

Curriculum Vitae

Dr. Yeonhyang Kim

Personal Information

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Gender: Female

Education

Ph.D. Mathematics, University of Wisconsin-Madison, 2008.
Advisor: Amos Ron.
Title: Time Frequency Representations of Almost Periodic Functions.
Minor: Computer Sciences
M.A. Mathematics, University of Wisconsin-Madison, Dec. 2001.
Area: Analysis and Applied Math.
M.A. Mathematics, Pohang University of Science and Technology, South Korea,
Feb. 1996.
Area: Topology.
B.S. Mathematics, Duksung Women's University, South Korea, Feb. 1994.

Appointments

2013: Tenured Assistant Professor
Department of Mathematics, Central Michigan University
2008 - Present: Assistant Professor
Department of Mathematics, Central Michigan University
1999 - 2008: Teaching Assistant
Department of Mathematics, University of Wisconsin-Madison
1996 - 1998: Math Teacher for a Private Institution
Seoul, South Korea
1994 - 1996: Teaching Assistant
Department of Mathematics, Pohang University, South Korea

TEACHING

Teaching Experience

- MTH 696A, Fourier Transforms (Summer 2013), CMU.
- MTH 132H, Calculus I (Fall 2012), CMU.
- MTH 532, Advanced Calculus I (Fall 2012), CMU.

- MTH 636, Intro Complex Variables (Fall 2010), CMU.
- MTH 533, Advanced Calculus II (Spring 2010), CMU.
- MTH 217, Business Calculus (Spring 2012), CMU.
- MTH 133, Calculus II (Fall 2011), CMU.
- MTH 132, Calculus I (Fall 2009 - Spring 2011, Spring 2013 - Fall 2014), CMU.
- MTH 232, Linear Algebra and Differential Equations (Fall 2008, Fall 2009, Fall 2013), CMU.
- MTH 203, Mathematics: A Modeling Approach (Spring 2009), CMU.
- MTH 334, Differential Equations (Fall 2008, Spring 2009), CMU.
- Trigonometry (Fall 2005, Spring 2006), University of Wisconsin-Madison.
- Introduction to Splines and Wavelets (Spring 2005: Mentor), University of Wisconsin-Madison.
- Topics in Finite Mathematics (Fall 1999, Spring 2000, 2002), University of Wisconsin-Madison.
- Calculus (Spring 2003), University of Wisconsin-Madison.
- Calculus and Introduction to Differential Equations (Fall 2004), University of Wisconsin-Madison.
- Calculus and Analytic Geometry Part I (Fall 2000, Spring 2004), University of Wisconsin-Madison.
- Calculus and Analytic Geometry Part II (Spring 2001, Fall 2002), University of Wisconsin-Madison.
- Calculus and Analytic Geometry Part III (Fall 2001, Fall 2003), University of Wisconsin-Madison.
- Topology (1995), Pohang University, South Korea.

Attendance at conferences or meetings with a focus on teaching

- March 22, 2013, Teaching and Learning in scale-up-style Active Learning Classrooms, Brown Bag Lunch, CMU.
- October 26-28, 2012, The 2012 Trends in Undergraduate Research in the Mathematical Sciences (TURMS) Annual Conference, Rosemont, Illinois.
- August 2-4, 2012, MAA MathFest 2012, Madison, Wisconsin.
- May 9-11, 2012, CMU Great Lakes Conference on Teaching and Learning, CMU.
- May 4-5, 2012, The 2012 MAA Michigan Section Meeting, Saginaw Valley State University, MI.
- January 4-7, 2012, The Joint Mathematics Meetings, Boston, MA.
- November 2011, One-Hour Conference: Are Your Students Learning? Working with 21st Century Learners, CMU.

- November 2011, iPad in Learning: Exploring Innovative Approaches to Teaching, CMU.
- August 4-6, 2011, MAA MathFest 2011, Lexington, Kentucky.
- May 6-7, 2011, The Michigan Section of the MAA & MichMATYC, Western Michigan University, MI.
- February 12, 2010, Brown Bag Seminar, Ana Dias, Tibor Marcinek, Katrina Piatek-Jimenez, and Linda Smoke Department of Mathematics Central Michigan University Developing a Quantitative Reasoning Course at CMU
- January 13-16, 2010, The Joint Mathematics Meetings, San Francisco.
- May 8-9, 2009, The Michigan section meeting of the Mathematical Association of America (MAA), CMU.

