

## Curriculum Vitae - Saeja O. Kim

Department of Mathematics  
University of Massachusetts Dartmouth  
285 Old Westport Road  
North Dartmouth, MA 02747

skim@umassd.edu  
<http://www.math.umassd.edu/~skim/>  
(508) 999-8325 (Work)  
(508) 910-6917 (Fax)

### HIGHER EDUCATION

Ph.D.	Mathematics	May 1988	University of Illinois, Urbana-Champaign
M.S.	Mathematics	May 1985	Brown University, Providence RI
B.S.	Mathematics	Feb. 1975	Seoul National University, Seoul Korea ( <i>Magna Cum Laude</i> )

Thesis: "Projective Resolutions of Generic Order Ideals"  
Advisor: Professor Daniel R. Grayson

### ACADEMIC POSITIONS

(all at the University of Massachusetts Dartmouth)

2014-Present	Chairperson	Department of Mathematics
2013-2014	Acting Chairperson	Department of Mathematics
2011-Present	Professor	Department of Mathematics
1997-2011	Associate Professor	Department of Mathematics
1993-1997	Assistant Professor	Tenured in 1996
1990-1993	Full Time Lecturer	Department of Mathematics

### OTHER EXPERIENCE

Jan.2000 -June 2000	Visiting Scientist	Department of Mathematics Brown University, Providence, RI
Aug. 1988 -May 1989	Visiting Scholar	Department of Mathematics University of Illinois Urbana-Champaign
Aug. 1988 -Jan. 1989	Consultant	Wolfram Research Institute Champaign, IL
Mar. 1988 -June 1988	Post Doctoral Fellow	Department of Mathematics Harvard University, Cambridge, MA

## RESEARCH INTERESTS

Computational Algebra, Edge Detection, Radial Basis Functions, Matrix Algebra, Scientific Computing, Inverse problems, Computational Mathematics Education

## PUBLICATIONS

- Y. Chen, G. Davis, S. Gottlieb, A. Hausknecht, A. Heryudono, S. O. Kim, “Transformation of a Mathematics Department’s Teaching and Research through a Focus on Computational Science”, *Journal of Computational Science Education*, vol. 4, Issue 1, 24-29, Nov. 2013
- J.-H. Jung, S. Gottlieb, S. O. Kim, “Iterative adaptive RBF methods for detection of edges in two dimensional functions,” *Applied Numerical Mathematics*, doi:10.1016/j.apnum.2010.08.006, Aug. 2010, vol. 61, 2011, 77-91.
- S. Gottlieb, J.-H. Jung, S. O. Kim, “A Review of David Gottlieb’s work on the Resolution of the Gibbs phenomenon,” *Communications in Computational Physics*, doi: 10.4208/cicp.301109.170510s, vol. 9, No. 3, 497-519, March 2011.
- S. O. Kim, Y.Y. Earmme, K.-S. Kim, “Useful Conservation Sums in Molecular Dynamics and Atomistics,” *Mathematics and Mechanics of Solids*, doi:10.1177/1081286509357338, vol.15, No. 8, 885- 895, November 2010.
- J.-H. Jung, S. Gottlieb, S. O. Kim, C. L. Bresten, D. Higgs, “Recovery of high order accuracy in radial basis function approximation of discontinuous problems,” *Journal of Scientific Computing*, doi: 10.1007/s10915-010-9360-7, vol. 45, 2010, 359-381.
- B. C. Burke, S. O. Kim, K.-S. Kim, “Partial Polar decomposition inverse method applied to determination of internal stresses in an elastic complex structure,” *International Journal of Solids and Structures*, vol. 44, 2007, 2010-2020.
- S. O. Kim, “Projective Resolutions of Generic Order Ideals,” *Journal of Algebra*, vol. 191 (no.1), 1997, 279-330.
- S. O. Kim, “Connectedness of a Variety generated by an Order ideal on the punctured spectrum,” *Communications in Algebra*, vol. 24 (no.9), 1996, 2931-2943.
- S. O. Kim, “Repairing Non-commutative Diagrams,” *Journal of Algebra*, vol. 161(no.2), 1993, 311-323.
- Gary E. Davis, Christina E. Distefano, and Saeja O. Kim, “Sub-Additivity of Matrix Energy for Hermitian Matrix,” Preprint, 2009

## GRANTS

- AWM-NSF Travel Grant \$2,900 to present my works at the contributed sessions of International Congress of Mathematicians (ICM 2014), Aug. 13-21, 2014, Seoul, Korea and

to attend International Congress of Women Mathematicians (ICWM 2014), Aug. 12/14, 2014, Seoul Korea.

