

CURRICULUM VITAE

PART I: PERSONAL AND CONTACT INFORMATION

Bio

Name: Murtazo Nazarov

Contacts

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PART II: EDUCATION AND EMPLOYMENT

Employment

2018 – present Associate Professor, Division of Scientific Computing Department of Information Technology Uppsala University, Sweden.

2014 – 2018 Assistant Professor, Division of Scientific Computing Department of Information Technology Uppsala University, Sweden.

2011 – 2014 Visiting Assistant Professor, Department of Mathematics, Texas A&M University, USA.

2011 Visiting Researcher/Lecturer, KTH, Sweden.

2006 – 2011 Doctoral Student, KTH, Sweden.

2002 – 2004 Postgraduate Student, KhSU, Tajikistan.

Education

Higher education qualification

2006 M.Sc. in Scientific Computing, KTH, Sweden.
Thesis title (Computational Fluid Dynamics): *Phase field simulations*.
Advisor: Prof. Gustav Amberg (email: gustava@mech.kth.se)
Grade average: 4.95/5

2004 Postgraduate Studies in Mathematics, KhSU, Tajikistan
Advisors: Prof. Naimov A.N. (email: nan67@rambler.ru), Prof. Muhamadiev E.M. (email: emuhamadiev@rambler.ru), VSTU, Russia

2002 M.Sc. in Mathematics, KhSU, Tajikistan
Thesis title (Functional Analysis): *The theorem of Beer-Hausdorff and it's applications*.
Advisor: Prof. Naimov A.N.
Grade average: 5/5, diploma with honors

Doctoral degree

2011 PhD in Applied and Computational Mathematics, KTH, Sweden.
Dissertation title: *Adaptive high order stabilized FEM for compressible turbulent flow*.
Advisors: Prof. Johan Hoffman (email: jhoffman@kth.se), Prof. Anders Szepessy (email: szepessy@kth.se)

2009 Degree of Licentiate in Scientific Computing, KTH, Sweden.
Dissertation title: *An adaptive finite element method for turbulent compressible flows*.
Advisor: Prof. Johan Hoffman (email: jhoffman@kth.se)

Postdoctoral position

2011-2014 Postdoc in the Department of Mathematics, Texas A&M University, Texas, USA
Research interest: *Positivity preserving stabilized finite element methods*.
Mentor: Prof. Jean-Luc Guermond (email: guermond@math.tamu.edu)

Docentship

2017, March 29 Docent in Scientific Computing with a specialization in Numerical Analysis at the Faculty of Science and Technology, Uppsala University, Sweden.

Affiliations and relations

UU Division of Scientific Computing, Department of Information Technology, Uppsala University
(<http://www.it.uu.se>)

Unicorn Open source computational toolbox in the FEniCS project
(www.fenicsproject.org)

Supervision of PhD students

2018 – present Regina Marie Kelly, Uppsala University. (principal supervisor)
Thesis title: *Finite element simulations of micromagnetism*.

2015 – present Gustav Ludvigsson, Uppsala University. (co-advisor)
Thesis title: *Cut finite element methods for multiphase problems*.

2015 – present Simone Sticko, Uppsala University. (co-advisor)
Thesis title: *Numerical methods for wave propagation*.

Appointments

2017, Jun Thesis evaluation committee to a PhD defense of Siyang Wang, Uppsala University.

2017, Dec Thesis evaluation committee to a PhD defense of Viktor Linders, Linköping University.

2016 Co-organizer, a member in scientific board of the first scientific computing conference in Sweden, Uppsala University.

Awards

2014 – 2017 Esseens stipendium, travel grant from Uppsala University (116 000 SEK in total)

2016 TUFF teaching development grant, Co-PI. Project title: “Studentfokuserad undervisning genom holistiskt formulerade designprojekt”. (115 663 SEK)

2011 – 2013 KAUST fellow, Institute for Applied Mathematics and Computational Science,

Texas A&M University, USA.

- 2009, 2011 Knut and Alice Wallenberg travel grant (26 000 SEK)
- 2008 Congress Scholarships (WCCM8-ECCOMAS2008)
- 2004 Swedish Institute (20 months scholarship to study at KTH, 154 000 SEK)
- 2001 The Best in Students Scientific Contribution Contest, KhSU, Tajikistan
- 1997 Winner of National Mathematics Olympiad among Gymnasium, Colleges, Secondary Schools and High Schools, Tajikistan, 1st place, gold medal
- 1996 – 1995 Winner of Regional Olympiad on Mathematics among Gymnasium, Colleges, Secondary Schools and High Schools, 1st place

PART III: TEACHING

Teaching experiences

Courses taught at Uppsala University

- 2018 Advanced Numerical Methods, 1TD050 (*master level*).
- 2018 Scientific Computing III, 1TD397 (*advanced undergraduate and master level*).
- 2017 Applied finite element methods, 1TD056 (*advanced undergraduate and master level*).
- 2016 Applied finite element methods, 1TD056 (*advanced undergraduate and master level*).
- 2015 Finite element methods, 1TD253 (*advanced undergraduate and master level*).
- 2014 Finite element methods, 1TD253 (*advanced undergraduate and master level*).

