Eun-Hee Park

Curriculum Vitae

KAIST
Daejeon, South Korea
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Research Interest

Domain decomposition methods, numerical methods for partial differential equations, parallel computing

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Education

Jan. 2009 **Ph.D., Mathematical Sciences**, *KAIST*, Daejeon, South Korea.
- Title: *A dual iterative substructuring method with a penalty term*
- Advisor: Professor Chang-Ock Lee

Feb. 2003 **M.S., Applied Mathematics**, *KAIST*, Daejeon, South Korea.
- Title: *A Least-Squares domain decomposition method for the Poisson problem*
- Advisor: Professor Chang-Ock Lee

Feb. 2001 **B.S., Mathematics Education**, *Pusan National University*, Busan, South Korea.
- Summa cum laude in Mathematics Education
- Obtained a secondary teaching certificate

Employment

Nov. 2013 – present **Research Assistant Professor**.
- Supported by National Research Foundation of Korea (NRF) Presidential Post-Doc fellowship
- Department of Mathematical Sciences, KAIST, South Korea

Sept. 2012 – Oct. 2013 **KRCF Research Fellow**.
- Supported by Korea Research Council of Fundamental Science and Technology (KRCF) fellowship and National Institute for Mathematical Sciences (NIMS) research grants
  - Extreme-scale Computing Research Team, Division of Computational Sciences in Mathematics, NIMS, January 2013 - October 2013
  - Numerical Program Research Team, Division of Computational Sciences in Mathematics, NIMS, September 2012 - December 2012

Sept. 2010 – Aug. 2012 **CCT Post-doctoral Research Fellow**.
- Under the supervision of Professor Susanne C. Brenner
- Joint appointment in Center for Computation and Technology (CCT) and Department of Mathematics, Louisiana State University, USA

Sept. 2009 – Aug. 2010 **NRF Post-doctoral Research Fellow**.
- Under the supervision of Professor Susanne C. Brenner and supported in part by NRF fellowship
- Joint appointment in CCT and Department of Mathematics, Louisiana State University, USA

Mar. 2009 – **BK21 Post-doctoral Research Fellow**.
Aug. 2009 ○ Under the supervision of Professor Chang-Ock Lee
○ Natural Science Research Institute, KAIST

Awards and Fellowships

2013 **NRF Presidential Post-Doc Fellowship**.
○ Awarded by NRF, November 2013 – October 2018

2012 **KRCF Research Fellowship for Young Scientists**.
○ Awarded by KRCF, September 2012 – August 2014

2011 **ICIAM 2011 Travel Grant for Young US Researchers**.
○ Awarded by SIAM (NSF)
○ ICIAM (International Congress on Industrial and Applied Mathematics) 2011 to be held in Vancouver, Canada on July, 2011

2009 **NRF Post-doctoral Fellowship**.
○ Awarded by NRF, September 2009 – August 2010
○ Title: Dual iterative substructuring methods based on discontinuous Galerkin methods

2008 **KSIAM Young Researcher Award**.
○ Awarded by Korean Society for Industrial and Applied Mathematics (KSIAM)
○ Title: A dual iterative substructuring method with a penalty term

Scholarships

2001 – 2008 **KAIST**, Daejeon, South Korea.
○ Government scholarship

1996 – 2000 **Pusan National University**, Busan, South Korea.
○ Full scholarship funded by the Ministry of Education, fall 1996 – fall 1997, spring 1999 – fall 2000
○ University scholarship, spring 1996

Research Grants

2013-2018 Principal Investigator, National Research Foundation of Korea Grant, NRF-2013R1A6A3A04058166

2009-2010 Principal Investigator, National Research Foundation of Korea Grant, NRF-2009-352-C00009

Academic Experience

2012 **Louisiana State University**, Baton Rouge, USA.
○ Instructor
- Domain Decomposition Methods (MATH4997-5): Nonoverlapping Domain Decomposition Methods

