

# Mohammad Alamgir Hossain

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Ph.D. Student  
Department of Mathematics  
Simon Fraser University  
Burnaby, British Columbia, V5A 1S6, Canada

email: mahossai@sfu.ca  
Webpage: www.sfu.ca/~mahossai

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**RESEARCH INTERESTS** Data assimilation methods for Glaciology, Geophysical Fluid Dynamics, Computational Fluid Dynamics, Numerical Analysis, Scientific Computing

**EDUCATION** **Simon Fraser University**, Burnaby, BC, Canada

Ph.D., Mathematics, Sept 2015 - in progress

- PhD project: *Ice Sheet Modelling using the Level Set Method and Data Assimilation*
- Supervisors: Assoc. Prof. Sam Pimentel & Professor John Stockie

**Memorial University of Newfoundland**, St. John's, NL, Canada

M.Sc., Mathematics, Jan 2013 - May 2015

- Thesis: *A numerical study of penetrative turbulence in convective boundary layers*
- Supervisor: Assoc. Prof. Jahrul Alam
- GPA: 4.00/4.00 (90.0/100)

**University of Dhaka**, Dhaka, Bangladesh

M.S., Pure Mathematics, Feb 2009

B.Sc. (Honours), Mathematics, April 2007

- Thesis: *Double Integrals over an Arbitrary Triangular Region*
- Supervisor: Dr. Md. Shafiqul Islam, Professor
- Result: 1st Class 3rd Position

**WORK EXPERIENCE** **Assistant Professor (on study leave)** May 2012 -  
Department of Mathematics, Jagannath University, Bangladesh

**Computer Vision/Machine Learning**

**Research Associate (Internship)** Summer and Fall 2021  
3DM Devices Inc., Canada

**Sessional Instructor** Fall 2019

Department of Mathematics, Simon Fraser University, Canada

- Fall 2019: MATH 154 D200 Calculus I for the Biological Sciences
- Fall 2018: MACM 316 Computational Math Co-Instructor

**Research Assistant** Spring 2019

- Developed a bank of clicker questions for students in MACM 316 funded through an Open Educational Resources (OER) grant project of SFU

**Teaching Assistant** Fall 2015 - Fall 2020

Department of Mathematics, Simon Fraser University, Canada

- Spring 2020, Fall 2020: MACM 316 (Numerical Analysis I)
- Spring 2018: MACM 316 (Numerical Analysis I)
- Spring 2017: MATH 467 (Dynamical Systems)
- Fall 2016: MATH 310 and Applied Calculus Workshop
- Fall 2015, Spring 2016, Fall 2017, Spring 2018: Calculus Workshop

**Teaching & Research Assistant** Jan 2013 - April 2015

Department of Mathematics and Statistics, Memorial University of Nfld, Canada

**Lecturer** Oct 2009 - May 2012

Department of Mathematics, Jagannath University, Bangladesh

**Lecturer** in Mathematics Oct 2008 - Sept 2009

Institute of Natural Science, United International University, Bangladesh

PROFESSIONAL  
DEVELOPMENT  
TRAINING

- Grad Certificate in University Teaching and Learning (January 2020 - April 2020), This is a four-month, 120-hour, Senate-approved non-credit certificate for SFU graduate students who are aiming for employment in post- secondary institutions.
- Instructional Skills Workshop, April 2017, SFU Burnaby, Canada.
- 30th Annual Fall Semester TA/TM Day, 11 September 2015, SFU Burnaby, Canada.
- Professional Skilled Development Program (PSDP), Memorial University of Newfoundland, Canada.

