

Curriculum Vitae

Personal details

Name: Kassem Mustapha

Date of birth: 10/7/1976

Languages: Arabic and English

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Address: King Fahd University of Petroleum and Minerals (KFUPM)

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Education

- 2004 Completed a PhD degree in applied mathematics at the University of New South Wales (UNSW), Thesis title: Analysis of fully discrete finite element methods with quadrature for second order nonlinear parabolic and hyperbolic problems, Supervisors: Professors M. Ganesh and I. H. Sloan
- 2001 Completed a Master of Science and Technology in Mathematics at the UNSW, Thesis title: Computational schemes for some boundary value problems. Supervisor: Professor M. Ganesh
- 1999 Completed a Bachelor Degree in pure mathematics at the Lebanese University (4 years full time)

Honors and Awards

- PhD Scholarship from the School of Mathematics and Statistics, UNSW, 2001-2004
- T. M. Cherry Prize for the best PhD student presentation at the Australian and New Zealand Industrial and Applied Mathematics conference, 2004

Employment history

- Part time teaching, School of Mathematics and Statistics at the UNSW and the university of Sydney, 2002–2006
- Research associate, School of Mathematics and Statistics, UNSW, 2004–2006
- Assistant professor at the Department of Mathematics and Statistics, KFUPM, 2006 to present

Teaching experience

- Calculus, and Linear and Vector Algebra (first year courses), School of Mathematics and Statistics, UNSW, 2002–2006
- Differential Calculus and Linear Algebra (first year courses), School of Mathematics and Statistics, The University of Sydney, 2003, 2005
- MATH202 (Elementary differential equation) and MATH260 (Differential equations and linear algebra) (second year courses), Department of Mathematics and Statistics, KFUPM, 2006–2007

Research experience

- Six months in 2000, research on proposing and analyzing a computer method for solving a class of ordinary differential equations as a part of the Master of Science and Technology degree in Mathematics. (School of Mathematics and Statistics, UNSW, Colleagues: Prof. M. Ganesh and Prof. R. Grigorieff)
- Three years (2001-2004, throughout my PhD period), research on proposing and analyzing several fully discrete methods for solving classes of elliptic, parabolic and hyperbolic problems. (School of Mathematics and Statistics, UNSW, Colleagues: Prof. B. Bialecki and Prof. M. Ganesh)
- February 2004 to February 2005, investigating the analytic solution of the helicoidal magnetohydrostatic surfaces. (School of Mathematics and Statistics, UNSW, Colleagues: Prof. C. Rogers and Prof. W. Schief)
- February 2005 to August 2006, research on the numerical methods for solving fractional differential and integral partial differential equations. (School of Mathematics and Statistics, UNSW, Colleagues: Dr. W. Mclean)
- September 2006 to present, research in the above areas with a number of colleagues from the international mathematical community. (Department of Mathematics and Statistics, KFUPM)

Research grants

- SABIC (2007-2008) Grant for the project: An efficient numerical solution for semi-linear fractional order partial differential equations
- KFUPM (2007-2008) Grant for the project: An ADI quadrature Petrov-Galerkin method for solving a class of time dependent problems

Refereed journal papers

- A second-order accurate numerical method for a semi-linear integro-differential equation with a weakly singular kernel, Submitted (with H. Mustapha)
- A quadrature finite element method for semi-linear second order hyperbolic problems, To appear in Numer. Meth. PDEs. (with H. Mustapha)
- A new approach to simulating flow in discrete fracture networks with an optimised mesh, SIAM J. Sci. Comp. 29 (2007) 1439–1459, (with H. Mustapha)
- A fully discrete H^1 -Galerkin method with quadrature for nonlinear parabolic equations problems, Numer. Algorithms, 43 (2007) 355–383, (with M. Ganesh)
- A second-order accurate numerical method for a fractional wave equation, Numer. Math., 105 (2007) 481-510, (with W. Mclean)
- A Petrov-Galerkin method with quadrature for semilinear second-order hyperbolic problems, Numer. Meth. PDEs., 22 (2006) 1052-1069, (B. Bialecki and M. Ganesh)
- A Crank–Nicolson and ADI Galerkin method with quadrature for hyperbolic problems, Numer. Meth. PDEs., 21 (2005), 57-79, (with M. Ganesh)
- A Crank–Nicolson Petrov-Galerkin method with quadrature for semilinear parabolic problems, Numer. Meth. PDEs., 21 (2005), 918-937, (with B. Bialecki and M. Ganesh)

- Discrete Petrov-Galerkin scheme for boundary value differential and integral problems: Theory and Application, *Math. Comp. and Model.*, 40 (2004), 1323–1334, (with M. Ganesh and R. Grigorieff)
- A Petrov- Galerkin method with quadrature for elliptic boundary value problems, *IMA, J. Numer. Anal.*, 24 (2004), 157-177, (with B. Bialecki and M. Ganesh)
- A diffusion-modified quadrature FEM for non-linear reaction diffusion equations, *Aust. NZ. Indus. Appl. Math. (ANZIAM) J.*, 45 (2004), 486-503, (with M. Ganesh)

Refereed conference proceedings

- A fully discrete ADI method for a class of hyperbolic problems in three dimensions, Third International Workshop on Scientific Computing and Applications (SCA03) conference proceedings, (2003) 159-170, (with M. Ganesh)

Papers in preparation

- Discontinuous Galerkin method for an evolution equation with a weakly singular positive type memory (with W. Mclean)
- An ADI Petrov-Galerkin method with quadrature for parabolic problems (with B. Bialecki and M. Ganesh)
- A Laplace-Modified fully discrete method for nonlinear hyperbolic problems (M. Ganesh)
- Nested helicoidal flux surface in magnetohydrostatics. Generation via soliton theory (with W. Schief)
- Petrov Galerkin method with and without quadrature for weakly singular volterra integro-differential equations.

Talks and participation at conferences

- Australian mathematical society conference, Australia, 2001
- Summer school in computational mathematics, Australia, 2002
- Computational Techniques and Applications Conference, Australia, 2003
- International Congress on Industrial and Applied Mathematics, Australia, 2003
- Australian and New Zealand Industrial and Applied Mathematics conference, Australia, 2004
- International conference on asymptotic theories and Painleve equations, France, 2004
- Computational Techniques and Applications conference, Australia, 2004
- Workshop on High-dimensional Approximation, Australia, 2005
- The Mathematics of Finite Elements and Applications, United Kingdom, 2006

Referees

- Professor B. Bialecki,
Phone: (303) 273 3863
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School of Mines, Colorado, USA,
- Professor M. Ganesh,
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The University of New South Wales, Australia.
- Scientia Professor I. H. Sloan,
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