Courses taught at Texas A&M University

- 2014 Topics in Applied Mathematics I, Math 311-200 (*undergraduate level*).
- 2014 Ordinary Differential Equations, MATH-308-503 (*undergraduate level*).

Courses taught at KTH

- 2013 Ordinary Differential Equations, MATH-308-512 (*undergraduate level*).
- 2013 Numerical Methods, MATH-417 (*undergraduate level*).
- 2011 Finite Element Methods, DN2260 (*master level*).
- 2010 Finite Element Methods, DN2260 (*master level*).

As a teaching assistant

- 2007 – 2009 Finite Element Methods (*master level*), KTH.
- 2008 – 2009 Advanced Computation in Fluid Mechanics (*master/PhD level*), KTH.
- 2006 – 2008 Mathematical Models, Analysis and Simulation (*master level*), KTH.
- 2006 – 2009 Numerical method and basic programming (*undergraduate level*), KTH.

Other activities

- 2016 (Co-organizer) First scientific computing conference in Sweden, Uppsala University.
- 2012 (Co-organizer) Weekly seminar for study Besov spaces, Littlewood-Paley theory, and paradiifferential calculus, Texas A&M University, USA
- Since 2006 Developer of open-source computational toolbox Unicorn (www.fenicsproject.org).
- 1997 – 1999 (Co-organizer) Weekly seminar on solving problems from mathematical analysis and differential equation, KhSU, Tajikistan.

PART IV: RESEARCH

Research interests

- Numerical analysis of partial differential equations in particular conservation laws and hyperbolic equations.
- Development and designing high order stabilized methods for conforming finite elements.
- Construction, analysis and implementation of adaptive methods for turbulent flows.
- Mathematical analysis of Implicit Large Eddy Simulations, ILES.
- Numerical methods for compressible and incompressible Navier-Stokes and Euler equations.
- Parabolic regularizations, maximum principle preserving schemes, entropy viscosity.

Invited seminar presentations

- Mar 2017 *Finite element methods for flow problems, 45-min.*
Docent-seminar, division of Scientific Computing, University of Uppsala, Sweden
- Sep 2014 *Maximum principle preserving continuous finite element schemes for scalar conservation equations, 45-min.*
TDB-seminar, division of Scientific Computing, University of Uppsala, Sweden
- July 2014 *Maximum principle preserving continuous finite element schemes, 50-min.*
Department of Mathematics, University of Maryland, Maryland, USA
- May 2014 *Maximum-principle preserving continuous finite element schemes for scalar conservation equations, 50-min.*
Department of Mathematics, Florida Institute of Technology, FIT, Melbourne, Florida, USA
- Feb 2014 *A second-order maximum-principle preserving explicit continuous finite element method for scalar conservation equations, 60-min.*
Institute for Computational Engineering & Sciences, University of Texas at Austin, TX, USA
- Feb 2014 *A second-order maximum-principle preserving explicit continuous finite element method for scalar conservation equations, 60-min.*
Lawrence Livermore National Laboratory, LLNL, Livermore, CA, USA

- Oct 2013 *A maximum-principle preserving continuous finite element method for scalar conservation equations, 45-min.*
Department of Mathematics, KTH, Sweden
- Apr 2012 *Adaptive finite element methods for compressible flows using high-order stabilization, 60-min.*
Argonne National Laboratory, Mathematics and Computer Science Division, ANL, Lemont, IL, USA
- Sep 2011 *Residual Based Artificial Viscosity for Compressible Flows, 45-min.*
TDB-seminar, division of Scientific Computing, University of Uppsala, Sweden
- Oct 2010 *Adaptive Entropy Viscosity Method for Compressible Euler Equations, 45-min.*
Computational Science and Engineering Centre (KCSE), KTH, Sweden
- Sep 2008 *A General Galerkin Finite Element Method for the Compressible Euler Equations, 45-min.*
Linné Flow Center, KTH, Sweden
- Jan 2007 *Finite Element Methods for Transport Problems, 3x45-min.*
Department of Mathematics, VSTU, Russia

