Helmut Wahanik, PhD

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Status in Canada: Permanent Resident.

Areas of specialization

Applied Mathematics:
Algorithms for Numerical Partial Differential Equations and Inverse problems
Computational Geometry, Numerical Analysis, Computational Tomography, Deep Learning.

Software Development:
C#, .NET, C++, Matlab, Python, Fortran, Visual Studio, MatPlotLib, TFS Source Control, Linux, OpenMPI.

Selected publications and talks

Please find a comprehensive list of publications and talks in the Github account:
https://github.com/hwahanik

Education

2015 - 2016 **Postdoctoral Fellow - Computer Science**
University of Calgary, Calgary.
Research on Computational Geometry for unstructured autonomous meshing of 3D geology based models, with Aramco Upstream Research Center (URC), Houston, Texas, USA.

2007-2011 **PhD in Applied Mathematics**
Instituto de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, www.impa.br
Co-supervised by TUDelft-The Netherlands.
PhD in numerical PDEs, shock waves and rarefactions of flow dynamics, and thermodynamics. Numerical computing algorithms coded in C++, Matlab, in Linux. For completion of the Ph.D, two exams were presented: the first in Applied Mathematics, Fluid Dynamics, and Numerical Analysis, and the second in Mathematical Analysis.

2006-2007 **Scientific Computing Advanced Training**
University of Bristol, Bristol-UK.
EU grant for young scientists, Department of Mathematics, University of Bristol-UK.
One-semester program focusing in mesh-less methods for Navier-Stokes equations, modelling large-scale climatic fluids.

2005-2006 **MSc in Computational Mathematics and Modelling**
IMPA, Rio de Janeiro
Applied Mathematics, Partial and Ordinary Differential Equations, Numerical Analysis, and Fluid Dynamics.

1999-2004 **BSc in Mathematics, Minor in Biology**
Universidad de los Andes, Bogotá-Colombia

Professional Experience

Jun 2016 - Current
Software Engineer
Waterloo Hydrogeologic, Waterloo. https://www.waterloohydrogeologic.com
Coding of the industry standard software for groundwater simulation, Visual MODFLOW Flex; code is based on large OOP arquitecture (180+ projects), more than 7 million lines of code, in C#, .NET, C++, F#, and Fortran.

2015 - 2016
Research Project Manager
University of Calgary, Calgary.
Member of the Interactive Modelling, Visualization and Analytics (illustraRes) research group, working as a project manager of applied research for industry-wide clients.

2011-2015
Research Scientist
Schlumberger Research, Rio de Janeiro.
Research on parallel deep learning algorithms for Seismic Tomography based on transdimensional Markov chain Monte Carlo - where the dimension of the space of parameters is an unknown stochastic parameter, among other projects in data science and scientific computing.

Highlights:
• Computational seismic tomography together with Schlumberger Gould Research (SGR), University of Cambridge-UK, and the University of Edinburgh-UK (research in stochastic inverse problems for imaging). Link to tMCMC publications
• Parallel computing solutions in Fortran, MPI, and Python, in Linux, for Computational Seismic Tomography, together with SGR, Cambridge-UK. Link to tMCMCTomography CODE
• Statistical study of failures and reliability engineering of deepwater wells in the Gulf of México, for Schlumberger México Operations.
• Data science methods applied to characterization of Carbonates rock samples. Link here
• Multiphase fluid dynamics research for analyzing wellbore fluid flow jointly with Schlumberger Moscow Research, Moscow-Russia.
• Operations research for optimization of portfolios, and creation of winning strategies for optimal bidding of multimillionaire contracts, for SLB VPs, Rio de Janeiro.

Teaching

2007-2011 Teaching assistant, IMPA. Mentor for graduate applied mathematics students.
2006-2007 Teaching assistant, Math Dept., U. of Bristol-UK. Mentor for undergraduate science students.
1999-2004 Lecturer, Universidad de los Andes. Lecturer of the courses: Statistics for the Social Sciences, Linear Algebra, and Differential Calculus. Teaching assistant for several undergraduate mathematics courses.

Awards

2005-2011 PhD and MSc Full Graduate Scholarships, IMPA, Rio de Janeiro-Brazil
2006-2007 SCAT EU Mobility Grant, Dept. of Mathematics, University of Bristol-UK
2000 Henry Yerly Scholarship, Dept. of Mathematics, Universidad de los Andes, Bogotá-Colombia

Other

Hobbies:
Running, swimming, spending time with my family, playing with my beloved daughter and son.
Languages:
English (*fully proficient*), Spanish (*native*), Portuguese (*fully proficient*).