2001 – 2008   **KAIST**, Daejeon, South Korea.
- Teaching Assistant
  - Introduction to Linear Algebra (MA109)
  - Differential Equations and Applications (MA201)
- Grader
  - Introduction to Applied Mathematics (AM210)
  - Applied Matrix Computation (AM504)
  - Advanced Numerical Analysis (AM520)
  - Analysis II (MAS242)
  - Numerical Analysis (MAS565)

Referee

Journal of the Korean Mathematical Society

Mathematics of Computation

Professional Organizations

Member, Korean Mathematical Society

Member, Korean Society for Industrial and Applied Mathematics

Member, Society for Industrial and Applied Mathematics

Publications

Journal Articles in Print

- Susanne C. Brenner, Eun-Hee Park, and Li-Yeng Sung, *A balancing domain decomposition by constraints preconditioner for a weakly over-penalized symmetric interior penalty method*, Numer. Linear Algebra Appl., 20, 472-491 (2013)
- Chang-Ock Lee and Eun-Hee Park, *A dual iterative substructuring method with a penalty term in three dimensions*, Comput. Math. Appl., 64, 2787-2805 (2012)
- Andrew T. Barker, Susanne C. Brenner, Eun-Hee Park, and Li-Yeng Sung, *Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method*, J. Sci. Comput., 47, 27-49 (2011)
- Hyea Hyun Kim, Chang-Ock Lee, and Eun-Hee Park, *On the selection of primal unknowns for a FETI-DP formulation of the Stokes problem in two dimensions*, Comput. Math. Appl., 60, 3047-3057 (2010)
- Chang-Ock Lee, Chae Hun Leem, Eun-Hee Park, and Jae Boum Youm, *Absolutely stable explicit schemes for reaction systems*, J. Korean Math. Soc. 47, 165-187 (2010)
- Hyea Hyun Kim, Chang-Ock Lee, and Eun-Hee Park, *A FETI-DP formulation for the Stokes problem without primal pressure components*, SIAM J. Numer. Anal. 47, 4142-4162 (2010)
- Chang-Ock Lee and Eun-Hee Park, *A dual iterative substructuring method with a penalty term*, Numer. Math. 112, 89-113 (2009)

Articles in Refereed Proceedings

○ Andrew T. Barker, Susanne C. Brenner, Eun-Hee Park, and Li-Yeng Sung, *A nonoverlapping DD preconditioner for a weakly over-penalized symmetric interior penalty method*, in: R. Bank, M. Holst, O. Widlund, and J. Xu (eds.) Domain Decomposition Methods in Science and Engineering XX, Lecture Notes in Computational Science and Engineering, 91, 257-264, Springer, Heidelberg (2013)

○ Chang-Ock Lee and Eun-Hee Park, *A domain decomposition method based on augmented Lagrangian with a penalty term in three dimensions*, in: Y. Huang, R. Kornhuber, O. Widlund, and J. Xu (eds.) Domain Decomposition Methods in Science and Engineering XIX, Lecture Notes in Computational Science and Engineering, 78, 399-406, Springer, Heidelberg (2011)

○ Chang-Ock Lee and Eun-Hee Park, *A domain decomposition method based on augmented Lagrangian with a penalty term*, in: M. Bercovier, M.J. Gander, R. Kornhuber, and O. Widlund (eds.) Domain Decomposition Methods in Science and Engineering XVIII, Lecture Notes in Computational Science and Engineering, 70, 339-346, Springer, Berlin (2009)

Articles in Press

○ Andrew T. Barker, Susanne C. Brenner, Eun-Hee Park, and Li-Yeng Sung, *A one-level additive Schwarz preconditioner for a discontinuous Petrov-Galerkin method*, to appear in the Proceedings of Domain Decomposition Methods in Science and Engineering XXI

○ Hyea Hyun Kim, Chang-Ock Lee, and Eun-Hee Park, *Recent advances in domain decomposition methods for the Stokes problem*, to appear in the Proceedings of Domain Decomposition Methods in Science and Engineering XXI

Conference Organization

- Local organizer of the 23rd International Conference on Domain Decomposition Methods, Jeju Island (South Korea), June 22-26, 2015
- Local organizer of NIMS Workshop on Uncertainty Quantification in Mathematics and Sciences, Daejeon (South Korea), November 7-8, 2013
- Organizer of NIMS Workshop on Finite Element Methods and Efficient Solvers, Daejeon (South Korea), October 25, 2012

