Yerlan Amanbek

CONTACT

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3353 Lake Austin Blvd, apt. D
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TECHNICAL SKILLS

Numerical modeling: domain decomposition, discretization schemes, multiscale methods, a posteriori and a priorri error analysis, robust and efficient solution algorithms.

PROFICIENCY

Programming: C/C++, VBA, Pascal.
Reservoir Simulators: IPARS, CMG.
Scientific Toolboxes: Matlab, LaTeX, Mathematica, SPSS.
FEM Library: dealII, http://dealii.org.
Others: HTML, Joomla, Dreamweaver, Apache.

EDUCATION

Ph.D., Computational Science, Engineering & Math, **UT Austin**, USA. 2013-2018
Thesis: *Modeling subsurface flow and transport using the Enhanced Velocity Mixed FEM and Numerical Homogenization*
Advisor: Dr. Mary F. Wheeler.
Adaptive methods using upscaling and domain decomposition for flow & transport. A *priori* and a *posteriori* error analysis for EVMFEM theoretically and numerically.

M.Sc., IT, **Nanyang Technological University**, Singapore. 2007-2009
Thesis: *Adoption of e-Government in the Republic of Kazakhstan*
Advisor: Dr. M. Tan.
We conducted quantitative research through the web-based survey to get the perception towards the portal. The Technology Acceptance Model is used as a model to measure attitude toward technology adoption in multiple domains. Data analysis were performed by Statistical Tools(SPSS).

B. Sc. with honors, Applied Mathematics and Computer Science, **Al-Farabi Kazakh National University**, Almaty, Kazakhstan. 2002 - 2006
Diplom work: *A modified incompressible Novier-Stockes equations in 2D*
Advisor: Dr. N. Danayev

High school with honors, **O.Zhautykov Republican Physics and Mathematics school for gifted students**, Almaty, Kazakhstan. 1999 - 2002

AWARDS

Texas Applied Math & Eng Symposium (TAMES) **Poster Award**, USA 2017

Research Experience Carbon Sequestration Program Award, USA 2017

SIAM Travel Award, USA 2017

CIME-Foundation and CIRM Grant, Italy 2016

Talap Scholarship, Kazakhstan 2013

Presidential Bolashak Scholarship, Kazakhstan 2007

Honorable Mention North-Eastern European Collegiate Programming Contest, Tashkent, Uzbekistan 2005

First place on the Zhautykov Town Math Olympiad 2001

Winner awards on International Mathematical Olympiads for Tournament of Towns 2000-2002

Winner awards on Kazakhstan Republican Mathematical Olympiads 2000-2002

Team Leader

Leader of the Nazarbayev University Team at 19th & 20th International Mathematics Competition for University Students, Blagoevgrad, Bulgaria 2012, 2013

Jury at 51st International Mathematical Olympiad, Astana, Kazakhstan 2010

Leader of the Kazakhstan Team at 10th Junior Balkan Mathematical Olympiad, Chisinau, Republic of Moldova 2006

Team Leader at the 2^{nd} International Zhautykov Olympiad on Mathematics and Physics, Almaty, Kazakhstan 2006

Publications

1. Amanbek, Y., Singh, G., and Wheeler, M. F. "Adaptive Numerical Homogenization for Upscaling Single Phase Flow and Transport", ICES Report, 12 (17). (submitted)
2. Singh, G., Amanbek, Y. and Wheeler, M. F. "Adaptive Homogenization for Upscaling Heterogeneous Porous Medium" SPE-187113-MS, *SPE Annual Technical Conference and Exhibition*, Oct 9-11, 2017, San Antonio, Texas. https://doi.org/10.2118/187113-MS
3. Amanbek, Y., Singh, G., Pencheva, G. and Wheeler, M.F. "A posteriori error estimates for Enhanced Velocity MixedFEM for flow problems in heterogeneous porous media."(in preparation)

Conference & Invited Talks

1. G. Singh, Y. Amanbek and M. F. Wheeler, *Adaptive Homogenization for Upscaling Heterogeneous Porous Medium*, SPE ATCE, Oct 9-11, 2017, San Antonio, Texas.
2. Y. Amanbek, G. Singh, G. Pencheva and M. F. Wheeler, *Adaptive multiscale method on flow and reactive transport using numerical homogenization and Enhanced Velocity Mixed FEM*, Texas Applied Mathematics and Engineering Symposium, September 23-25, 2017, The University of Texas at Austin, Austin, Texas.
3. Y. Amanbek, G. Singh and M. F. Wheeler, *Modeling flow and transport using Enhanced Velocity Mixed FEM and Numerical Homogenization*, Finite Element Rodeo, March 3-4, 2017, University of Houston, Houston, Texas.
4. Y. Amanbek, G. Singh and M. F. Wheeler, *Multiscale Methods for Flow and Transport in Porous Media*, SIAM Conference on Computational Science and Engineering (CSE17), February 26-March 3, 2017, Atlanta, Georgia.
5. G. Singh, G. Pencheva, A. Venkatraman, Y. Amanbek, and M. F. Wheeler, *A Fully Implicit Framework for Coupled Reactive Flow and Transport*, 26th Annual Industrial Affiliates Meeting, Center for Subsurface Modeling, November 1-2, 2016, The University of Texas at Austin, Austin, Texas.
6. G. Singh, Y. Amanbek, and M. F. Wheeler, *Upscaling Reservoir Properties using Single Well Tracer Tests*, Computational Methods in Water Resources. June, 2016, University of Toronto, Canada.
7. Y. Amanbek, G. Singh and M. F. Wheeler *Upscaling Flow and Transport using Two-Scale Homogenization*, Finite Element Rodeo, March 4-5, 2016, Texas A&M, College Station, Texas.
8. G. Singh, Y. Amanbek, M. F. Wheeler, *Addressing Challenges in Flow Modeling for Fractured Reservoirs*, 25^{th} Annual Industrial Affiliates Meeting, Center for Subsurface Modeling, November 3-4, 2015, The University of Texas at Austin, Austin, Texas.
9. Y. Amanbek, Sh. Musiralieva, *RSA ALGORITHM. CRYPTO ANALYSIS.* 60^{th} Scientific Conference , April, 2006, Al-Farabi Kazakh National University, Almaty, Kazakhstan.