- Provost Travel Grant \$500 to present my works at ICM2014.
- CAS Dean's Travel Grant \$1,000 to present my works at ICM2014.
- CAS Dean's Travel Grant \$1,000 to attend invited 5-day workshop at BIRS), Banff, Canada, July 15- 19, 2013 .
- PI: NSF: NSF/CBMS Regional Conference on "Radial Basis Functions: Mathematical Developments and Application - 06/20/2011- 06/24/2011," 10/01/10-09/30/11, \$35,000, Co-PIs: S. Gottlieb, A. Heryudono, & C. Wang.
- Co-PI: AFOSR: "DURIP: A heterogeneous terascale computing cluster for the development of GPU optimized high order numerical methods", 07/15/10-07/14/11, \$199,800, PI: Sigal Gottlieb (et al)
- Senior Personnel: NSF: "MRI-R2: Acquisition of a Heterogeneous Terascale Shared Campus Computing Facility", 06/01/10-06/01/11, \$199,480, PI: Robert T. Fisher (et al)
- Senior Personnel: "RUI: Discovery Research K-12: Developing Algebra-Ready Students for Middle School: Exploring the Impact of Early Algebra", 09/01/09-08/31/12, \$1,578,668, PI: Maria Blanton.
- Provost Travel Grant: \$1000 to attend ICIAM2011
- CAS Dean's Travel Grant: \$1000 to attend ICIAM2011
- Co-PI: UMass Dartmouth Provost Departmental/Program Seminar Series: "Undergraduate Seminar Series on Computational Sciences," Academic Year 2010-2011, \$1,000, PI: Gary Davis
- PI: UMass Dartmouth Faculty Research Grant: "Algebraic Structure Identification of Optimal Inversion for Linear Inverse Problems", 07/1/09-06/30/10, \$2,000
- PI: UMass Dartmouth Provost Departmental/Program Seminar Series: "Undergraduate Seminar Series on Computational Sciences", 09/1/09-05/31/10, \$1,000, Co-PI: Alfa Heryudono
- Provost Travel Fund \$500 to attend the Route 81 Conference, Cornell University, 2004.

## **HONORS**

- Selected as the coach for RI State MATHCOUNTS Team for the National Competition in 2007, 2006, 2002, 1996, and 1995.
- Recognized for excellence in teaching by having biography published in the 2005-2006 10<sup>th</sup> Annual Edition of "Who's Who Among America's Teachers".

## **PROFESSIONAL MEETINGS**

- Workshop Invited Participant, "Mathematics of Lattices and Cybersecurity," the Institute for Computational and Experimental Research in Mathematics (ICERM), April 21-24, 2015.

- Workshop Invited Participant, "Mathematics of Data Analysis," ICERM, October 22 – 24, 2014.
- Session Chair, "Mathematics Education and Popularization of Mathematics", SC18-02, ICM2014, Aug. 19, 2014, Seoul, Korea.
- Conference Session Co-Chair, Industrial and Applied Mathematics I, UKC 2013(US-Korea Conference on Science, Technology, and Entrepreneurship), Aug. 8, 2013.
- Workshop Invited Participant, 5-Day Workshop, "Mathematics and Mechanics in the Search for New Materials," Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada, July 15- 19, 2013.
- Co-Organizer, Minisymposium, "Creating a dynamic undergraduate research environment in Scientific computing," 2 sessions, SIAM CSE 2013, Boston, MA, Feb. 25-Mar.1, 2013, Co-Organizers: A. Heryudono, A. Hausknect, G.Davis.
- Invited Participant, NSF/CBMS Regional Conference on "NSF/CBMS Conference: Finite Element Exterior Calculus (FEECJ)", 06/11/2012- 06/15/2012, ICERM), Brown University, Providence RI.
- Co-Organizer, NSF-CBMS Conference, "Radial Basis Functions: Mathematical Developments and Applications," UMass Dartmouth, North Dartmouth, MA, June 20-June 24, 2011, Co-Organizers: G. Gottlieb, A. Heryudono, C. Wang.
- Co-Organizer, Minisymposium, "High Order Numerical Methods for PDEs", 3 sessions, SIAM Annual Meeting, Pittsburgh, PA, July, 12-16, 2010, Co-Organizers: A. Heryudono, G. Gottlieb, C. Wang.
- Session Chairperson for Contributed Papers at the Conference of AMS, San Antonio, TX, January 1993.

