Hatef Dastour **Curriculum Vitae**

CONTACT INFORMATION

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RESEARCH INTERESTS

Numerical solution of partial differential equations, optimal finite differences methods, numerical solution of the wave equation, numerical solution of inverse heat conduction problems, regularization methods

EDUCATION

- Ph.D., University of Calgary, Canada,
  Mathematics and Statistics, January 2016 - Winter 2020 (Expected),
  Thesis topic: *Computational Methods for Solving Wave Equation Inverse Problem*,
  Advisor: Dr. Wenyuan Liao,

- M.S., Damghan University, Iran,
  Applied Mathematics, September 2010 - September 2012,
  Thesis topic: *The Application of Mollification Method in solving a number of Inverse Heat Conduction Problems*,
  Advisor: Dr. Morteza Garshasbi,

- B.S., Payam Noor University, Iran,
  Applied Mathematics, September 2006 - July 2010.

AWARDS

Student Awards — University of Calgary, Department of Mathematics and Statistics
- PIMS Doctoral Recruitment Scholarship 2015–2016
- Eric Milner Graduate Scholarship 2016–2017
- 2017 Alberta Innovates Graduate Student Scholarship 2017–2019

Travel Awards
- 2016 CMS Summer Meeting, University of Alberta, Edmonton, AB June 2016
- 2016 Graduate Mathematical Modelling in Industry Workshop, Vancouver, BC August 2016
- 2016 Industrial Problem Solving Workshop, Toronto, ON August 2016

COMPUTER SKILLS

- Proficiency with computer programming including MATLAB, Python, R, Julia Programming, and others.
- Proficiency with office applications, such as Microsoft Office, LaTeX editors, and more.
- Proficiency with advanced graphical applications, such as Adobe Photoshop, 3D Studio Max, Blender, and more.

CERTIFICATIONS

- Recognition of outstanding efforts and accomplishments on behalf of the *SIAM Chapter at the University of Calgary, Canada*.
- *Programming for Everybody (Getting Started with Python)* - an online non-credit course authorized by University of Michigan.
- Recognition of the Completion of the *Instructional Skills Workshop* (August 30-September 2, 2016).
- Certificate of Appreciation for having made valuable contributions to the *June 2016 Convocation Ceremonies*.

Teaching Experience

Instructor:

- MATH 211 - Linear Methods I - Spring 2019
- MATH 211 - Linear Methods I - Summer 2018

Graduate Student Instruction Training Program September 2017 to December 2017

Department of Mathematics and Statistics, University of Calgary,

- MATH 275 - Calculus for Engineers and Scientists

The Program Supervisor: Dr. Yuriy Zinchenko.

Graduate Assistant: Teaching January 2016 to Present

Department of Mathematics and Statistics, University of Calgary,

- Introductory Calculus (MATH 249), University Calculus I (MATH 265), Calculus for Engineers and Scientists (MATH 275), Multivariable Calculus for Engineers (MATH 277), Differential Equations for Engineers and Scientists (MATH 375), Numerical Analysis I (MATH 391), Numerical Analysis I (AMAT 491) and Numerical Analysis II (AMAT 493).

Mathematics Tutor October 2010 to August 2015

Self-employed private tutor.

- Teaching various topics in Differential Equations, Calculus, etc.

Research Experience

Graduate Research Assistant January 2016 to September 2016

Department of Mathematics and Statistics, University of Calgary

Supervisor: Dr. Wenyuan Liao

- Investigating the application of Marching scheme and Mollification method to solve an inverse degenerate diffusion problem in petroleum reservoirs,
- Incorporating higher-order finite difference methods on the wave equation on inhomogeneous medium,
- Adjoint methods for solving seismic inverse problems.

Research Assistant February 2012 to May 2015

School of Mathematics, Iran University of Science and Technology

Supervisor: Dr. Morteza Garshasbi

- Incorporating Mollification method and Marching scheme to estimate unknown boundary functions in inverse heat conduction problems, moving boundary problems and inverse ablation-type moving boundary problems.

Graduate Research Assistant October 2010 to August 2012

School of Mathematics and Computer science, Damghan University

Supervisor: Dr. Morteza Garshasbi

- Investigating the application of Marching scheme and Mollification method for finding the stable numerical solution of a class of semi-linear Cauchy problems.