PUBLICATIONS

1. M. Alamgir Hossain, P. M. Menz and J. M. Stockie (2021) - An open-access clicker question bank for numerical analysis, PRIMUS (accepted)
2. M. Alamgir Hossain, S. Pimentel and J. Stockie (2020) - Modelling Dynamic Ice Sheet Boundaries using the Level Set Method, *Journal of Glaciology*, 66.259: 766-776.
3. J. M. Alam and M. Alamgir Hossain (2017) - Penetrative turbulence associated with mesoscale surface heat flux, *Journal of Engineering and Applied Sciences*, 12(8), 2017.
4. A. S. Bhuiyan, M. Alamgir Hossain and J. M. Alam (2016) - A Computational Model of Thermal Monitoring at a Leakage in Pipelines, *International Journal of Heat and Mass Transfer* 92: 330-338, 2016.
5. M. Alamgir Hossain and J. M. Alam (2015) - Flow regimes of mesoscale circulations forced by inhomogeneous surface heating, Proceedings of the 23<sup>rd</sup> Annual Conference of the Computational Fluid Dynamics Society of Canada, CFDSC 2015.
6. A. S. Bhuiyan, M. Alamgir Hossain and J. M. Alam (2015) - A computational model of temperature monitoring at a leakage in a leak detection system of a pipeline, Proceedings of the 25th Canadian Congress of Applied Mechanics, CANCEM 2015.
7. J. M. Alam, R. P. Walsh, M. A. Hossain, and A. M. Rose (2014) - A computational methodology for two-dimensional fluid flows; *International Journal for Numerical Methods in Fluids*, 75(12): 835-859.
8. M. Alamgir Hossain and Md. Shafiqul Islam (2014) - Generalized Composite Numerical Integration Rule Over a Polygon Using Gaussian Quadrature, *Dhaka University Journal of Science* 62(1):25-29.
9. Mostak Ahmed and M. Alamgir Hossain (2012)-Transcendental Equation in Quadratic Form and Its Solution, *Bangladesh Journal of Scientific & Industrial Research*, 47(2): 239-242.
10. Md. Shafiqul Islam and M. Alamgir Hossain (2010)-Application of Composite Numerical Integrations over a Standard Square Finite Element, *Jahangirnagar University Journal of Science* , 33(1): 75-86.
11. Md. Shafiqul Islam, Mostak Ahmed and M. Alamgir Hossain (2010)-Numerical Solutions of IVP Using Finite Element Method with Taylor Series, *GANIT-Journal of Bangladesh Mathematical Society*, 30: 51-58.
12. M. A. Hossain and M.S. Islam (2010)- Application of Composite Numerical Integrations Using Gauss-Radau and Gauss-Lobatto Quadrature Rules, *Journal of Scientific Research*, 2(3): 465-477.
13. Md. Shafiqul Islam and M. Alamgir Hossain (2009)- Numerical Integrations over an Arbitrary Quadrilateral Region, *Applied Mathematics and Computations (Elsevier)*, 210(2): 515-524.

14. Md. Shafiqul Islam and M. Alamgir Hossain (2008)- Numerical Integration over an Arbitrary Triangular Region, *International e-Journal of Numerical Analysis and Related Topics (IeJNART)*, Vol 2, June 2008.

CONFERENCE/  
SEMINAR  
PRESENTATIONS

1. M. Alamgir Hossain, S. Pimentel and J. Stockie (2020) - Using data assimilation to model terminus change in marine outlet glaciers, MAR42- Changes in the Marine Cryosphere, Arctic Change 2020.
2. M. Alamgir Hossain, S. Pimentel and J. Stockie (2019) - Using the Level Set Method to Model the Evolving Ice Interface in Fast Glacier Flow, 27th IUGG General Assembly, July 8-18, Montreal, Canada.
3. M. Alamgir Hossain, S. Pimentel and J. Stockie (2018) - Ice Sheet Modelling using the Level Set Method, Canadian Mathematical Society Winter Meeting, Vancouver, BC, Canada, Dec. 2018.
4. M. Alamgir Hossain, Sam Pimentel and John Stockie (2017) - The Evolution of Radially Symmetric Ice Sheet using Level Set Method, Meeting of Northwest Glaciologists 2017, 13-14 October 2017, UBC, Canada. (Poster)
5. M. Alamgir Hossain, Sam Pimentel and John Stockie (2017) - The Evolution of Radially Symmetric Ice Sheet using Level Set Method, SFU Symposium on Mathematics and Computation 2017, 15 August 2017, SFU, Canada. (Poster)
6. M. Alamgir Hossain, Sam Pimentel and John Stockie (2016) - Modelling Glacier Advance and Retreat using the Level Set Method, Meeting of Northwest Glaciologists 2016, 14-15 October 2016, University of Washington, Seattle, USA.
7. M. Alamgir Hossain, Sam Pimentel and John Stockie (2016) - Data Assimilation Methods for the Evolution of Glacier using Level Set Method, SFU Symposium on Mathematics and Computation 2016, 15 August 2016, SFU, Canada. (Poster)
8. M. Alamgir Hossain, Sam Pimentel and John M. Stockie (2016) - Data Assimilation Methods for Glaciology using Level Set Method, Oberwolfach Seminars 2016, 15 - 21 May 2016, ID: 1620a, Mathematisches Forschungsinstitut Oberwolfach, Germany.(Poster)
9. M. Alamgir Hossain and J. M. Alam (2015) - Penetrative Turbulence in Atmospheric Boundary Layer due to Inhomogeneous Surface Heating, *Seminar on Applications of Mathematics in Real Life (SAMRL 2015)* of Bangladesh Mathematical Society, August 22, 2015, Jagannath University, Dhaka, Bangladesh.
10. M. Alamgir Hossain and J. M. Alam (2015) - Flow regimes of mesoscale circulations forced by inhomogeneous surface heating, 23<sup>rd</sup> Annual Conference of the Computational Fluid Dynamics Society of Canada (CFDSC 2015), June 7-10, 2015, Waterloo, Ontario, Canada.
11. M. Alamgir Hossain and J. M. Alam (2015) - Turbulence structure in the convective boundary layer of urban heat island, Aldrich Interdisciplinary Conference, Memorial University of Newfoundland, March 20-22, 2015.
12. M. Alamgir Hossain (2015) - Penetrative turbulence in the atmospheric boundary layer, Annual Research Day, Department of Mathematics and Statistics, Memorial University of Newfoundland, February 17, 2015.
13. M. Alamgir Hossain and J. M. Alam (2014) - Numerical modelling of the nonhydrostatic mesoscale stratified flows, 2014 CMS Winter Meeting, December 5-8, 2014, Hamilton, Ontario, Canada.