### **INVITED TALKS & CONFERENCE PRESENTATIONS**

- S. Kim. "Symmetries and Conservation integrals of nonlocal elastic fields" at the International Congress of Mathematicians 2014 (ICM 2014), Aug. 18, Seoul, Korea.
- S. Kim. "Focus on computational mathematics as a vehicle for transformation of the educational experience, and its far reaching consequences at UMass Dartmouth", Joint work with Chen, Davis, Gottlieb, Hausknecht, & Heryudono, ICM 2014, Aug. 19, Seoul.
- S. Gottlieb, D. Higgs, S. Kim, "The role of parameters in oscillations and total variation behavior of WENO methods," MS101, 7<sup>th</sup> International Congress on Industrial & Applied Mathematics Conference (ICIAM 2011), Vancouver, Canada, July 16-23, 2011 (S. Kim is the presenter).
- S. Gottlieb, D. Higgs, S. Kim, "The effect of the stencil choosing sensitivity parameter on the total variation in WENO," MS252, 7<sup>th</sup> International Congress on Industrial & Applied Mathematics Conference (ICIAM 2011), Vancouver, Canada, July 16-23, 2011 (S. Kim is the presenter).
- S. Kim, J.-H. Jung, S. Gottlieb, "Detecting Edges in Two Dimensional Functions with Radial Basis Functions," Society for Industrial and Applied Mathematics (SIAM) Annual

Meeting, Pittsburgh, PA, July 12-16, 2010 (S. Kim is the presenter).

- S. Gottlieb, D. Higgs, S. Kim, “Stencil choosing sensitivity parameter in WENO,” SIAM Annual Meeting, Pittsburgh, PA, July 12-16, 2010 (S. Gottlieb is the presenter).
- Presented my colleague A. Heryudono’s work (joint work with T. Driscoll), “2D RBF Interpolation on Irregular Geometry through Conformal Transplantation,” SIAM annual meeting, July 12-16, 2010.
- J.-H. Jung, S. Gottlieb, S. Kim. “Iterative adaptive RBF methods for detection of edges in two dimensional functions” at the International Conference on Spectral and High Order Methods (ICOSAHOM), June 22-26, 2009, Norway (J.-H. Jung is the presenter).
- S. Gottlieb, J. H. Jung, S. Kim, C. Bresten, D. Higgs, “Recovery of high order accuracy via Gegenbauer reconstruction in radial basis function approximation for discontinuous problems,” The Fifth MIT Conference on Computational Fluid & Solid Mechanics, Cambridge, MA, June 17, 2009. (S. Gottlieb is the presenter).
- S. Kim, “Using Visual Aids, the Stella Octangula for the Group of Rotations of a Cube,” AMS-MAA Joint Annual Meeting, Orlando, FL, Jan. 10-13, 1996.
- S. Kim, “Eigenvectors and Axes of Symmetry,” AMS-MAA Joint Annual Meeting, Orlando, FL, Jan. 10-13, 1996.
- S. Kim, “Connectedness of a Variety generated by an Order ideal on the punctured spectrum,” AMS-MAA Joint Annual Meeting, San Antonio, TX, January 1993.
- S. Kim, “Repairing Noncommutative Diagrams,” AWM Workshop, Baltimore, MD, January, 1992.
- S. Kim, “Projective Resolutions of Generic Order Ideals,” AMS-MAA Joint Annual Meeting, 1992.

### **CONFERENCE/WORKSOP ATTENDED**

- Attended 2016 SIAM Annual Meeting, Boston, MA, July 11-15, 2016.
- Invited Participant of “Mechanics, Education and Research Universities: Perspectives for the 21st Century”, A Symposium to celebrate Choon Fong Shih (founding president of KAUST and former president of NUS) on the occasion of his 70th birthday, 12 May 2016, the American Academy of Arts and Sciences, MA.
- Attended "Workshop on deterministic and stochastic partial differentials equations", November 6 – 8, 2015, Brown University, Providence, RI.
- Attended the Finite Element Circus, Oct. 16-17, 2015, UMass Dartmouth
- Attended Arithmetic 2015: Silvermania on “Elliptic curves, Diophantine Geometry, and Arithmetic Dynamics”, Aug. 11-15, 2015, Brown University.
- Attended 2015 Symposium on the Application of Mechanics to Geophysics, two-day workshop at the Univ. of California San Diego (UCSD), Jan.17-18, 2015.
- Attended Conference: SIAM CSE13, Boston, MA, Feb. 25-Mar. 1, 2013.