Presentation of My students

- July 23, 2014, my CMU REU students gave a talk titled “Frames in Finite Dimensions” at the Summer Undergraduate Michigan Mathematics Research (SUMMR) conference, GVSU, MI.
- April 20, 2012, “Investigation of second generation wavelets”, my CMU LURE students presented as a poster at the 18th Annual Student Research & Creative Endeavors Exhibition (SRCEE), CMU.
- January 4-7, 2012, my CMU LURE students gave a talk titled “Investigation of second generation wavelets”, Contributed talk, The Joint Mathematics Meetings, Boston, MA.
- August 4-6, 2011, my CMU LURE students gave a talk titled “Investigation of second generation wavelets”, Contributed talk, MathFest 2011, Lexington, KY. They received one of the Outstanding Presentation Awards out of 103 undergraduate talks.
- July 25, 2011, my CMU LURE students gave a talk titled “Investigation of second generation wavelets” at the Summer Undergraduate Michigan Mathematics Research (SUMMR) conference, Hope College.
- January 13-16, 2010, my CMU REU students gave a talk titled “Modulation Frames and Dual Grammian Matrices” of our work in the Joint Mathematics Meetings, San Francisco.
- September 25, 2009, my CMU REU student, Robert Fraser, gave a talk titled “Modulation Frames and Dual Grammian Matrices” of our work in the 31st Annual Pi Mu Epsilon Student Conference, Dept. of Mathematics and Statistics, Miami University, Oxford, Ohio.
- July 20, 2009, my CMU REU students gave a talk titled “Modulation Frames and Dual Grammian Matrices” of our work in the Summer Undergraduate Michigan Mathematics Research (SUMMR) Conference, Central Michigan University.

Mentoring/Advising Students

- Advisor for Mathematics Major (Spring 2012 – Present)
 - Signed math majors, Spring 2012
- Academic advisor for graduate students (Spring 2009 – Present)
 - Fall 2013, Matthew Plante

- Fall 2013, Christal Ross
- Fall 2012, Keshab Raj Dahal
- Spring 2012, Zannon, Mohammad Salim Abid
- Fall 2011, Brad Pretzer
- Spring 2009, Jeremy Houser (Graduated in Summer 2011 with an M.A. degree)
- Independent study
 - Spring 2013, Dahal, Keshab Raj (MTH 697: Measure theory)
 - Spring 2012, Zannon, Mohammad Salim Abid (MTH 697: A lifted Haar basis)
 - Spring 2012, Zannon, Mohammad Salim Abid (MTH 797: Hilbert space)
 - Spring 2011, Houser, Jeremy A (MTH 597, Principles of Mathematical Analysis)
 - Spring 2011, Tallman, John D (MTH 597, Principles of Mathematical Analysis)
 - Spring 2011, Almeida, Gonsalge Sureka Nilmini (MTH 697, Principles of Mathematical Analysis)
 - Spring 2011, Anderson, Linda M (MTH 636, Intro Complex Variables)
 - Summer 2010, Burt, Sarah Lynn (MTH 636, Intro Complex Variables)
 - Fall 2009, Radhika Sundar(MTH 797, Functional analysis)
 - Summer 2009, Radhika Sundar (MTH 797, L_p space)
- CMU Honors Program senior project
 - Fall 2011, Michael Gustin(Investigation of second generation wavelets)
- Plan B Project
 - Summer 2014, Ross, Christal Lynn-Schoen (Time-Frequency Analysis)
 - Spring 2011, Houser, Jeremy A (Riemann Mapping Theorem)
- M.A./Ph.D. thesis committee
 - Spring 2014, Joshua Harvey, Ph. D. Dissertation
 - Spring 2012, Pablo Diez Burillo, Master thesis
 - Fall 2011, Yifan Zhang, Master thesis
 - Spring 2010, Clement Ampadu, Ph. D. Dissertation
- Senior personnel on a NSF LURE grant (Mentored a group of CMU LURE students), Central Michigan University, Summer 2011.
- Senior personnel on a NSF REU grant (Mentored a group of REU students), Central Michigan University, Summer 2009, Summer 2014.
- Wrote letters of recommendation for undergraduate and graduate students since 2010.
- Mentored a group of students in the Mentorship Program for Young Women in High School with an Interest in Math and Science, University of Wisconsin-Madison, Fall 2007.