Research Posters

1. "Adaptive Numerical Homogenization for Upscaling Single Phase Flow and Transport", Y. Amanbek, G. Singh and M. F. Wheeler, Texas Applied Mathematics and Engineering Symposium (TAMES), September 21-23, 2017, Austin, Texas.
2. "Selective Time-stepping adaptivity for Non-Linear Reactive Transport Problems", Y. Amanbek, G. Singh and M. F. Wheeler, SIAM Conference on Computational Science and Engineering (CSE17), February 26-March 3, 2017, Atlanta, Georgia.
3. "Adaptive Time-stepping for Non-Linear Reactive Transport Problems", Y. Amanbek, G. Singh and M. F. Wheeler, 26^{th} Annual Industrial Affiliates Meeting, November 1-2, 2016, Center for Subsurface Modeling, The University of Texas at Austin, Austin, Texas.
4. "Upscaling Reactive Flow and Transport using Two-Scale Homogenization", Y. Amanbek, G. Singh, C. J. van Duijn, and M. F. Wheeler, 25^{th} Annual Industrial Affiliates Meeting, November 3-4, 2015, Center for Subsurface Modeling, The University of Texas at Austin, Austin, Texas.

Participated Conferences, Workshops, Summer School

Fall 2017 Teaching Preparation Series, Faculty Innovation Center, The University of Texas at Austin, Austin, USA.

Research Experience in Carbon Sequestration (RECS) training program on *"Carbon Capture, Utilization and Storage (CCUS)"*, July 22-29, 2017, Alabama, USA.

8^{th} annual conference on *"Scientific Software Days Conference"*, April 27-28, 2017, Austin, USA.

ICES workshop on *"Advances in Computational Sciences and Engineering: A conference in honor of the 80*$^{\text{th}}$ *birthday of Prof. J. Tinsley Oden"*, March 20-21, 2017, Austin, USA.

SPE-SIAM workshop on *"Advances in Data-Driven Analytics Applications: From Methodology to Technology"*, December 9, 2016, Houston, USA.

CIME-CIRM Course on *"New Trends in non-Newtonian Fluid Mechanics and Complex Flows"*, August 29-September 2, 2016, Levico Terme, Italy.

Summer Course on *"Mathematical and Algorithmic Aspects of Uncertainty Quantification"*, July 28 - August 08, 2014, ICES, The University of Texas at Austin, Texas.

25^{th} International Conference on Parallel Computational Fluid Dynamics, May 2013, Changsha, Hunan, China.

Basic Actuarial Training Program : "Theory of Interest Rates and Random Processes in the Insurance", March-April 2003, Almaty, Kazakhstan.

Professional Experience

Center for Subsurface Modeling, ICES 2014 to 2018

Research Assistant

- Developed flow and transport model using advanced temporal and spatial discretization.

Nazarbayev University(NU) Aug 2011 to Aug 2013

Teacher Assistant in Math Department, School of Technology and Science

- Lectured Calculus 1
- Graded, lead recitation of Calculus 1-3, Discrete Mathematics.
- Involved to Math Club activities.
- Established and prepared NU Math Team for International Math Competitions.

Nazarbayev University April 2011 to Aug 2011

Lab Assistant, Center for Energy Research, Astana, Kazakhstan.

- Developed and implemented the website.
- Developed and implemented the evaluation system of employers.
- Involved to the research activities.

Kazakhtelecom Dec 2009 to Aug 2010

Department Information System

- E-school and learning managment systems for high schools.

Nanyang Technological University Jun 2008 to Jul 2008

Research Assistant, School of Communication and Information, Singapore.

- Developed and implemented Webplatform for local publications.

- Modification and input data

Bank Centercredit Aug 2006 to Sep 2007

Specialist, Center Management Resource Treasure Department, Almaty, Kazakhstan.

- Implemented scripts in VBA
- Optimized the system to authomize process related to Database.

High Schools Sep 2003 to May 2006

Teacher in Advanced Math Courses, Almaty, Kazakhstan.

- Prepared students for Internatinal/National Math Olympiads,
- Lead problem solving sessions.

LANGUAGES

Kazakh
English
Russian

INTERESTS AND HOBBIES

Sport: Swimming, Hiking, Volleyball, Soccer.
Astana Toastmasters Club