

Curriculum Vitae of Kwang-Yeon Kim

Contact Info

- ◆ Current Address : Department of Mathematics
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Education

- 📖 1994.02, B.S. in Mathematics, Korea Advanced Institute of Science and Technology
- 📖 1996.02. M.S. in Mathematics, Korea Advanced Institute of Science and Technology
- 📖 2002.08. Ph.D. in Mathematics, Korea Advanced Institute of Science and Technology
Thesis title: Mixed finite volume methods on quadrilateral grids for second-order elliptic problems (Advisor: Do-Young Kwak)

Professional Experience

- 2008.03-present Full-time Lecturer, Department of Mathematics,
Kangwon National University, Chuncheon, South Korea.
- 2007.08-2008.02 Postdoctoral Researcher, Department of Mathematics,
Ajou University, Suwon, South Korea.
- 2006.03-2007.02 Full-time Lecturer, Department of Applied Mathematics,
Sejong University, Seoul, South Korea.
- 2004.07-2005.07 Postdoctoral Researcher, Department of Aerospace Engineering,
Korea Advanced Institute of Science and Technology
- 2003.05-2004.04 Research Associate, Department of Mathematics
Southern Methodist University, Dallas, USA.
- 2002.08-2003.03 Postdoctoral Researcher, Department of Mathematics,
Korea Advanced Institute of Science and Technology.
- 1996.03-2000.02 Teaching Assistant, Department of Mathematics,
Korea Advanced Institute of Science and Technology.

Research Interests

- ❖ Numerical analysis and scientific computing
- ❖ Finite element methods, Finite volume methods, Discontinuous Galerkin methods
- ❖ A posteriori error estimators and adaptive mesh refinement
- ❖ Computational Fluid Dynamics: Navier-Stokes equation, Quasi-Newtonian fluid flow
- ❖ Solid mechanics: elasticity problems, obstacle and contact problems
- ❖ PDE-constrained optimal control problems

Research Grants

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| 2009.05-2011.04 | <i>A Posteriori Error Estimates for Linear Elasticity and Stokes Problems</i>
National Research Foundation of Korea (NRF), 105,441,000 won. |
| 2008.07-2009.06 | <i>Efficient Numerical Algorithm for Locally Mass-Conservative Discretization of Darcy's Law</i> , Korea Research Foundation (KRF), 21,400,000 won. |
| 2008.07-2009.06 | <i>Adaptive Finite Element Methods for Newtonian and Non-Newtonian Fluid Flows</i> , Korea Research Foundation (KRF), 58,262,000 won.
(As collaborator) |
| 2008.05-2009.05 | <i>Mixed Finite Volume Method for Signorini's Problem</i> ,
Kangwon National University, 9,000,000 won. |
| 2003.05-2004.04 | <i>Discontinuous Finite Element Methods with Application to Fluid Flow in Porous Media</i> , Korea Science & Engineering Foundation (KOSEF), \$20,172. |

Publication in Journals

1. K.-Y. Kim, *Guaranteed A posteriori error estimator for high-order mixed finite elements*, submitted.
2. H.-C. Lee and K.-Y. Kim, *A posteriori error estimators for stabilized P_1 nonconforming approximation of the Stokes problem*, submitted.
3. K.-Y. Kim and H.-C. Lee, *A posteriori error estimators for nonconforming finite element methods of linear elasticity problem*, submitted.
4. K.-Y. Kim, *Explicit bounds for the two-level preconditioner of the P_1 discontinuous Galerkin method on rectangular meshes*, J. KSIAM 13 (2009), no. 4, 267-280.
5. K.-Y. Kim, *Mixed finite volume method on non-staggered grids for the Signorini problem*, J. KSIAM 12 (2008), no. 4, 249-260.
6. Kwang Y. Kim, *A posteriori error estimators for locally conservative methods of nonlinear elliptic problem*, Appl. Numer. Math. 57 (2007), no. 9, 1065-1080.
7. Kwang Y. Kim, *A posteriori error analysis for locally conservative mixed methods*, Math. Comp. 76 (2007), no. 257, 43-66.
8. Kwang Y. Kim, *Analysis of some low-order nonconforming mixed finite elements for linear elasticity problem*, Numer. Methods Partial Differential Equations 22 (2006), no. 3,

638-660.

