Guosheng Fu

CONTACT
INFORMATION

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RESEARCH
INTERESTS

Numerical analysis for partial differential equations; Hybridizable discontinuous Galerkin (HDG) and hybrid-mixed finite element methods; Convection-dominated problems; Computational fluid dynamics.

EDUCATION

University of Minnesota, Twin Cities

Ph.D. in Mathematics (June 2016)
- Thesis: Devising superconvergent HDG methods by M-decompositions
- Advisor: Bernardo Cockburn

M.S. in Aerospace Engineering and Mechanics, November 2014
M.S. in Mathematics, June 2014

Nankai University

B.S. in Mathematics, June 2011

PUBLICATIONS

Peer-reviewed journal articles

1. E. Chung, B. Cockburn, and G. Fu, *The staggered DG method is the limit of a hybridizable DG method.* SIAM J. Numer. Anal., 52(2014), pp. 915-932.

2. E. Chung, B. Cockburn, and G. Fu, *The staggered DG method is the limit of a hybridizable DG method. Part II: the Stokes system.* J. Sci. Comput., 66(2016), pp. 870-887.

3. G. Fu, W. Qiu, and W. Zhang, *An analysis of HDG methods for convection dominated diffusion problems.* ESAIM Math. Model. Numer. Anal., 49(2015), pp. 225-256.

4. H. Chen, G. Fu, J. Li, and W. Qiu, *First order least square method with weakly imposed boundary condition for convection dominated diffusion problems.* Comput. Math. Appl., 68(2014), pp. 1635-1652.

5. G. Fu, B. Cockburn, and H. Stolarski, *Analysis of an HDG method for linear elasticity.* Internat. J. Numer. Methods Engrg., 102(2015), pp. 551-575.

6. B. Cockburn, G. Fu, and F.-J. Sayas, *Superconvergence by M-decompositions. Part I: general theory for HDG methods for diffusion.* Math. Comp., to appear (2016).

7. B. Cockburn and G. Fu, *Superconvergence by M-decompositions. Part II: construction of two-dimensional finite elements.* ESAIM Math. Model. Numer. Anal., to appear (2016).

8. B. Cockburn and G. Fu, *Superconvergence by M-decompositions. Part III: construction of three-dimensional finite elements.* ESAIM Math. Model. Numer. Anal., to appear (2016).

9. B. Cockburn, G. Fu, and W. Qiu, *A note on the devising of superconvergent HDG methods for the Stokes flow by M-decompositions.* IMA J. Numer. Anal., to appear (2016).

Submitted Journal articles

10. B. Cockburn and G. Fu, *Devising superconvergent HDG methods with symmetric approximate stresses for linear elasticity.*

11. B. Cockburn and G. Fu, *A systematic construction of finite element commuting exact sequences.*

CONFERENCE
TALKS

1. *The staggered DG method is the limit of a hybridizable DG method.* 12th U.S. National Congress on Computational Mechanics. Raleigh, North Carolina. (July 22-25, 2013)

2. *The staggered DG method for the Stokes flow is the limit of a hybridizable DG method*, ICOSAHOM 2014. Salt Lake City, Utah. (June 23-27, 2014)

3. *Speeding up the mixed finite-element method for reservoir simulation.* The Finite Element Circus. Minneapolis, Minnesota. (October 24-25 2014)

4. *Superconvergence of HDG methods for linear elasticity with strong symmetry.* SIAM CSE 2015. Salt Lake City, Utah. (March 14-18, 2015)

5. *HDG methods for diffusion: Superconvergence by M-decompositions.* The 1st Annual Meeting of SIAM Central States Section. Rolla, Missouri. (April 11-12, 2015)

6. *HDG for diffusion: Superconvergence by M-decompositions.* The 8th International Congress on Industrial and Applied Mathematics. Beijing, China. (August 10-14, 2015)

7. *HDG methods for diffusion problems.* The Mathematics of Finite Elements and Applications 2016. Brunel University London, United Kindom (June 14-17, 2016)

TEACHING
EXPERIENCE

Fall	2011	Teaching Assistant, Calculus I
Spring	2012	Teaching Assistant, Calculus II
Fall	2012	Teaching Assistant, Precalculus II
Fall	2013	Teaching Assistant, Precalculus II
Fall	2014	Teaching Assistant, Calculus II

HONORS AND
AWARDS

2015	SIAM Student Travel Award for SIAM Conference on Computational Science and Engineering (CSE15).
2015	Charles and Dorothy Andrew Bird Award, Sigma Xi.
2015-2016	Doctoral Dissertation Fellowship, University of Minnesota.

INDUSTRIAL
RESEARCH
EXPERIENCE

ExxonMobil's Corporate Strategic Research laboratory, New Jersey

Summer internships at the Engineering and Computational Physics Section, May-August 2014 and May-July 2015

COMPUTER
SKILLS

Operating system:	Linux, Windows
Programming language:	Fortran, Python, C++, Matlab
Software:	MicroSoft, LaTeX, Mathematica, Tecplot, Paraview, FEniCS, Deal.II, etc.