- Mentored advanced undergraduate students in Image Smoothness and Denoising for the course “Intro to Splines and Wavelets”, University of Wisconsin-Madison, Spring 2005.

Curriculum development

- Spring 2014, Review the master course syllabus.
- Spring 2011, Along with Dr. Xiaoming Zheng, I developed a new course called Mathematical Biology, MTH 335.
- Spring 2009, I wrote the final version of the Mathematics Departments’s new proposed new majors, Mathematics Major with a Concentrations in Pure Mathematics and Mathematics Major with a concentration in Applied Mathematics.

Other activities for students

- Spring 2013, Participation in social activities of STRC

SCHOLARLY AND CREATIVE ACTIVITY
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Publications and Preprints (* indicates that the author was an undergraduate student)

1. Y. Kim, Wiener algebra and wavelet frames, in preparation.
2. I. Cha, H. Jeon, and Y Kim, Cha-Algebra for set theory, To be submitted.
3. K. Berry*, M. Copenhaver*, E. Evert*, Y. Kim, T. Klingler*, S. K. Narayan, and S. Nghiem*, Factor posets of frames and dual frames in finite dimensions, To be submitted.
4. X. Zheng, Y. Kim, L. Rakesh and E.-B. Lin, A conservative and variation preserving finite volume method for non-overlapping meshes of reaction and diffusion in angiogenesis, Accepted for publication in Journal of Computational and Applied Mathematics
5. M. Copenhaver*, Y. Kim, C. Logan*, K. Mayfield*, S. K. Narayan, M. J. Petro, and J. Sheperd*, Diagram vectors and tight frame scaling in finite dimensions, *Operators and Matrices*, **8** (2014), 78-88.
6. Y. Kim, Representations of almost-periodic functions by generalized shift-invariant systems in \mathbb{R}^d , *J. Fourier Anal. Appl.*, **19(4)**, (2013), 857-876.
7. M. Copenhaver*, Y. Kim, C. Logan*, K. Mayfield*, S. K. Narayan, and J. Sheperd*, Maximum Robustness and surgery of frames in finite dimensions, *Linear Algebra Appl.*, **439(5)** (2013), 1330-1339.
8. Y. Kim and M. J. Petro, Periodic matrices and Gabor frames, *Int. J. Appl. Math.*, **25(5)** (2012), 643-652.
9. Y. Kim, K. Cameron*, M. Gustin*, J. Holden*, and S. Sierveld*, A lifted Haar basis, *Int. J. Appl. Math.*, **25(2)** (2012), 219 - 231.
10. Y. Kim, M. J. Petro, A. Dugowson*, and R. Fraser*, Frame bounds for subspaces of $L_2(\mathbb{R})$, *Int. J. Pure Appl. Math.*, **75(4)** (2012), 285 - 401.

11. Y. Kim and A. Ron, Time frequency representation of almost-periodic functions, *Constr. Approx.*, **29(3)** (2009), 303 - 323.

Other scholarly/creative activities (Editing, refereeing, reviewing, etc)

- Review for Mathematical Reviews published by AMS: MR3175331, September, 2014.
- Review for Mathematical Reviews published by AMS: MR3070328, April, 2014.
- Referee for proceedings of 10th international conference on Sampling Theory and Applications, March 2013.
- Submitted a solution of the problem 11683 for Monthly, 119(10): 881, February 28, 2013.
- Review for Mathematical Reviews published by AMS: MR2912462, September 27, 2012.
- Referee for the journal of Advances in Computational Mathematics (ACOM-D-12-00130), 2012.
- Review for Mathematical Reviews published by AMS: MR2864368, June 22, 2012.
- Submit a solution of the problem 11636 for Monthly, 119(4): 344, April 16, 2012.
- Referee for Journal of Function Spaces and Applications (465364), March 30, 2012
- Review for Mathematical Reviews published by AMS: MR2776773, January 31, 2012.
- Referee for the journal of Inequalities and Applications, 2010.
- Transcribed and edited “Ideals over Hyperplane arrangements and Zonotopes” (lecture notes), UW-Madison, Fall 2006.

