Curriculum Vitae: Hatef Dastour, PhD

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Education

- Ph.D., Mathematics and Statistics,
  University of Calgary

  January 2016 - December 2019,
  Calgary, Canada,

- M.S., Applied Mathematics,
  Damghan University

  September 2010 - September 2012,
  Damghan, Iran,

- B.S., Applied Mathematics,
  Payame Noor University

  September 2006 - July 2010,
  Tehran, Iran,

Research Interests

Big data analysis, mathematical modeling, scientific computations, and numerical analysis

Working and Teaching Experience

- Research Associate — November 2021 - March 31, 2022,
  Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary, Alberta, Canada

  - Working on Alberta climate data and drawing compassion with other data-sets
  - Developed an algorithm for water surface dynamics of the lakes of Alberta with Earth observation data
  - Preparing and writing scientific papers
  - Analyzing various large data-sets for finding insights

- Data Scientist/Research Scientist — July 2020 - Present,
  Earth & Space Inc., Calgary, AB, Canada

  - Working on Alberta climate data and drawing compassion with other data-sets
  - Developed an algorithm for water surface dynamics of the lakes of Alberta with Earth observation data
  - Preparing and writing scientific papers
  - Developing machine learning and deep learning model for natural geo-phenomena
  - Analyzing various large data-sets for finding insights
  - Assisting in preparing bidding proposals.
  - Investigating and implementing various deep learning and computer vision tools for improving the currently available methods.
  - Providing data science-based consultations to clients and partner companies.

- Sessional Lecturer I/Tutorial instructor — August 2021 - Present,
  Faculty of Arts & Science, University of Lethbridge, Calgary, AB, Canada

  - Preparing and delivering of some sessions of MATH1510Y (Calculus for Management and Social Sciences) Lecture 01.
  - Preparing and delivering and grading of MATH1510Y Tutorial 01. The labs are focused on the usage of MS Excel and its application in business data analysis.

- Data Science Developer, Full-Time 📅 January 2020 - March 25, 2020,
  StellarAlgo Corp., Calgary, AB, Canada
  Due to the COVID19 pandemic, StellarAlgo terminated the contract of all of its Data Scientists on March 25, 2020.

  - Designing, developing, and refining predictive models for selected business verticals.
  - Discovering and communicating relevant insights to key stakeholders for smarter decision making.
  - To explore opportunities for combining existing and new data sources to discover insights.
  - Supporting requirements gathering and data engineering efforts related to building analytics data sets.
  - Supporting the product team with analytics.
  - Programming according to project plans (versions, sprints).
  - Participating in data analysis and data architecture direction with valuable client-facing development insights.
  - Collaborating with the team designers to create interfaces.
- Sessional Instructor
  Department of Mathematics and Statistics, University of Calgary, Calgary, AB, Canada

  - MATH 211 - Linear Methods I - Spring 2019
  - MATH 211 - Linear Methods I - Summer 2018
  - MATH 275 - Calculus for Engineers and Scientists - Fall 2017 (Through Instructor Training Program)
- Graduate Teaching Assistant 📅 January 2016 - December 2019,
  Department of Mathematics and Statistics, University of Calgary, Calgary, AB, Canada

  I have gained teaching experience by doing a graduate teaching assistant for a variety of courses. These courses are 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).
- Self-employed Mathematics Tutor 📅 October 2010 - August 2015,
  Tehran, Iran

Research Experience

- Data Scientist/Research Scientist 📅 July 2020 - Present,
  Earth & Space Inc., Calgary, AB, Canada

  Developed an algorithm for water surface dynamics of the lakes of Alberta with Earth observation data and analyzed the results through drawing compassion with other data sets.

- Graduate Student 📅 January 2016 - December 2019
  Department of Mathematics and Statistics, University of Calgary, Calgary, AB, Canada

  Developed several robust and higher-order finite difference methods for the wave equation in both frequency and time domain.

- Research Associate 📅 February 2012 - May 2015,
  School of Mathematics, Iran University of Science and Technology, Iran

  Constructed numerical schemes using the Mollification method and the Marching scheme to estimate unknown parameters in inverse heat conduction problems

- Graduate Student 📅 October 2010 - August 2012,
  School of Mathematics and Computer science, Damghan University, Iran

  Developed some numerical schemes based on the application of the Marching scheme and the Mollification method for finding the stable numerical solution of a class of semi-linear Cauchy problems.

Ongoing Projects

1. **H. Dastour**, E. Ghaderpour, and Q. K. Hassan A Comparative Study of Climate Data in Alberta *To be submitted to an academic Journal*, 2021.

Publication Under Review

1. **H. Dastour**, E. Ghaderpour, and Q. K. Hassan A Combined Approach for Monitoring Monthly Surface Water/Ice Dynamics of Lesser Slave Lake via Earth Observation Data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2021.

