoslem; Malek, Alaeddin Stable non-standard implicit finite difference schemes for non-linear heat transfer in a thin finite rod. *J. Difference Equ. Appl.* 15 (2009), no. 7, 719-728. (Reviewer: Reinhard Redlinger), [80M20](#) ([65M06](#))
- [16] Vaissmoradi, N.; Malek, A.; Momeni-Masuleh, S. H. Error analysis and applications of the Fourier-Galerkin Runge-Kutta schemes for high-order stiff PDEs. *J. Comput. Appl. Math.* 231 (2009), no. 1, 124-133. (Reviewer: Mohammad Asadzadeh), [65M70](#)
- [15] Vaissmoradi, N.; Malek, A.; Momeni-Masuleh, S. H. A novel hybrid scheme for solving stiff nonlinear partial differential equations. *Int. J. Appl. Math.* 22 (2009), no. 2, 275-286, [65M70](#) ([35Q53](#))
- [14] Malek, Alaeddin; Momeni-Masuleh, Sayed Hodjatollah A mixed collocation-finite difference method for 3D microscopic heat transport problems. *J. Comput. Appl. Math.* 217 (2008), no. 1, 137-147. (Reviewer: Stéphane Labbé), [65M70](#) ([65M06](#) [80M20](#))
- [13] Yashtini, M.; Malek, A. A discrete-time neural network for solving nonlinear convex problems with hybrid constraints. *Appl. Math. Comput.* 195 (2008), no. 2, 576-584, [90C30](#)
- [12] Tabatabaei, S. Amir Hossein A. E.; Malek, Alaeddin; Shakour, Elham Numerical solution for the nonlinear eigenvalue problems in bifurcation points. *Appl. Math. Comput.* 195 (2008), no. 2, 397-401, [65N25](#)
- [11] Malek, A.; Alipour, M. Numerical solution for linear and quadratic programming problems using a recurrent neural network. *Appl. Math. Comput.* 192 (2007), no. 1, 27-39, [90C20](#) ([65K05](#))
- [10] Momeni-Masuleh, S. H.; Malek, A. Hybrid pseudospectral-finite difference method for solving a 3D heat conduction equation in a submicroscale thin film. *Numer. Methods Partial Differential Equations* 23 (2007), no. 5, 1139-1148, [80M20](#) ([65M06](#))
- [9] Yashtini, M.; Malek, A. Solving complementarity and variational inequalities problems using neural networks. *Appl. Math. Comput.* 190 (2007), no. 1, 216-230, [90C33](#) ([49J40](#))
- [8] Ghasabi-Oskoei, H.; Malek, A.; Ahmadi, A. Novel artificial neural network with simulation

- aspects for solving linear and quadratic programming problems. *Comput. Math. Appl.*53 (2007), no. 9, 1439-1454, [90C22 \(90C53\)](#)
- [7] Malek, A.; Shekari Beidokhti, R. Numerical solution for high order differential equations using a hybrid neural network–optimization method. *Appl. Math. Comput.*183 (2006), no. 1, 260-271, [62M45](#)
- [6] Malek, A.; Oskoei, H. G. Numerical solutions for constrained quadratic problems using high-performance neural networks. *Appl. Math. Comput.*169 (2005), no. 1, 451-471, [90C20](#)
- [5] Malek, A.; Yari, A. Primal-dual solution for the linear programming problems using neural networks. *Appl. Math. Comput.*167 (2005), no. 1, 198-211, [90C05 \(90C46\)](#)
- [4] Malek, Alaeddin; Naseri, Rasool A new fast algorithm based on Karmarkar's gradient projected method for solving linear programming problems. *Adv. Model. Optim.* 6 (2004), no. 2, 43-51 (electronic), [90C05](#)
- [3] Malek, Alaeddin Pseudospectral analysis for the solution of nonlinear partial differential equations. Proceedings of the Second World Congress of Nonlinear Analysts, Part 8 (Athens, 1996). *Nonlinear Anal.*30 (1997), no. 8, 4805-4809, [65N35](#)
- [2] Malek, Alaeddin; Phillips, Timothy N. Pseudospectral collocation methods for fourth-order differential equations. *IMA J. Numer. Anal.*15 (1995), no. 4, 523-553. (Reviewer: Katarina Surla), [65L10 \(65N35 76D05 76M25\)](#)
- [1] Phillips, Timothy N.; Malek, Alaeddin Multidomain collocation methods for the stream function formulation of the Navier-Stokes equations. *SIAM J. Sci. Comput.*16 (1995), no. 4, 773-797. (Reviewer: D. M. Sloan), [76M25 \(65N35 76D05\)](#)

Dr. Alaeddin Malek Book Chapters

- [1] Chapter 12 of the book **Recurrent Neural Networks** Edited by Xiaolin Hu and P. Balasubramaniam, InTech, 2008.
[Applications of Recurrent Neural Networks to Optimization Problems](#)
- [2] Chapter 8 of the book **Heat Transfer - Mathematical Modelling, Numerical Methods and Information Technology**, Edited by Aziz Belmiloudi, InTech, 2011.
[Applications of Nonstandard Finite Difference Methods to Nonlinear Heat Transfer Problems](#)

Dr. Alaeddin Malek Technical Reports

- [1] Alaeddin Malek and Timothy N. Phillips

Department of Mathematics, University of Wales, Aberystwyth SY23 3BZ, United Kingdom
[Pseudospectral Collocation Methods for Fourth Order Differential Equations](#)
Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research
Center, Hampton, VA 23681-0001, 1994, 35 Pages
www.cs.odu.edu/~mln/ltrs-pdfs/icase-1994-35.pdf

[2] Alaeddin Malek and Maryam Yashtini
Department of Applied Mathematics, Faculty of Mathematical Sciences, Tarbiat Modares
University, P.O. Box 14115-134, Tehran, Iran
[A Neural Network Model for Solving Nonlinear Optimization Problem with Real-Time
Applications](#)
Advances in Neural Networks-ISNN, Springer-Verlag Berlin Heidelberg 2009,
Edited by Wen Yu, Haibo He, Nian Zhang

[3] Hanif Heidari, Hans Zwart and Alaeddin Malek
[Controllability and Stability of 3D Heat Conduction Equation in a Submicroscale Thin
Film,](#)
University of Twente, The Netherlands, ISSN 1874-4850, February 5, 2010