9. Kwang Y. Kim, *New mixed finite volume methods for second order elliptic problems*, ESAIM: M2AN 40 (2006), no. 1, 123-147.
10. Kwang Y. Kim, *Error estimates for a mixed finite volume method for the p -Laplacian problem*, Numer. Math. 101 (2005), no. 1, 121-142.
11. Kwang Y. Kim, *Mixed finite volume method for nonlinear elliptic problems*, Numer. Methods Partial Differential Equations 21 (2005), no. 4, 791-809.
12. So-Hsiang Chou, Do Y. Kwak and Kwang Y. Kim, *Mixed finite volume methods on non-staggered quadrilateral grids for elliptic problems*, Math. Comp. 72 (2003), no. 242, 525-539.
13. So-Hsiang Chou, Do Y. Kwak and Kwang Y. Kim, *Flux recovery from primal hybrid finite element methods*, SIAM J. Numer. Anal. 40 (2002), no 2, 403-415.
14. So-Hsiang Chou, Do Y. Kwak and Kwang Y. Kim, *A general framework for constructing and analyzing mixed finite volume methods on quadrilateral grids: the overlapping covolume case*, SIAM J. Numer. Anal. 39 (2001), no 4, 1170-1196.
15. Do Y. Kwak and Kwang Y. Kim, *Mixed covolume methods for quasi-linear second-order elliptic problems*, SIAM J. Numer. Anal. 38 (2000), no 4, 1057-1072.

Conference Talks

1. *A posteriori error estimator for quadrilateral nonconforming finite element method of linear elasticity*, 6th International Conference on Scientific Computing and Applications, Pusan National University, June 2-5, 2008.
2. *Efficient a posteriori error estimators for adaptive finite element methods*, Korean Mathematical Society, Keimyung University, April 26, 2008.
3. *Additive Schwarz preconditioner for interior penalty methods*, Workshop on Dynamical Systems and Related Fields, Ajou University, February 18-19, 2008.
4. *A posteriori error estimators for locally conservative methods*, The 3rd East Asia SIAM Conference, Xiamen, China, November 2-5, 2007.
5. *A posteriori error estimators for nonconforming finite element methods of linear elasticity problem*, Korean Mathematical Society, Korea Advanced Institute of Science and Technology, October 20-21, 2007.
6. *A posteriori error estimators for P_1 nonconforming approximation of quasi-Newtonian Stokes flows*, KSIAM 2005 Conference in Spring, Seoul National University, May 20-21, 2005.
7. *A posteriori error analysis for locally conservative mixed methods*, KSIAM 2004 Annual Meeting and Conference, Gyeongju, South Korea, December 3-4, 2004.

Colloquia and Seminar Talks

1. *Finite volume methods for elliptic and hyperbolic problems*, Hanyang University, May 6, 2008.
2. *A posteriori error estimators and adaptive mesh refinement*, Korea Advanced Institute of Science and Technology, March 30, 2007.
3. *Mixed finite volume methods on non-staggered quadrilateral grids*, ICES, University of Texas at Austin, February 16, 2007.
4. *A posteriori error estimators for P_1 nonconforming element*, Yonsei University, April 29, 2005.
5. *Discontinuous Galerkin methods: an Introduction*, Korea Advanced Institute of Science and Technology, June 4, 2004.

Teaching Experience

Kangwon National University

Fall 2009	Numerical Analysis, Real Analysis II Advanced Analysis II (graduate course)
Spring 2009	Calculus I, Advanced Calculus I, Methods of Applied Mathematics, Numerical Analysis (graduate course)
Fall 2008	Linear Algebra II Partial Differential Equations (graduate course)
Spring 2008	Calculus I, Linear Algebra I, Methods of Applied Mathematics

Sejong University

Fall 2006	Calculus I & II
Spring 2006	Calculus I & II

Korea Advanced Institute of Science and Technology

Fall 2004	Nonlinear Partial Differential Equations (graduate course)
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