Research Presentations

Conference Talks

- A non-overlapping domain decomposition method for a discontinuous Galerkin method, KSIAM Annual Meeting 2013, Jeju (South Korea), November 22-24, 2013
- A FETI-DP method for a discontinuous Galerkin method, 22nd International Conference on Domain Decomposition Methods, Lugano (Switzerland), September 16-20, 2013.
- A domain decomposition method based on augmented Lagrangian with an optimized penalty parameter, 22nd International Conference on Domain Decomposition Methods, Lugano (Switzerland), September 16-20, 2013.

- Domain decomposition preconditioners for a discontinuous Galerkin method, Workshop on Finite Element Methods and Their Applications, Cheongpyung (South Korea), August 16-19, 2013
- A dual iterative substructuring method with an optimized penalty parameter, The Asian Mathematical Conference 2013, Busan (South Korea), June 30 - July 4, 2013
- A domain decomposition preconditioner for a discontinuous Galerkin method, KWMS International Conference 2013, Seoul (South Korea), June 20-21, 2013
- A domain decomposition method with an optimized penalty paramter, 14th International Conference on the Mathematics of Finite Elements and Applications, Uxbridge (England), June 10-14, 2013
- A dual iterative substructuring method with an optimized penalty parameter, KSIAM 2013 Spring Conference, Seoul (South Korea), May 24-25, 2013
- A nonoverlapping domain decomposition preconditioner for a discontinuous Galerkin method, International Workshop on Computational Mathematics - Advances in Computational PDEs, Seoul (South Korea), March 27-28, 2013
- A nonoverlapping domain decomposition preconditioner for a symmetric interior method, NIMS Workshop on Groundwater Modeling and Simulation, Daejeon (South Korea), November 26, 2012
- Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method, KSIAM 2012 Annual Meeting, Daegu (South Korea), November 23-24, 2012
- A BDDC preconditioner for a symmetric interior penalty Galerkin method, 21st International Conference on Domain Decomposition Methods, Rennes (France), June 25-29, 2012
- A nonoverlapping domain decomposition preconditioner for a symmetric interior penalty Galerkin method, poster session, 2012 Barrett Lectures: Recent Developments in Discontinuous Galerkin Finite Element Methods for Partial Differential Equations, Knoxville (USA), May 9-11, 2012
- A nonoverlapping domain decomposition preconditioner for a symmetric interior penalty Galerkin method, 2012 SIAM Southeastern Atlantic Section Conference, Huntsville (USA), March 24-25, 2012
- A nonoverlapping domain decomposition preconditioner for a symmetric interior penalty Galerkin method, 2012 Finite Element Rodeo, Houston (USA), March 2-3, 2012
- A nonoverlapping domain decomposition preconditioner for a symmetric interior penalty Galerkin method, SCALA 2012, Baton Rouge (USA), January 20-21, 2012
- A nonoverlapping domain decomposition preconditioner for a symmetric interior penalty Galerkin method, Joint Mathematics Meetings, Boston (USA), January 4-7, 2012
- A BDDC preconditioner for a weakly over-penalized symmetric interior penalty method, KSIAM Annual Meeting 2011, Jeju (South Korea), November 25-27, 2011
- A BDDC preconditioner for a symmetric interior penalty method, Fall 2011 Finite Element Circus, Groton (USA), October 14-15, 2011

