Shihua Gong: Curriculum Vitae

4 West 3.35, Department of Mathematical Sciences
University of Bath
BA2 7AY, United Kingdom

Phone: (+44) 7422-632756
Email: sg2328@bath.ac.uk
Web: http://shihua-gong.org

Research Interests

Linear and nonlinear solvers, numerical analysis; finite element methods; domain decomposition methods; multigrid methods; nonlinearly preconditioning techniques; cardiovascular fluid-structure interaction; scientific computing and computer simulation

Education

Beijing International Center for Mathematical Research, Peking University, Beijing, China
PhD in Computational Mathematics, July 2018, Advisor: **Jinchao Xu**
Thesis: Finite element discretization and fast solvers for elastic problems

Sun Yat-sen University, Guangzhou, China
BS in Information and Computational Science, June 2013

Professional Experiences

Mar. 2019 – present Research associate, Department of Mathematical Sciences, University of Bath, UK. Mentors: Ivan Graham and Euan Spence

Aug. 2018 – Feb. 2019 Postdoctoral scholar, Department of Mathematics, Pennsylvania State University, USA. Mentor: Jinchao Xu

Mar. 2017 – Sep. 2017 Visiting student, Department of Computer Science, University of Colorado Boulder, USA. Host: Xiao-Chuan Cai

Nov. 2016 – Feb. 2017 Visiting student, Department of Mathematics, Pennsylvania State University, USA. Host: Jinchao Xu

Sep. 2015 – Mar. 2016 Visiting student, Department of Mathematics, Pennsylvania State University, USA. Host: Jinchao Xu

Publications

[1] New hybridized mixed methods for linear elasticity and optimal multilevel solvers. S. Gong, S. Wu, and J. Xu. *Numerische Mathematik*. 2018.

[2] A nonlinear elimination preconditioned inexact Newton method for heterogeneous hyperelasticity. S. Gong, X.-C. Cai. Submited. to *SIAM Journal on Scientific Computing (SISC)*.

[3] A nonlinear elimination preconditioned Newton's method with applications in arterial wall simulation. S. Gong, X.-C. Cai. *International Conference on Domain Decomposition Methods.* Springer, Cham, 2017.

[4] Interior penalty mixed finite element methods of any order in any dimension for linear elasticity with strongly symmetric stress tensor. S. Wu, S. Gong, and J. Xu. *Mathematical Models and Methods in Applied Sciences,* 27(14), 2711-2743.

[5] A mathematical model of aortic aneurysm formation. W. Hao, S. Gong, S. Wu, J. Xu, M. R. Go, A. Friedman, and D. Zhu. *PloS one 12*, No. 2 (2017): e0170807.

In Preparation

[1] A projection-based and symmetry-correction analysis of HDG methods for linear elasticity on triangular meshes. with Shuonan Wu and Jinchao Xu.

[2] An analysis of the nonlinear elimination preconditioned Newton's method. with Xiao-Chuan Cai.

Teaching Experiences

1. Teaching Assistant, Finite Element Methods, Pennsylvania State University, Aug. 2018 - Dec. 2018
2. Teaching Assistant, Introduction to Fluid Mechanics, Peking University, Mar. 2015 - Jul. 2015
3. Teaching Assistant, Functions of Real Variable and Functional Analysis, PKU, Sept. 2014 - Jan. 2015
4. Teaching Assistant, Linear Algebra, Peking University, Mar. 2014 - Jul. 2014

Skills

- **Programming**: Latex, C\C++, Matlab, MPI, Boost, **FEniCS**, **PETSc**, Paraview, CMake, Gmesh, CUDA
- **Languages**: Chinese, Cantonese (native), English

Presentations

- Invited talk, Bath Numerical Analysis Seminar, University of Bath, Mar. 2019
- Joint Mathematics Meetings: Special Session on Numerical Methods for PDEs, Baltimore, Jan. 2019
- Invited talk, Inverse Problems and Analysis seminar, University of Delaware, Neward, Nov. 2018
- SIAM PP18: Highly Scalable Solvers for Computational PDEs. Waseda University, Tokyo. Mar. 2018
- Invited talk, High Performance Numerical Algorithms and Applications, TSIMF, Sanya, Jan. 2018
- The 15th Annual Meeting of CSIAM, Qindao, Oct. 2017
- Portable, Extensible Toolkit for Scientific Computation Annual Meetings, Boulder, USA, Jun. 2017
- The 18th Copper Mountain Conference on Multigrid Methods, Copper Mountain, USA, Mar. 2017
- The 9th National Finite Element Conference, E'mei, China, Aug. 2016
- The 14th Annual Meeting of CSIAM, Xiantan, Aug.2016
- Invited talk at LSEC, Chinese Academy of Sciences, Beijing, Mar. 2016
- Invited talk, CCMA PDEs and Numerical Methods Seminar, Penn State University, USA, Jan. 2016
- The 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, Aug. 2015

Honor and Awards

- 2016-2017, National Scholarship, Department of Education, China
- 2013-2016, Graduate Scholarship, Peking University
- 2013, Outstanding Graduate Award, Sun Yat-sen University
- 2010-2012, Excellent Undergraduate Scholarship, Sun Yat-sen University
- 2011, the second prize, China Undergraduate Mathematical Contest in Modeling, CSIAM
- 2009-2010, National Scholarship, Department of Education, China

Last updated: March 11, 2019