Dr. Abdul Hanan Sheikh

Quaid-e-Awam University of Engg., Sc. & Tech.,
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Education

2014	PhD in Mathematics, Delft University of Technology, The Netherlands
2008	MPhill Mathematics, Quaid-i-Azam University Islamabad, Pakistan
2006	MSc Mathematics, Quaid-i-Azam University Islamabad, Pakistan
2004	BSc with Mathematics, Physics and Computer Science, Shah Abdul Latif University, Khairpur Pakistan

Academic Experience

Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah Sindh Pakistan,

- Associate Professor, Department of Mathematics & Statistics, Dec 2018–Present

- Assistant Professor, Department of Mathematics & Statistics, Nov 2014–Dec 2018

- Lecturer, Department of Mathematics & Statistics, Jan 2009–Nov 2014

NED University of Engineering and Technology, Karachi Pakistan

- Lecturer, Department of Mathematics & basic sciences, Jan 2008–Jan 2009

Delft University of Technology, Delft Institute of Applied Mathematics

- PhD fellow, Scientific Computing, Mar 2009–Nov 2014.

Research

Current Intererests

- Iterative methods for large scale sparse linear systems

- Preconditioning Techniques and Deflation type preoconditioners,

- Local fourier analysis of Multigrid deflation for Helmholtz equation,

Research Supervision

- Past: Supervised five (05) MS thesis

- Current: Supervising three (03) PhD students and three (03) MS students

Scientific Software

- MatLab, Maple, Comsol Multiphysics, PETSc, SPSS, Octave, GAP.

Programming

- MatLab, C++, Python, Basic of CUDA

Workshop/Trainings

- Comsol Multiphysics Modelling Workshop, Technische Universiteit Delft Aula congrescentrum, Delf, The Netherlands October 20, 2009.

- Programming on GPU with CUDA at Delft Centre of Computational Science and Engineering DCSE, Netherlands September 13, 2013.

- Study Group Mathematics with Industry at EEMCS Faculty, Delft University of Technology, netherlands, January 27 - 31, 2014

- Workshop on Developing industry Driven Technologies, by PASTIC, National Science Foundation at QUEST Nawabshah Pakistan, Febuary 24, 2015

- Quantum Information Summer School 2016 at Habib University, July 25 - July 28, 2016

- 33rd Master trainer Faculty Professional Development Program (MT- FPDP) Octrober 09, 2017 to November 30, 2017

Publications

Dissertation

- PhD Dissertation: Development of Helmholtz Solver Based on Shifted Laplace Preconditioner and a Multigrid Deflation Technique, Delft University of Technology, The Netherlands 2014

Technical Reports

1. Fast iterative solution methods for the Hemholtz equation. *DIAM Reports* NW 09-11, 2009

2. A scalable Hemholtz solver combining the shifted Laplace preconditioner with multigrid deflation. *DIAM Reports* NW 11-01, 2011

Peer Reviewed Journal Articles

1. On the convergence of shifted Laplace preconditioner combined with multilevel deflation, Numerical Linear Algebra with Applications, *Numerical Linear Algebra with Applications* Volume 20 Issue 4, pp 645-662, 2013

2. Accelerating the shifted Laplace preconditioner for the Helmholtz equation by multilevel deflation, *Journal of Computational Physics* Volume 322, pp 473-490, 2016

3. Local Truncation Error and Associated Principal Error Function for an Iterative Integrator to Solve Cauchy Problems. Science International Volume 28, Issue 4, July 2016 pp 3393-3396, 2016

4. On Aspects of Viscous Damping for an Axially Transporting String, Science International (Lahore),Volume 28(4),3721-3727, 2016

5. On vibrations of an axially Moving Beam under material damping, IOSR Journal of Mechanical and Civil engineering (IOSR-JMCE), Volume 13(5), pp 56-61, 2016

6. On Oscillations of an axially Trnslating Tensioned String-Like Equation under Damping, Science International (Lahore), Volume 28(4),3897-3901,2016

7. Elliptic Curves with many points over a small finite field, Quaid-e-Awam University Research Journal of Engineering, Science & Technology, Volume 15(01), pp 27-31, 2016

8. On Energy Estimates for Damped String-Like Equation Considering Dirichlet, Neumann and Robin Boundary Conditions, Mathematical Theory and Modeling, Volume 06(09), 2016

9. Hybrid Closed Algorithm for Solving Nonlinear Equations in one Variable, Sindh Univ. Res. Jour. (Sci. Ser.) Vol. 48 (4) 779-782, 2016

10. On Oscillations of an Axially Translating Tensioned Beam under Vicous Beam, Science International (Lahore), Volume 28(4),4123-4127, 2016

11. On the Energetics of a Damped Beam-Like Equation for Different Boundary Conditions, Mehran University Research Journal of Engineering and Technology, Volume 36, No. 2, pp 395-400 2017

12. Analysis of Mapping Techniques for Mountain Precipitation: A Case Study of Alpine Region, Austria, Engineering, Technology and Applied Science Research, Volume 08, Issue 04, pp 3213-3217, 2018

13. Effects of Climate Change on Mountain Waters: A Case Study of European Alps, Engineering, Technology and Applied Science Research, Volume 08 (04), pp 3234-3237, 2018

