

BRODY DYLAN JOHNSON

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PERSONAL INFORMATION

Born July 6, 1973, Battle Creek, Michigan, USA.

EDUCATION

- Ph.D. *Mathematics*, Washington University in Saint Louis, May 2002.
Dissertation: *Wavelets: generalized quasi-affine and oversampled-affine frames*.
Chairman: Guido L. Weiss.
- A.M. *Mathematics*, Washington University in Saint Louis, May 1999.
- M.S. *Mechanical Engineering*, Virginia Polytechnic Institute and State University, August 1997.
Thesis Title: *Control of broadband acoustic radiation from structures using a piezoelectric double-amplifier active-skin*.
- B.S. *Mechanical Engineering*, Virginia Polytechnic Institute and State University, May 1996,
Summa Cum Laude, Minor: *Mathematics*.

Attended: Hagerstown Junior College, Hagerstown, Maryland.
Southern Illinois University at Edwardsville, Edwardsville, Illinois.

PROFESSIONAL EXPERIENCE

- 2003- Saint Louis University, Saint Louis, Missouri.
Associate Professor, Department of Mathematics and Computer Science.
Assistant Professor, Department of Mathematics and Computer Science (2003-2009).
- 2002-2003 Georgia Institute of Technology, Atlanta, Georgia.
VIGRE Visiting Assistant Professor, School of Mathematics.

HONORS AND AWARDS

- 2009 Award for Outstanding Service to Undergraduate Students (SLU)
- 2008 William V. Stauder, S.J. Award for Excellence in Teaching in the Natural Sciences (SLU)
- 2006 SGA Faculty Excellence Award (SLU)
- 2005 SGA Faculty Excellence Award (SLU)
- 2001-2002 Dean's Dissertation Fellowship (WashU)
- 2001 Council of Students of Arts & Sciences Teaching Award (WashU)
- 2000-2001 Robert H. McDowell Award for Excellence in the Teaching of Mathematics (WashU)
- 1999-2000 Dean's Award for Teaching Excellence (WashU)
- 1996 Pratt Fellowship (VaTech)

GRANT(S)

2006 SLU Summer Research Award, *Multiresolution Structure for Rational Dilations*.

PREPRINT(S)

1. *Wavelets on the circle*, submitted.

PUBLICATIONS IN MATHEMATICS

8. *Frame potential and finite abelian groups*, (with Kasso A. Okoudjou) “Radon transforms, geometry, and wavelets,” *Contemp. Math.*, **464** (2008), 137–148.
7. *Stable filtering schemes with rational dilations*, *J. Fourier Anal. Appl.*, **13**(5) (2007), 607–621.
6. *Orthogonal wavelet frames and the vector-valued wavelet transform*, (with Ghanshyam Bhatt and Eric Weber) *Appl. Comput. Harmon. Anal.*, **23**(2) (2007), 215–234.
5. *The nonholonomy of the rolling sphere*, *Amer. Math. Monthly*, **114**(6) (2007), 500–508.
4. *Convolutional frames and the frame potential*, (with Matthew Fickus, Keri Kornelson, and Kasso A. Okoudjou) *Appl. Comput. Harmon. Anal.*, **19**(1) (2005), 77–91.
3. *Co-affine systems in \mathbb{R}^d* , “Wavelets, frames and operator theory,” *Contemp. Math.*, **345** (2004), 193–202.
2. *On the oversampling of affine wavelet frames*, *SIAM J. Math. Anal.*, **35**(3) (2003), 623–638.
1. *On the relationship between quasi-affine systems and the \grave{a} trous algorithm*, *Collect. Math.*, **53**(2) (2002), 187–210.

OTHER PUBLICATIONS

2. *Broadband control of plate radiation using a piezoelectric, double amplifier active skin and structural acoustic sensing*, (with Chris R. Fuller) *J. Acoust. Soc. Am.*, **107**(2) (2000), 876–884.
1. *A broadband passive-active sound absorption system*, (with Jerome P. Smith and Ricardo A. Burdisso) *J. Acoust. Soc. Am.*, **106**(5) (1999), 2646–2652.