- Attended the 12th International Congress on Mathematical Education (ICME-12), July 8-15, 2012, Seoul, Korea: invited participant in the symposium, “Improving 21st century mathematics education in conjunction with overseas Korean mathematicians.”
- Attended Northeastern section of MAA, Bridgewater State University, Nov. 2012.
- Attended Association for Women in Mathematics (AWM) 40<sup>th</sup> Anniversary Workshop, September 17-18, 2011, Brown University, Providence, RI.
- Master of Science Thesis Committee member for a Commonwealth Scholar in the Electrical and Computer Engineering, 2010.
- Attended 2009 SIAM Annual Meeting, July 6-10, 2009, Denver, Colorado.
- Attended Fifth MIT Conference on Computational Fluid & Solid Mechanics, June 17-19, 2009, Cambridge, MA
- 15th Annual Massachusetts Statewide Undergraduate Research Conference, UMass Amherst, May 1, 2009, Amherst, MA.
- Attended “Discrete Mathematics Days of the Northeast Conference,” April 5, 2008, Smith College, Northampton, MA.
- Attended “Discrete Mathematics Days of the Northeast Conference,” Sep. 15, 2007, Middlebury College, Breadloaf Campus, Ripton, Vermont.
- Attended Commutative Algebra Conference (honoring the contributions of Phillip Griffiths), Sept. 16- 18, 2005, University of Illinois at Urbana-Champaign.
- Participated in “The Route 81 Conference on Commutative Algebra & Algebraic geometry,” (in honor of Graham Evans), NY, Oct.2 - 3, 2004, Cornell University, Ithaca.
- Attended “The Proof Project,” Research Collaborative 2004, Providence, RI, Sep. 16-18, 2004.
- Attended MathFest, MAA Summer Meeting, Providence, RI, Aug. 12-24, 2004.
- Attended Number Theory Workshop, Brown University, Providence, RI, April 26-27, 2003.
- Attended RosenFest, Conference in Honor of the 60th Birthday of Michael Rosen, Brown University, Providence, RI, March 5-7, 1999.
- Attended A Mini-Conference on the Arithmetic of Function Fields, Brown University, Providence, RI, April 19-21, 1996.
- Invited Participant in the International Conference on Syzygies and Geometry, Northeastern University, Boston, MA, Oct. 9-11, 1995.
- Invited participant in the workshop on Number Theory and Fermat's Last Theorem, Boston University, Boston, MA, Aug. 9-18, 1995.
- Invited participant in NSF-CBMS Regional Conference on “Tight Closure, Big Cohen-Macaulay Algebras and Uniform Artin Rees Theorem, ” ND State University, Fargo, ND, June 25-29, 1995.
- Invited participant in The 21st Holiday Symposium on “Applying Groebner Bases to

Computing Projective Resolutions of Cyclic Modules," New Mexico State University, NM, Dec. 27-31, 1994.

- Invited Participant in The Abstract Algebra Workshop with ISETL at Purdue University, West Lafayette, June 9-18, 1994.
- Invited participant in AMS-IMS-SIAM Summer Research Conferences in the Mathematical Sciences, Commutative Algebra: Syzygies, Multiplicities and Birational Algebra, Mount Holyoke College, South Hadley, MA, July 1992.