Grant Proposals

External Grants

1. NSF-REU site in Mathematics, August 2014, Pending. (The PI for this grant is Sivaram K. Narayan).
2. Banff International Research Station for Mathematical Innovation and Discovery, February, 2013, Not Funded
3. NSF-Division of Mathematical Sciences (Computational Mathematics), December 2012, Not Funded.
4. The AIM SQuaREs program, October 2012, Not Funded.
5. AWM-NSF Travel Grant, March 2009, Funded.

Internal Grants (Central Michigan University)

1. Faculty Research & Creative Endeavors Page Charge:
Spring 2012, Fall 2012, Funded.
2. Faculty Research & Creative Endeavors Premier Display Grant:
Spring 2009, Spring 2011, Spring 2012, Spring 2013, Funded.
3. Faculty Development Funds:
Spring 2009, Spring 2011, Spring 2012, Spring 2013, Spring 2014 Funded.

4. Early Career Investigator (ECI) Grants:
Fall 2010, Fall 2011, Funded. (The PI for this grant is Xiaoming Zheng).

Presentation of scholarly work

- July 18, 2014, I gave a talk titled “Finite Frames” at GVSU REU seminar as an invited speaker, Grand Vally State University, MI.
- May 23, 2014, I gave a talk titled “Wiener algebra and Gabor frames with infinite support” in the 5th International Conference on Computational Harmonic Analysis.
- April 25, 2014, I gave a talk titled “Wiener algebra and frames” in the CMU Analysis and Applied Mathematics Seminar.
- July 25, 2013, I gave a colloquium talk entitled “Gramian analysis for frames” in the Institute of Mathematical Science in Ewha W. University, South Korea.
- July 18, 2013, I gave a colloquium talk entitled “Wiener algebra” in the Institute of Mathematical Science in Ewha W. University, South Korea.
- June 30-July 4, 2013, I gave a talk titled “Periodic matrices and frames” in the The Asian Mathematical Conference 2013, BEXXO, Busan, Korea.
- November 17, 2012, “A lifted Haar basis” presented as a poster at the West Michigan Regional Undergraduate Science Research Conference, Van Andel Institute Graduate School, MI
- July 16-19, 2012, I gave a talk titled “Tight Frame Scaling Problem in \mathbb{R}^n ” in the Concentration Week in Frame Theory and Maps Between Operator Algebras, Texas A&M University, TX.
- July 6, 2012, I gave a talk titled “Tight frames in R^n ” at GVSU REU as an invited speaker, Grand Vally State University, MI.
- May 4-5, 2012, I gave a talk titled “Diagram vectors and Tight Frame Scaling in Finite Dimensions” in the 2012 MAA Michigan Section Meeting, Saginaw Valley State University, MI.
- March 17-18, 2012, I gave a talk titled “Diagram vectors and Tight Frame Scaling in Finite Dimensions”, Invited Talk, AMS special session on analysis of wavelets, frames, and fractals, George Washington University, Washington, DC.
- July 18-22, 2011, I gave a talk titled “A Mathematical Model Integrating Reactions and Diffusion at Different Scales and its Conservative Multiresolution Finite Volume Method” in the 7th International Congress on Industrial and Applied Mathematics - ICIAM 2011, Vancouver, BC, Canada.
- May 6-7, 2011, I gave a talk titled “Frames and Wiener algebras” in the 2011 meeting of the Michigan Section of the MAA & MichMATYC, Western Michigan University, MI.
- March 16, 2011, “A multiscale model of reaction and diffusion and a multiresolution numerical method ” presented as a poster at the Faculty Excellence Exhibition (FEE), Central Michigan University.