14. On (Non) Applicability of a Mode-Truncation of a Damped Traveling String, Mehran University Research Journal of Engineering and Technology Vol. 38, No. 2, pp 471-478 2019

15. Critical Review of Preconditioners for Helmholtz Equation and their Spectral Analysis, Indian Journal of Science and Technology, Vol 12(20), 2019

16. Exact Solution for PTT Fluid on a Vertical Moving Belt for Lift with Slip Condition, Indian Journal of Science and Technology, Vol 12(30), 2019

17. Slip effects on Magnetohydrodynamic (MHD) flow of Williamson Nanofluid over an Exponentially Shrinking Sheet, SindhUniv. Res. Jour. (Sci. Ser.) Vol. 51 (03) 519-526, 2019

18. Development of Improved Scheme for Numerical Integration of Autonomous and Non-Autonomous Initial Value Problems, Sindh Univ. Res. Jour. (Sci. Ser.) Volume 51 Issue 01 pp 19-24 2019

19. Modeling and Simulation of Newtonian Fluid Flow through Two-dimensional Backward-Facing step channel with Finite Element Technique, Indian Journal of Science and Technology, Vol 12(32), 2019

20. On the Convergence Analysis of Multigrid Method for Shifted Laplace at Various Levels using Fourier Modes accepted in IJCSNS

21. On the Efficiency of Multigrid Solver for Shifted Laplace Equation in a Heterogeneous Medium, Submitted in IJAMS

Conference Papers/Extended Abstracts

1. The 34th, 35th, 36th and 37th Dutch-Flemish Woudschoten Conference, Woudschoten Conference Centre, Zeist, The Netherlands 2009 to 2012.

2. An efficient iterative scheme for the Helmholtz equation with deflation. Eleventh Copper Mountain Conference on ITERATIVE METHODS, April 04-09, 2010, Colorado IL, USA

3. A scalable Helmholtz solver combining the def ation with shifted Laplace preconditioner, Presented in Mini Symposia at 47th Dutch Mathematical Conference 2011, NMC 2011 held at University of Twente, Twente Netherlands, 14-15 April 2011

4. An Scalable Helmholtz Solver Combining the Shifted Laplace Preconditioner With Multigrid Deflation. Sparse Days Meeting , September 06-07, 2011, CERFACS , Tolouse France

5. A scalable Helmholtz solver combining the deflation with shifted Laplace preconditioner. Fifteenth Copper Mountain Conference on MULTIGRID METHODS, March 27 - 01 April 01, 2011, Colorado IL, USA

6. "Fast solvers for seismic problems" A collaborated work with H. Knibbe was prestened by Prof. C. Vuik at International Conference on Mathematical Modeling in Industry November 30th - December 2nd, 2011, University of Sao Paulo, Sao Paulo, Brazil.

7. Efficient Preconditioners with Multilevel Sequentially SemiSeparable Structure. In the 11th International Conference on Numerical Analysis and Applied Mathematics (ICNAAM), September 21-27, 2013, Rhodos, Greece

8. Coarse-grid-correction preconditioner for the Helmholtz Equation. 2014 European Multigrid Conference, September 09-12, 2014, Leuven, Belgium

9. A multilevel ADEF1 Solver for high frequency Helmholtz equation, 1st National Conference on Mathematics and Computer Science (NCMCS'15) January 21-23, 2015, Quaid-e-Awam University, Nawabshah, Sindh, Pakistan

10. Deflating the Shifted Laplacian for the Helmholtz Equation: Fourier Analysis and Numerical Results, International Conference on Preconditioning Techniques For Scientific And Industrial Applications, PRECONDINING-15, 17-19 June, Eindhoven, The Netherlands

11. Multilevel Helmholtz solver with applications in seismic imaging, 14th Regional Conference on Mathematical Physics November 9-14, 2015 Quaid-i-Azam University, Islamabad, Pakistan

Professional Activities

- Member, Pakistan Mathematical Society, 2008–Present

- Member, Dutch Royal Mathematical Society,, 2013–Present

- Founding Member, Siam Delft Students Chapter, 2012–Present

- Reviewer of many ISI indexed Journals

- Chaired sessions at different local (Pakistan) conferences

- Co-chaired Conference RAPAM'16 at QUEST Nawabshah Pakistan

- Served as Technical Committee members of many Interntaional Conferences

Miscellaneous

Honors

- Talent Farming Scholarship (for M.Sc. at QAU Islamabad), by Higher Education Commission of Pakistan, 2005-06.

- Merit Scholarship during MPhill at QAU Islamabad.

- Won best poster award at 36th Dutch-Flemish Woudschoten Conference, Woudschoten Conference Centre, Zeist, The Netherlands 2011.

Countries visited

- Academic Visits: Netherlands, Belgium, Denmark, Germany, France, USA, Greece

- Other Visits: UAE, Sweden, USA, Spain, Hungary, Czech Republic, Slovenia, Saudi Arabia

References

- Kees Vuik
  Professor of Mathematics
  Stanford University of Technology, Netherlands
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- Reinhard Nabben
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- Saleem Raza Samo
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- Ira Livshits
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