14. M. Alamgir Hossain (2014) - Numerical Modelling of the Urban Heat Island Circulation, Graduate Seminar, Department of Mathematics and Statistics, Memorial University of Newfoundland, February 06, 2014.
15. M. Alamgir Hossain (2011) - Numerical Integration over a Polygon, 17th Mathematics Conference of Bangladesh Mathematical Society, December 22-24 , 2011, Dhaka, Bangladesh.
16. M. Alamgir Hossain and Mostak Ahmed (2011)-Application Of Gauss Legendre Quadrature Rule For Solving Initial Value Problems, The First International Conference on Applied Sciences, Mathematics and Humanities, November 14-15, 2011, Royal Bintang Seremban Malaysia.
17. M. Alamgir Hossain and Md. Shafiqul Islam (2009)- Applications Of Composite Numerical Integrations Using Gauss Radau And Gauss Lobatto Quadrature Rules, 16th Mathematics Conference of Bangladesh Mathematical Society, December 17-19, 2009, Dhaka, Bangladesh.

PROFESSIONAL  
WORKSHOP/  
SUMMER SCHOOL/  
CONFERENCE  
ATTENDED  
(SELECTED)

- CAIMS Annual Meeting 2019, Simon Fraser University, Canada.
- WestGrid Research Computing Summer School, 2017 and 2018, UBC.
- 2016 Graduate Mathematical Modelling in Industry Workshop, 7-13 August 2016, University of British Columbia, Vancouver, Canada.
- Data Assimilation: The Mathematics of Connecting Dynamical Systems to Data, Oberwolfach Seminars 2016, Mathematisches Forschungsinstitut Oberwolfach, Germany.
- Conference on the Mathematics of Sea Ice, 24-26 September 2015, SFU Harbour Centre, Vancouver, Canada.
- The 2015 AMMCS-CAIMS Congress, Waterloo, Canada.
- ACEnet Parallel Programming Sessions, June 2013, Memorial University of Newfoundland.
- Introductory ACEnet Sessions: (1)Introduction to ACEnet, (2)Introduction to Linux, (3)Grid Engin and (4)Shell Scripting, January 2013, Memorial University of Newfoundland.

COMPUTER SKILLS

- Languages: C, C++, Octave, Fortran, HTML, R, Python
- Scientific Computing: MATLAB, Mathematica, Maple, libMesh, PETSc
- Applications: L<sup>A</sup>T<sub>E</sub>X, Jupyter, Gnuplot, Emacs, MS office, etc.
- Operating Systems: Unix/Linux, Windows

AWARDS AND  
SCHOLARSHIPS

- Thesis Completion Fellowship, Simon Fraser University, Spring 2021.
- Travel & Minor Research Award, Simon Fraser University, Summer 2019.
- Graduate Fellowship (GF), Simon Fraser University (Summer 2016 and 2018).
- Graduate research assistantship, Trinity Western University (2016 - 2018).
- School of Graduate Studies(SGS) baseline Fellowship, Memorial University of Newfoundland (January 2013 - December 2014).
- Graduate research assistantship, Memorial University of Newfoundland (January 2013 - April 2015).
- Student Travel Award, The 2015 AMMCS-CAIMS Congress, Waterloo, Canada.
- Travel grant to attend the 2014 CMS Winter Meeting, December 5-8, 2014, Hamilton, Ontario, Canada.
- General Government Scholarship in Bangladesh, based on the result of B.Sc.

MEMBERSHIP

Society for Industrial and Applied Mathematics (SIAM); Bangladesh Mathematical Society.