- A BDDC preconditioner for a weakly over-penalized symmetric interior penalty method, ICIAM 2011, Vancouver (Canada), July 18-22, 2011
- A nonoverlapping domain decomposition preconditioner for a weakly over-penalized symmetric interior penalty method, 20th International Conference on Domain Decomposition Methods, San Diego (USA), February 7-11, 2011
- Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method, poster session, IMA Annual Program Year Workshop (Numerical Solutions of Partial Differential Equations: Fast Solution Techniques), Minneapolis (USA), November 29 - December 3, 2010
- Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method, Cha-Cha Days 2010, Charleston (USA), September 24-26, 2010
- Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method, 2010 Finite Element Rodeo, Dallas (USA), March 5-6, 2010
- Two-level additive Schwarz preconditioners for a weakly over-penalized symmetric interior penalty method, SCALA (Scientific Computing Around Louisiana) 2010, Baton Rouge (USA), February 5-6, 2010
- A dual iterative substructuring method in three dimensions, Joint Mathematics Meetings, San Francisco (USA), January 13-18, 2010
- A dual iterative substructuring method in three dimensions, 2009 International Conference for Women in Mathematics, Seoul (South Korea), June 18-19, 2009
- A dual iterative substructuring method with a penalty term in three dimensions, KSIAM 2008 Annual Meeting, Suanbo (South Korea), November 28-29, 2008
- A dual iterative substructuring method with a penalty term, 6th International Conference on Scientific Computing and Applications, Pusan (South Korea), June 2-5, 2008
- A dual iterative substructuring method with a penalty term, KSIAM 2008 Spring Conference, Pohang (South Korea), May 30-31, 2008
- A dual iterative substructuring method with a penalty term, 18th International Conference on Domain Decomposition Methods, Jerusalem (Israel), January 12-17, 2008
- An iterative substructuring method with Lagrange multipliers, KSIAM 2007 Spring Conference, Daejeon (South Korea), May 25-26, 2007

Invited Seminar Talks

- An introduction to domain decomposition methods, CSE Seminar, Yonsei University, Seoul (South Korea), September 26, 2013.
- Two-level additive Schwarz preconditioners for a weakly over-penalized interior penalty method, Applied Mathematics Seminar, KAIST, Daejeon (South Korea), July 7, 2010

Other Conferences and Workshops Attended

- Center for Mathematical Challenges Inaugural Conference, Daejeon (South Korea), December 5-6, 2013

- Supercomputing Summer School on Accelerator Programming, Yongin (South Korea), August 19-22, 2013
- 2013 NIMS Summer School on Isogeometric Analysis, Daejeon (South Korea), July 10-12, 2013
- NIMS Hot Topics Workshop on Special Highlights on Mathematical Biology, Daejeon (South Korea), June 3-5, 2013
- IBS Symposium on Scientific Computing, Seoul (South Korea), February 14, 2013
- SC 12 Conference (International Conference for High Performance Computing, Networking, Storage and Analysis), Salt Lake City (USA), November 10-16, 2012
- Spring 2012 Finite Element Circus, Piscataway (USA), April 13-14, 2012
- IMA Annual Program of Thematic Year on Simulating Our Complex World: Modeling, Computation and Analysis, September 1, 2010 - June 30, 2011, Minneapolis (USA)
· Participation supported in part by the Institute for Mathematics and its Applications (IMA) with funds provided by the NSF
· Tutorial/Workshop: Large-scale Inverse Problems and Quantification of Uncertainty, June 5-10, 2011
· Workshop: Societally Relevant Computing, April 11-15, 2011
· Workshop: Computing in Image Processing, Computer Graphics, Virtual Surgery, and Sports, March 7-11, 2011
· Workshop: Numerical Solutions of Partial Differential equations: Fast Solution Techniques, November 29 - December 3, 2010
· Tutorial: Fast Solution Techniques, November 28-29, 2010
· Workshop: Numerical Solutions of Partial Differential equations: Novel Discretization Techniques, November 1-5, 2010
· Tutorial: Some Novel Discretization Techniques, October 30-31, 2010
- 2011 Finite Element Rodeo, College Station (USA), February 25-26, 2011
- SCALA (Scientific Computing Around Louisiana) 2011, New Orleans (USA), January 28-29, 2011
- Finite Element Circus Featuring a Scientific Celebration of Falk, Pasciak, and Wahlbins, Minneapolis (USA), November 5-6, 2010
- Spring 2010 Finite Element Circus, Providence (USA), April 30 - May 1, 2010
- KSIAM 2009 Spring Conference, Seoul (South Korea), May 29-30, 2009