Journal Publications

1. **H. Dastour** and W. Liao. A generalized optimal fourth-order finite difference scheme for a 2D Helmholtz equation with the perfectly matched layer boundary condition. *Journal of Computational and Applied Mathematics*, 394:113544, 2021.

2. **H. Dastour** and W. Liao. An optimal 13-point finite difference scheme for a 2D Helmholtz equation with a perfectly matched layer boundary condition. *Numerical Algorithms*, 86(3):1109–1141, 2021.

3. **H. Dastour** and W. Liao. A fourth-order optimal finite difference scheme for the Helmholtz equation with PML. *Computers & Mathematics with Applications*, 78(6):2147–2165, 2019.

4. 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*, 321:385–400, 2018.

5. M. Garshasbi and **H. Dastour**. A mollified marching solution of an inverse ablation-type moving boundary problem. *Computational and Applied Mathematics*, 35(1):61–73, 2016. [1]

6. M. Garshasbi and **H. Dastour**. Estimation of unknown boundary functionsin an inverse heat conduction problem using a mollified marching scheme. *Numerical Algorithms*, 68(4):769–790, 2015.[1]

7. M. Garshasbi and **H. Dastour**. Proportional factors estimation in an IHCP. *Journal of Hyperstructures*, 3(1):53–67, 2014.[1]

8. M. Garshasbi, **H. Dastour**, and M. Jalalvand. A stable numerical solution of an inverse moving boundary problem of heat conduction using discrete mollification approach. *Advances in Mathematical Modeling*, 2(1):47–60, 2012.[1]

9. M. Garshasbi, P. Reihani, and **H. Dastour**. A stable numerical solution of a class of semi-linear cauchy problems. *Journal of Advanced Research in Dynamical and Control Systems*, 4:56–67, 2012.[1]

Computer Skills

- Proficiency with computer programming including MATLAB, Python (TensorFlow, PyTorch, Keras, Scikit-Learn, NLP, Pandas, Dask...), R, Julia Programming, and others.
- Proficiency with SQL Server Analysis Services (SSAS).
- Proficiency with visualization tools such as Plotly, Power BI, etc.
- 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.
- Proficiency with Microsoft Windows, mac-OS, and various Linux distributions.

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[1]It is customary in my country of origin, Iran, to see graduate students' names after the name of their supervisor(s) on research papers.

Group Projects

- 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,

- 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.

Awards

- Awards at University of Calgary:
  - PIMS Doctoral Recruitment Scholarship. Amount: 10,000.00 C\$ 2015 – 2016
  - Eric Milner Graduate Scholarship. Amount: 5,500.00 C\$ 2016 – 2017
  - Alberta Innovates Graduate Student Scholarship. Amount: 31,500.00 C\$ 2017 – 2018
  - Alberta Innovates Graduate Student Scholarship. Amount: 31,500.00 C\$ 2018 – 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

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).

Certifications

- Recognition of outstanding efforts and accomplishments on behalf of the SIAM Chapter at the University of Calgary, Canada.
- Recognition of the Completion of the Instructional Skills Workshop (ISW).
- Certificate of Appreciation for having made valuable contributions to the June 2016 Convocation Ceremonies.

Professional Services and Committees

- Student researcher speaker in the open educational resource videos for Taylor Institute for Teaching and Learning, University of Calgary
  - Calgary, Canada ⬛ October 2019
- Committee member of the Department of Mathematics and Statistics Graduate committee, University of Calgary
  - Calgary, Canada ⬛ October 2016 - September 2018
- Contribution to 2018 Industrial Problem Solving Workshop (IPSW), University of Calgary
  - Calgary, Canada ⬛ August 19, 2018 - August 24, 2018
- Served as a member of the Department of Mathematics and Statistics Head Search Committee, University of Calgary
  - Calgary, Canada ⬛ March 2018
- Instructor of Programming Workshop at 2017 CMS Math Camp (Alberta), University of Calgary
  - Calgary, Canada ⬛ July 2017
- Contribution to the June 2016 convocation ceremonies, University of Calgary
  - Calgary, Canada ⬛ June 2016
- The vice-president academic of Graduate University Mathematics Society (GUMS), University of Calgary
  - Calgary, Canada ⬛ September 2016 - September 2018
- The founder and president of University of Calgary SIAM Student Chapter, University of Calgary
  - Calgary, Canada ⬛ January 2017 - September 2018
- Organizer of the University of Calgary Chapter of SIAM Biweekly Seminar Series
  - Calgary, Canada ⬛ February 2017 - April 2018
- Organizer of Calgary Applied and Industrial Mathematical Sciences Conference
  - Calgary, Canada ⬛ May 21, 2017 - May 22, 2017

Languages

English and Persian (Farsi)