Invited conference presentations

- Sep 2017 *Invariant domain preserving continuous finite element methods for system of conservation laws, 30-min.*
ENUMATH'17, September 25-29, 2017, Voss, Norway.
- Feb 2016 *Towards invariant domain preserving high order continuous finite elements for conservation laws, 30-min.*
27th Nordic Congress of Mathematicians. Stockholm, Sweden
- June 2015 *Nonlinear Stabilization Techniques for Finite Element Approximations of Fluid Problems, 30-min.*
Platform for Advanced Scientific Computing, PASC15, ETH, Switzerland
- June 2015 *A Conservative and Grid Adaptive Stabilization Scheme for Spectral Elements Based on a Dynamic SGS Model for LES. Application in Numerical Weather Prediction 30-min.*
Platform for Advanced Scientific Computing, PASC15, ETH, Switzerland
- Nov 2014 *A second-order maximum principle preserving continuous finite element method for nonlinear scalar conservation laws, 30-min.*
CJ70 A Scientific Conference in Honour of Professor Claes Johnson, Gothenburg, Sweden
- Jun 2014 *Maximum-principle preserving continuous finite element schemes for scalar conservation equations, 30-min.*
International Conference in Khujand State University, Khujand, Tajikistan
- Feb 2013 *Entropy Stability and High-order Approximation of the Compressible Euler Equations, 30-min.*
SIAM Conference on Computational Science and Engineering, SIAM-CSE'13 Boston, Massachusetts, USA
- Apr 2012 *A Posteriori Error Estimation for Compressible Flows using Entropy Viscosity, 30-min.*
The Eighth International Conference on Scientific Computing and Applications SCA2012, University of Nevada, Las Vegas, USA

- Jun 2011 *Stabilization and Adaptivity of Finite Element Methods for Compressible Flows, 30-min.*
Institute of Mathematics of the Tajik Academy of Science, Dushanbe, Tajikistan
- Jun 2009 *An Adaptive General Galerkin Finite Element Method for the Turbulent Compressible flows, 30-min.*
ENUMATH'09, Uppsala University, Sweden

Contributed conference presentations

- Mar 2014 *A second-order maximum-principle preserving FEM for scalar conservation equations, 15-min.*
Finite Element Rodeo'14, UT Austin, USA
- Mar 2013 *Entropy Stability and High-order Approximation of the Compressible Euler Equations 15-min.*
Finite Element Circus & Rodeo'13, LSU, USA
- Mar 2011 *Adaptive Finite Element Methods for Compressible Flows, 20-min.*
FEF'11, Munich, Germany
- Mar 2010 *An Adaptive FEM for Inviscid Compressible Flow, 15-min.*
Finite Element Rodeo'10, SMU, USA
- Jun 2009 *An Adaptive G2 Method for the Compressible Euler Equations, 20-min.*
FEniCS'09, Simulla Laboratory, Norway
- Apr 2009 *An Adaptive General Galerkin Finite Element Method for the Turbulent Compressible Flows, 25-min.*
FEF'09, Chuo University, Tokio, Japan
- Jun 2008 *Adaptive Computation of Turbulent Compressible Flow using a General Galerkin Method, 20-min.*
World Congress in Computational Mechanics, WCCM'08, ECCOMAS'08, Venice, Italy
- Apr 2008 *Vector Boundary Conditions in Unicorn and their applications in Compressible and Incompressible Flows, 20-min.*
FEniCS'08, Louisiana State University, USA

Conference contributions

- Jun 2011 Institute of Mathematics of the Tajik Academy of Science. Conference in honor of Prof. E.M. Muhamadiev.
- Jun 2009 5th International Scientific-Technical Conference. VSTU, Russia.

Research Experience/Visits

- May 2017 Department of Computer Science, University of Illinois at Urbana-Champaign, Illinois, USA. Visiting Prof. Paul Fischer.
- Mar-May 2017 Department of Mathematics, Texas A&M University, TX, USA. Visiting Prof. Jean-Luc Guermond and Prof. Bojan Popov.
- Feb, May 2016 Department of Mathematics, Texas A&M University, TX, USA. Visiting Prof. Jean-Luc Guermond and Prof. Bojan Popov.
- Feb 2014 Institute for Computational Engineering & Sciences, University of Texas at Austin, TX, USA. Visiting Prof. Ivo Babushka.

May 2013 SRI - Center for Uncertainty Quantification in Computational Science & Engineering, KAUST, Thuwal, Saudi Arabia. Visiting Prof. Raul Tempone

Apr 2012 Mathematics and Computer Science Division, ANL, Lemont, IL, USA. Visiting Paul Fischer

Dec 2010 Department of Mathematics, Texas A&M University, USA. Visiting Prof. J-L. Guermond

Feb – May 2010 Department of Mathematics, Texas A&M University, USA. Visiting Prof. J-L. Guermond

Dec 2006 Department of Mathematics, VSTU, Russia. Visiting Prof. E.M. Muhamadiev