- * April 16, 2011, “A multiscale model of reaction and diffusion and a multiresolution numerical method”, Poster, SIAM Great Lake conference, Oakland University, Rochester, MI (I prepared the poster and presented by a coworker)
- February 23, 2010, I gave a talk titled “Analysis and its application” in the CMU Kappa Mu Epsilon, the mathematics honors society.
- June 14-20, 2009, I gave a talk titled “Representations of almost periodic functions using wavelet frames” in the international conference WAVELETS AND APPLICATIONS, Saint-Petersburg, Russia.
- June 1, 2009, I gave a talk titled “Large Frames and Infinite Quadratic Forms” in the CMU NSF funded Research Experiences for Undergraduates program, Central Michigan University.
- May 29, 2009, I gave a talk titled “Introduction to Frames” in the CMU NSF funded Long Term Undergraduate Research Experience (LURE) program, Central Michigan University.
- May 15-17, 2009, I gave a talk titled “The norm of almost periodic functions and wavelets” in the conference 20 Years of Wavelets, DePaul University, Chicago, Illinois.
- May 8-9, 2009, I gave a talk titled “ L_2 -frames and an almost periodic function space” at the Michigan section meeting of the Mathematical Association of America (MAA), Central Michigan University.
- Spring 2009, I gave a series of lectures titled “Frames for shift-invariant subspaces of $L_2(\mathbb{R}^d)$ ”, Central Michigan University.
- October 2, 2008, I gave a colloquium talk titled “Representations of almost periodic functions using $L_2(\mathbb{R}^d)$ -frames”, Central Michigan University.
- March 2007, I gave a talk titled “Time frequency representations of AP functions” in the Twelfth International Conference in Approximation Theory, San Antonio.
- June 2008, I gave a talk titled “Norm estimation of almost periodic functions using $L_2(\mathbb{R}^d)$ -frames”, University of Wisconsin-Madison.
- February 2008, I gave a colloquium talk titled “Wavelet Frames and Almost Periodic Functions”, Central Michigan University.
- March 2007, I gave a talk titled “Time frequency representations of AP functions” in the Twelfth International Conference in Approximation Theory, San Antonio.
- May 2006, I gave a talk for Specialty Exam, University of Wisconsin-Madison.
- 2001 - 2005, I gave talks at Student Seminars, University of Wisconsin-Madison.
 - Framelets and Almost Periodic Functions (Summer 2005).
 - Complex Wavelet Transform (Fall 2004).
 - Hilbert Transform Pairs of Wavelet Bases (Fall 2004).
 - Image Prediction by a Minimization Problem (Spring 2004).
 - Image Processing in General (Fall 2003).
 - Bi-framelet Construction in 2-Dimension (Spring 2003).
 - Nonlinear Approximation (Fall 2002).

- Design Approximation Problems for Linear-Phase Non Recursive Digital Filters (Spring 2002).
- Approximation Theory (Fall 2001).

Attendance at conferences and meetings with a focus on scholarship (excluding conferences listed above)

- July 19, 26, 2013, A special lecture about total variation minimization in the Institute of Mathematical Science in Ewha W. University, South Korea.
- June 17, 2013, A special lecture about box spline in the Institute of Mathematical Science in Ewha W. University, South Korea.
- April 20, 2013, Great Lakes section of the Society of Industrial and Applied Mathematics 2013 Conference, CMU
- July 20-22, 2012, Operator Algebras, Frames, and Undergraduate Research: A Conference in Honor of the 70th Birthday of David R. Larson, Texas A&M University, TX.
- August 2-4, 2012, MAA MathFest 2012, Madison, Wisconsin.
- May 8-10, 2012, ORSP External Proposal Writing Workshop, CMU.
- January 4-7, 2012, The Joint Mathematics Meetings, Boston, MA.
- August 4-6, 2011, MAA MathFest 2011, Lexington, Kentucky.
- July 25, 2011, Summer Undergraduate Michigan Mathematics Research (SUMMR) Conference, Hope College. This conference gives an opportunity for REU/LURE undergraduate students to give a talk on a topic of their own interest.
- January 13-16, 2010, The Joint Mathematics Meetings, San Francisco.
- November 14, 2009, The sixth meeting of the Illinois/Missouri Applied Harmonic Analysis Seminar, Saint Louis University, St. Louis, Missouri.
- July 20, 2009, Summer Undergraduate Michigan Mathematics Research (SUMMR) Conference, Central Michigan University.
- April 18-19, 2009, Midwest Conference on Mathematical Methods, Michigan State University.
- July 28-29, 2008, The NSF-LURE Math Conference, Central Michigan University.