Journal Publications

1. **H. Dastour**, W. Liao, "A fourth-order optimal finite difference scheme for the helmholtz equation with PML" , *Computers & Mathematics with Applications*, Vol 78 (2019), pp 2147–2165.
2. W. Liao, P. Yong, **H. Dastour**, and J. Huang. "Efficient and accurate numerical simulation of acoustic wave propagation in a 2d heterogeneous" media. Applied Mathematics and Computation, Vol 321 (2018), pp 385-400.
3. M. Garshasbi, **H. Dastour**, "A mollified marching solution of an inverse ablation-type moving boundary problem", *Computational and Applied Mathematics*, Vol 35 (2016), No 1, pp 61-73.
4. M. Garshasbi, **H. Dastour**, "Estimation of unknown boundary functions in an inverse heat conduction problem using a mollified marching scheme", *Numerical Algorithms*, Vol 68 (2015), No 4, pp 769–790.

5. M. Garshasbi, **H. Dastour**, "Proportional Factors Estimation in an IHCP" *Journal of Hyperstructures*, Vol 3 (2014), No, pp 53-67.

6. M. Garshasbi, **H. Dastour** and M. Jalalvand "A Stable Numerical Solution of an Inverse Moving Boundary Problem of Heat Conduction Using Discrete Mollification Approach", *Journal of Advanced Mathematical Modeling (JAMM)*, Vol 2 (2012), No 1, pp 47-60.

7. M. Garshasbi, P. Reihani, **H. Dastour**, "A stable numerical solution of a class of semi-linear Cauchy problems", *Journal of Advanced Research in Dynamical & Control Systems*, Vol 4 (2012), No 3, pp 56-67.

Submitted Journal Publications

1. **H. Dastour**, W. Liao, "A fourth-order optimal finite difference scheme for the Helmholtz equation based on point-weighting", 2019. Submitted to an Elsevier journal.

2. **H. Dastour**, W. Liao, "An optimal 13-point finite difference scheme for the Helmholtz equation with PML", 2019. Submitted to a Springer journal.

Selected Presentations

1. H. Dastour, "Computational Methods for Solving Wave Equation Inverse Problem", Eric Milner Colloquium, University of Calgary, Calgary, AB, Canada, October 14, 2016 (Colloquium Presentation).

2. H. Dastour, "A stabilized marching scheme for solving the inverse problem of degenerate diffusion model", the Canadian Society of Applied and Industrial Mathematics (CAIMS 2016), University of Alberta, Edmonton, AB, Canada, June 28, 2016 (Conference Presentation).

3. H. Dastour, "A numerical estimation approach for an inverse heat conduction problem", 2016 CMS Summer Meeting, University of Alberta, Edmonton, AB, Canada, June 24, 2016 (Conference Presentation).

4. H. Dastour, "A Computational Method for Solving an Inverse Heat Conduction Problem", 2016 CMS Summer Meeting, University of Alberta, Edmonton, AB, Canada, June 25, 2016 (Conference Poster Presentation).

5. H. Dastour, "A mollified marching solution of an inverse degenerate diffusion problem in petroleum reservoir", Alberta Mathematics Dialogue 2016, Mount Royal University, Calgary, AB, Canada, April 29, 2016 (Conference Presentation).

Attended Workshops

1. 2016 Instructional Skill Workshop, Taylor Institute for Teaching and Learning - University of Calgary, Calgary, AB, Canada, August 30, 2016 - September 02, 2016,

2. 2016 Graduate Mathematical Modelling in Industry Workshop, University of British Columbia, Vancouver, BC, Canada, August 08, 2016 - August 13, 2016,
   - Project: *Modelling the performance of the rechargeable Li-Ion batteries*, By Dr. Brian Wetton,

3. 2016 Industrial Problem Solving Workshop, University of Toronto, Toronto, ON, Canada, August 15, 2016 - August 19, 2016,
   - Project: *How to Combine Two Relative Rankings of Credit Risk into One Ranking?*
     By Internal Ratings Management, Global Risk Management, Scotiabank.

VOLUNTEER ACTIVITIES

- Contribution to *2018 Industrial Problem Solving Workshop (IPSW)* Aug 19, 2018 - Aug 24, 2019.
- Serving on Mathematics and Statistics (MTST) Head Search Committee, March 2018,
- Instructor of *Programming Workshop* at *2017 CMS Math Camp (Alberta)*, University of Calgary, Canada, July 2017,
- Contribution to the June 2016 convocation ceremonies, University of Calgary, Canada, June 2016,
- The vice-president academic of Graduate University Mathematics Society (GUMS), University of Calgary September 2016-Present,
- The representative of graduate students of the Department of Mathematics and Statistics in the Graduate Committee of the department, University of Calgary October 2016-Present,
- The president of University of Calgary SIAM Student Chapter, University of Calgary, January 2017-Present,
- Organizer of *the University of Calgary Chapter of SIAM Biweekly Seminar Series* February 2017 - April 2018,
- Organizer of *Calgary Applied and Industrial Mathematical Sciences Conference* May 21, 2017 - May 22, 2017.

LANGUAGES

English and Persian

REFERENCES

References available upon request