

Abdul-Lateef Haji-Ali

- PERSONAL INFORMATION Syrian, born 1988
Native in Arabic, fluent in English
- CONTACT INFORMATION Colin Maclaurin Building, G.15 +44 (0) 131 451 3206
Heriot-Watt University a.hajiali@hw.ac.uk
Edinburgh Campus <http://www.macs.hw.ac.uk/~ah180/>
Edinburgh, Scotland, EH14 4AS
- RESEARCH INTERESTS Uncertainty Quantification, Stochastic Differential Equation, Numerical methods for SDEs and PDEs, Multilevel Monte Carlo, Particle systems, Crowd modelling, Mean-field theory, Sparse Grids, Combination techniques, Multi-index techniques, Inverse problems.
- EDUCATION **King Abdullah University of Science and Technology (KAUST)**, Saudi Arabia
Ph.D., Applied Mathematics, December 2012 to May 2016
Thesis Title: *Efficient multilevel and multi-index sampling methods in stochastic differential equations*
Advisor: Raúl Tempone
M.S., Applied Mathematics, September 2010 to December 2012
Published Thesis: *Pedestrian Flow in the Mean-field Limit*
Advisor: Raúl Tempone
Arab International University, Damascus, Syria
B.S., Informatics Engineering, September 2005 to August 2010
Project: Recognition using spectral imaging, theory and algorithms
- EMPLOYMENT Mathematical Institute — University of Oxford
• Hooke Research Fellowship, 05 September 2016 to 05 September 2019.
St. Anne’s College — University of Oxford
• College Association, January 2017 to January 2019.
- REFEREED JOURNAL PUBLICATIONS
1. A.-L. Haji-Ali, F. Nobile, R. Tempone, and S. Wolfers. “Multilevel weighted least squares polynomial approximation”. In: *ESAIM: Mathematical Modelling and Numerical Analysis* 54.2 (2020), pp. 649–677. DOI: 10.1051/m2an/2019045.
 2. M. B. Giles and A.-L. Haji-Ali. “Multilevel nested simulation for efficient risk estimation”. In: *SIAM/ASA Journal on Uncertainty Quantification* 7.2 (2019), pp. 497–525. DOI: 10.1137/18M1173186.
 3. A.-L. Haji-Ali and R. Tempone. “Multilevel and Multi-index Monte Carlo methods for the McKean–Vlasov equation”. In: *Statistics and Computing* 28.4 (July 2018), pp. 923–935. ISSN: 1573-1375. DOI: 10.1007/s11222-017-9771-5.
 4. A.-L. Haji-Ali, H. Harbrecht, M. Peters, and M. Siebenmorgen. “Novel results for the anisotropic sparse grid quadrature”. In: *Journal of Complexity* 47 (2018), pp. 62–85. DOI: 10.1016/j.jco.2018.02.003.
 5. A.-L. Haji-Ali, F. Nobile, L. Tamellini, and R. Tempone. “Multi-index stochastic collocation for random PDEs”. In: *Computer Methods in Applied Mechanics and Engineering* 306 (2016), pp. 95–122. DOI: 10.1016/j.cma.2016.03.029.

6. A.-L. Haji-Ali, F. Nobile, L. Tamellini, and R. Tempone. “Multi-index Stochastic Collocation Convergence Rates for Random PDEs with Parametric Regularity”. In: *Foundations of Computational Mathematics* 16.6 (Dec. 2016), pp. 1555–1605. ISSN: 1615-3383. DOI: 10.1007/s10208-016-9327-7.
7. A.-L. Haji-Ali, F. Nobile, and R. Tempone. “Multi-index Monte Carlo: when sparsity meets sampling”. In: *Numerische Mathematik* 132.4 (2016), pp. 767–806. DOI: 10.1007/s00211-015-0734-5.
8. N. Collier, A.-L. Haji-Ali, F. Nobile, E. von Schwerin, and R. Tempone. “A continuation Multilevel Monte Carlo algorithm”. In: *BIT Numerical Mathematics* 55.2 (2015), pp. 399–432. ISSN: 0006-3835. DOI: 10.1007/s10543-014-0511-3.
9. A.-L. Haji-Ali, F. Nobile, E. von Schwerin, and R. Tempone. “Optimization of mesh hierarchies in Multilevel Monte Carlo samplers”. In: *Stochastic Partial Differential Equations: Analysis and Computations* 4.1 (2015), pp. 76–112. ISSN: 2194-0401. DOI: 10.1007/s40072-015-0049-7.

PREPRINTS

10. M. B. Giles and A.-L. Haji-Ali. “Sub-sampling and other considerations for efficient risk estimation in large portfolios”. In: arXiv:1912.05484 (2019).

AWARDS

- Second-place Leslie Fox Prize, June 2019.
- Fulford Non-stipendiary Junior Research Fellowship, Somerville College, University of Oxford, October 2017 to September 2019.
- Hooke Research Fellowship, Mathematical Institute, University of Oxford, September 2016 to September 2019.
- King Abdullah University of Science and Technology Fellowship 2010
- Academic Excellence Award, King Abdullah University of Science and Technology 2010.
- Top Student Scholarship, Arab International University, 2006 to 2010.