SERVICE

Participating in departmental or university committees

- CST Strategic Planning Student Success - Support Infrastructure, Central Michigan University, September 2012 - August 2013
- Library Committee, Central Michigan University, August 2012 - August 2015

- By-Laws Committee, Mathematics department, Central Michigan University, September 2011 – Present
- Mathematics Department Graduate Committee, Mathematics department, Central Michigan University, September 2010 – August 2012
- Degrees, Awards, Honors, and Standards (DASH) Committee, Central Michigan University, September 2010 – August 2013
- Chair Review Committee, Mathematics department, Central Michigan University, Spring 2010, Spring 2011, Spring 2014 (Chair)
- Mathematics Curriculum Committee, Mathematics department, Central Michigan University, September 2009 – August 2010
- Precalculus Committee, Mathematics department, Central Michigan University, August 2008 – August 2010, August 2014 – Present
- Colloquium Speakers Committee, Mathematics department, Central Michigan University, August 2008 – August 2009

Participation in College and Departmental Colloquia

Brown Bag Seminar, College of Science and Technology, Central Michigan University, Spring 2010, Spring 2013.

Service for Mathematics department

- Qualifying Exam Committee (Analysis), Mathematics department, Central Michigan University, January 2011, August 2011, January 2012, May 2012, August 2013
- Organized and led problem-solving sessions (Spring 2013)
- Introduced use of WeBWorK and acted as a WeBWorK consultant (Fall 2010 – Present)
- Honors faculty member (Spring 2012 – January 2015)
- Represented the CMU Mathematics graduate program at the Graduate School Fair for undergraduate students, AMS Joint Meetings (January 2012)
- Trained a graduate student to support WeBWorK and prepared documentation (Fall 2011)
- Served on the masters thesis committee (Fall 2011, Spring 2012)
- Peer reviewed an online course for MTH132 (Spring 2011)
- Served on the Ph.D. Dissertation committee (May 2010)

Service for Professional Organizations

- Chaired one contributed talk session at Great Lakes section of the Society of Industrial and Applied Mathematics 2013 Conference, CMU, April 20, 2013
- Provided questions for Michigan Mathematics Prize Competition: May 2012

- Judge the MAA Undergraduate Poster Session:
January 2010, January 2012
- Grader in the 52nd, 53rd, and 56th Michigan Mathematics Prize Competition:
January 2009, January 2010, January 2013
- Proctor the Putnam Exam:
December 2008, December 2009.

Other Service

- Mathematics assistant in the Greater University Tutorial Program Volunteer Drop-in Tutor,
University of Wisconsin-Madison, Fall 2007
- Analysis Seminar Organizer, University of Wisconsin-Madison, Fall 1999.

Awards, Honors, and Others

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| April 2013 | Nominated for CST Outstanding Teaching Award
Central Michigan University |
| August 2011 | My CMU LURE group won the “Outstanding Presentation Award”
out of 103 student talks at the MAA MathFest 2011 meeting
at Lexington, KY. Each received a \$100 check |
| January 2010 | Nominated for CST Outstanding Teaching Award
Central Michigan University |
| May 2007 | Elizabeth Hirschfelder Award for Graduate Women in Mathematics,
Physics and Chemistry from Mathematics Department, \$2000,
University of Wisconsin-Madison |
| May 2003 | Superior TA Rating from Mathematics Department,
University of Wisconsin-Madison |
| 1992 - 1994 | Scholarships from Duksung Women’s University, South Korea |

Membership in Professional Organizations

- Member of American Mathematical Society
- Member of Mathematical Association of America

Collaborators and Other Affiliations

- A. Ron (Ph.D. Dissertation Advisor), Department of Mathematics, University of Wisconsin-Madison
- E. Lin, S.K. Narayan, L. Rakesh, X. Zheng, Department of Mathematics, Central Michigan University
- M. Petro, Computer Aided Engineering, University of Wisconsin-Madison
- I. Cha, H. Jeon, Hanyang High School Attached To the College of Education, Hanyang University

- Undergraduate students