## **PROFESSIONAL ACTIVITIES**

- Pi Day Live Phone Interview with Phil Paleologos on Mar. 14, 2015 & 2016.
- Panelist EMIRGE(Empowering Massachusetts Innovation and Research in Graduate Education) panelist (one of 4 panelist) Women in STEM Roundtable, April 30, 2016, on campus.
- Panelist Annual STEM4Girls, 6<sup>th</sup> annual STEM outreach event, May 21, 2016, UMass Dartmouth.
- Reviewer for 2015 UMass Dartmouth Summer Research Fellowship Program.
- Reviewer for 2015 CAS-EFS Grant Proposal, UMass Dartmouth.
- Reviewer for KSEA Young Investigator Grant (YIGs) 2015.
- Reviewer for The draft workshop report, "*Mathematics Curriculum, Teacher Professionalism, and Supporting Policies in Korea and the United States-Summary of a Workshop,*" at the invitation of Report Review Associate of the NRC's Policy and Global Affairs Division, 2014.
- Director of Assessment and Student Research of NSF-funded RUI: CSUMS: Research in Scientific Computing in Undergraduate Education (RESCUE) at UMass Dartmouth, 2008-2013.
- Serve as the General Secretary of Korean-American Mathematical Scientists Association (KAMSA),2013-2015.
- Faculty Co-Advisor (with Alfa Heryudono and Cheng Wang) for SIAM Student Chapter at UMass Dartmouth, 2010-2013.
- Referee for manuscripts submitted to Journal of Scientific Computing, 2010, 2011.
- Referee for manuscripts submitted to Applied Numerical Mathematics, 2011.
- Coach and Consultant (2008-2012) for Barrington Middle school MATHCOUNTS Team, 1994-2012, and Coach for RI State MATHCOUNTS Team for the National Competition (2007, 2006, 2002, 1996, 1995).
- Mathematics Department Liaison for NSF-funded Noyce Scholarship Program of the Center for University, School & Community Partnerships (CUSP) at UMass Dartmouth, 2008-2011.
- Panel Reviewer for 2010 Improving Teacher Quality (ITQ) State Grant, Department of

Higher Education, MA, Feb. 11, 2010.

- Korean-American Scientists & Engineers Association (KSEA) Third National Mathematics Competition 2004, Mathematics Exam Co-Chair, 2004.
- Reviewer for NSF proposal for mathematics in East Asia and Pacific Cooperative Program, 2000.
- Referee for a manuscript submitted to Educational Studies in Mathematics, 1999.
- Referee for a manuscript submitted to Research in Collegiate Mathematics Education, 1994.

### **COURSES TAUGHT**

- MTH 499/599: Cryptography
- MTH 496: Directed Study for MTH 442 (Modern Algebra II)
- MTH 463: Mathematical Modeling
- MTH 461: Elementary Topology
- MTH 441 & 442: Abstract Modern Algebra I & II
- MTH 311 & 312: Advanced Calculus I & II
- MTH 302: Elementary Number Theory
- MTH 298: Experiential Learning Program
- MTH 221: Linear Algebra
- MTH 111, 112 (MTH151, 152) & 211: Calculus I, II & III
- MTH 181 & 182: Discrete Structures I & II
- MTH 131 (MTH 150): PreCalculus
- MTH 103 (MTH 146): Finite Mathematics
- MTH 101 & 102 (MTH 148 & 149): College Algebra I & II (Brief Calculus)
- MTH 100: Basic College Algebra

### **UNDERGRADUATE STUDENTS MENTORED**

- Co-Advisor: Chris Bresten & Andrew Perry: “A Deniable Private Key Cryptosystem implemented in parallel Python”, Poster Session at 2009 SIAM Annual Meeting, Denver, Colorado, July 6-10, 2009, Advisors: Gary Davis, Jae-Hun Jung, and Saeja Kim.
- Co-advisor (with Luo) for HON 490-Honor’s thesis, entitled “Study of efficiency and Effectiveness of Enhanced MTH140 with extra 4<sup>th</sup> hour” by Hillary Havener.

## **MEMBERSHIP**

- American Mathematical Society (AMS)
- Society of Industrial and Applied Mathematics (SIAM)
- The Association for Women in Mathematics (AWM)
- Korean-American Scientists & Engineers (KSEA)

## **EXTERNAL COLLABORATORS**

- Jae-Hun Kim, SUNY at Buffalo
- Kyung-Suk Kim, Brown University
- Y.Y. Earmme, Korea Advanced Institute of Science and Technology, Korea

## **UNIVERSITY SERVICE**

- UMD Co-Representative to the Developmental Math Advisory Board, 2014-2015.
- Math Search and Screen Committee.
- Math Developmental Task Force.
- Team member for proposing PhD program in Computational Science. 2010-2011.
- Team member for proposing Center for Scientific Computing and Visualization (CSCVR), 2010-2011.
- Faculty Senate, 2012-2014.
- General Education Committee, 2010-2013.
- SIAM Student Chapter Advisor, 2011-2013.
- On the Advisory Board for Mathematics and Physics Opportunities for Women in Research (MPOWR), 2012-2013.
- Spring 2012 CONNECT MATH Representative of UMass Dartmouth.
- Faculty Federation Grievance Hearing Committee, 2008.