TEACHING EXPERIENCE

- **Short course.** “Specialist 03: Monte Carlo simulations”, InFoMM CDT, University of Oxford, March 2018.
- **Tutor** “Stochastic Differential Equations”, Mathematical Institute, University of Oxford, October to November 2017 and 2018.
- **Tutor** “Differential Equations”, St. Anne’s College, University of Oxford, October to November 2017.
- **Tutor** “Constructive Maths”, St. Anne’s College, University of Oxford, May 2017.
- **Tutor** “Martingale Through Measure Theory”, Mathematical Institute, University of Oxford, May 2017 and October to November 2018.
- **Tutor** “Differential Equations II”, St. Anne’s College, University of Oxford, January to July 2017 and 2018.
- **Tutor** “Numerical Analysis”, St. Anne’s College, University of Oxford, January to July 2017 and 2018.
- **Project supervisor** “Multilevel Hierarchical Markov Chain Monte Carlo”, Centre for Doctoral Training in Mathematical Institute, University of Oxford, January 2017.
- **Teaching assistant** to Prof. Raul Tempone. Graduate course, “Stochastic Differential Equations”, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, Fall Semester, August 2012 to December 2012.
- **Teaching assistant** to Prof. Raul Tempone. Short course, “Stochastic Methods in Engineering”, Universidad de la República in Montevideo, Uruguay, December 2012.

- **Teaching assistant** to Prof. Raul Tempone. Graduate course, “Stochastic Methods in Engineering”, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, Spring Semester, January 2013 to May 2013.
- **Teaching assistant** to Prof. Raul Tempone. Short course, “Uncertainty Quantification” part of a International Summer School on Scientific Computing, University of the Chinese Academy of Sciences, Beijing, July 2013.
- **Teaching assistant** to Prof. Raul Tempone. Short course, “Numerical techniques for PDEs with random input data”, Königlich Technische Hochschule, Stockholm, Sweden, May 2014.
- **Short course.** “mimclib: A Python library for MLMC and MIMC”, UQ School, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, May 2016.

RESEARCH VISITS

- Issac Newton Institute, Cambridge, United Kingdom, April 2018.
- École Polytechnique Fédérale de Lausanne, Switzerland, July 2017.
- RWTH Aachen University, Germany, June 2017.
- École Polytechnique Fédérale de Lausanne, Switzerland, April 2016.
- École Polytechnique Fédérale de Lausanne, Switzerland, August 2015.
- University of Pavia, Pavia, Italy, July 2015.
- Königlich Technische Hochschule, Stockholm, Sweden, June 2015.
- University of Austin, Austin, Texas, USA, July 2014.
- Universidad de la República, Montevideo, Uruguay, December 2013.
- University of Austin, Austin, Texas, USA, June 2013.

CONFERENCES

Organization:

- Co-organiser with Dr. Alberto Paganini of SIAM UKIE annual meeting, January 2019.
- Co-organiser of mini-symposium with Prof. Raul Tempone and Prof. Fabio Nobile: “Forward and inverse UQ with hierarchical models”, MCQMC, Rennes, France, United Kingdom, July, 2018.
- Co-organiser of mini-symposium with Prof. Mike Giles: “Numerical Methods for PDEs in Uncertainty Quantification”, SciCADE, University of Bath, United Kingdom, September, 2017.

Talks:

- MCQMC, Renne, France, July 2018.
- UNQW03, “Reducing dimensions and cost for UQ in complex systems”, Issac Newton Institute, Cambridge, United Kingdom, March, 2018.
- BIRS, “Computational Uncertainty Quantification”, Banff, Canada, October 2017.
- LMS-EPSRC Symposium, “Model Order Reduction”, Durham, August 2017.
- MCM2017, Montreal, July 2017.
- Applied maths seminar, University of Warwick, December 2016.
- Numerical analysis seminar, University of Bath, November 2016.
- UQ Summer School, WIAS Berlin, September 2016.
- SIAM UQ, Lausanne, April 2016.
- SRI UQ16, KAUST, January 2016.
- UQ15, WIAS Berlin, November 2015.
- SciCADE, Potsdam, September 2015.
- ICIAM, Beijing, August 2015.
- MCM 2015, Johannes Kepler University, Linz, July 2015.
- FoCM, Universidad de la República in Montevideo, December 2014.
- SGA, Universität Stuttgart, September 2014.
- NASPDE, École Polytechnique Fédérale de Lausanne, September 2014.
- ENUMATH, École Polytechnique Fédérale de Lausanne, August 2013.

TECHNICAL SKILLS Proficient in C, C++, C#, Java, JavaScript, Python, UNIX shell scripting, GNU make, MySQL, MATLAB, Mathematica.

REFERENCES Raúl Tempone raul.tempone@kaust.edu.sa
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King Abdullah University of Science and Technology, Saudi Arabia.
Mike Giles mike.giles@maths.ox.ac.uk
Professor of Scientific Computing in the Mathematical Institute
Oxford, United Kingdom.
Fabio Nobile fabio.nobile@epfl.ch
Scientific computing and uncertainty quantification - CADMOS Chair
École Polytechnique Fédérale de Lausanne, Switzerland.