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TEACHING EXPERIENCE

- Summer 2009 *Differential Equations*, Math 355, Saint Louis University, 7 students.
Spring 2009 *Precalculus*, Math 141, Saint Louis University, 18 students.
Scientific Programming, CS 145, Saint Louis University, 15 students.
Fall 2008 *Differential Equations*, Math 355, Saint Louis University, 21 students.
Partial Differential Equations, Math 457, Saint Louis University, 9 students.
Summer 2008 *Differential Equations*, Math 355, Saint Louis University, 12 students.
Spring 2008 *Scientific Programming*, CS 145-02, Saint Louis University, 23 students.
Scientific Programming, CS 145-03, Saint Louis University, 25 students.
Topics in Analysis (Spectral Theory), Math 628, Saint Louis University, $4\frac{1}{2}$ students.
Fall 2007 *Scientific Programming*, CS 145, Saint Louis University, 16 students.
Partial Differential Equations, Math 457, Saint Louis University, 12 students.
Spring 2007 *Scientific Programming*, CS 145, Saint Louis University, 21 students.
Real Analysis II, Math 522, Saint Louis University, 4 students.
Fall 2006 *Differential Equations*, Math 355, Saint Louis University, 10 students.
Real Analysis I, Math 521, Saint Louis University, 6 students.
Spring 2006 *Metric Spaces*, Math 422, Saint Louis University, 10 students.
Special Topics: Signal & Image Processing, Math 493, Saint Louis University, 11 students.
Fall 2005 *Scientific Programming*, CS 145, Saint Louis University, 7 students.
Introduction to Analysis, Math 421, Saint Louis University, 11 students.
Partial Differential Equations, Math 457, Saint Louis University, 10 students.
Spring 2005 *Calculus II*, Math 143, Saint Louis University, 27 students.
Differential Equations, Math 355, Saint Louis University, 26 students.
Fall 2004 *Calculus III*, Math 244, Saint Louis University, 25 students.
Partial Differential Equations, Math 457, Saint Louis University, 10 students.
Spring 2004 *Calculus II*, Math 143, Saint Louis University, 22 students.
Differential Equations, Math 355, Saint Louis University, 26 students.
Fall 2003 *Calculus I*, Math 142, Saint Louis University, 26 students.
Calculus III, Math 244, Saint Louis University, 27 students.
Spring 2003 *Differential Equations*, Math 2403, Georgia Institute of Technology, 66 students.
Fall 2002 *Calculus III*, Math 2401, Georgia Institute of Technology, 25 students.
Spring 2001 *Advanced Calculus II*, U20-406, University College of Washington University, 2 students.
Fall 1999 *Calculus I*, Math 131, Washington University, 24 students.

READING COURSES DIRECTED

- Spring 2009 *Wavelet Theory & Functional Analysis*, Math 598, Saint Louis University, 3 credits.
Fall 2008 *Finite Element Analysis*, Math 498, Saint Louis University, 1 credit.
Shift-Invariant Spaces and Applications, Math 598/698, Saint Louis University, 3 credits.
Spring 2008 *Wavelet Theory: Multiresolution Analysis*, Math 598, Saint Louis University, 3 credits.
Spring 2007 *Introduction to Stochastic Processes*, Math 498, Saint Louis University, 1 credit.
Fall 2006 *Introduction to Harmonic Analysis*, Math 598, Saint Louis University, 3 credits.
Wavelets in Signal Processing, Math 498, Saint Louis University, 1 credit.
Spring 2006 *The Finite Element Method*, Math 498, Saint Louis University, 1 credit.
Spring 2005 *Introduction to Fourier Analysis*, Math 298, Saint Louis University, 2 credits.

THESES ADVISED

- May 2009 Master's Thesis: *Biorthogonal wavelet systems on the torus*, Douglas Runge.

PEDAGOGICAL PRESENTATIONS

5. *What is Chaos?*, April 2008, Mathematics Teacher Circle, Washington University, Saint Louis, Missouri.
4. *The nonholonomy of the rolling sphere*, June 2006, REU Smorgasbord Seminar, Cornell University, Ithaca, New York. (1 hour)
3. *An introduction to wavelets*, November 2001, Math Club Talk, McKendree College, Lebanon, Illinois. (1 hour)
2. *Probability in dungeons and dragons*, November 2001, Math Circles Discussion, Washington University, Saint Louis, Missouri. (Math Circles involves interactive discussions in which middle-school students are exposed to interesting mathematical topics.)
1. *The hat problem*, October 2001, Math Club Talk, Washington University, Saint Louis, Missouri. (1 hour)

RESEARCH PRESENTATIONS

19. *Another look at periodic wavelets*, May 2009, 20 Years of Wavelets, DePaul University, Chicago, Illinois. (25 min.)
18. *Wavelets on the torus*, April 2009, Computational Analysis Seminar, Vanderbilt University, Nashville, Tennessee. (1 hour)
17. *Frame potential and finite abelian groups*, March 2008, Spring Southeastern Sectional Meeting of the AMS, Special Session on Wavelets, Frames, and Multi-Scale Constructions, Louisiana State University, Baton Rouge, Louisiana. (20 min.)
16. *Characterizations of finite-dimensional tight frames*, November 2007, Analysis Seminar, Iowa State University, Ames, Iowa. (1 hour)
15. *Sampling and upsampling operators in finite abelian group algebras*, September 2007, Wavelet Seminar, Washington University, St. Louis, Missouri. (1 hour)
14. *Stable filtering schemes with rational dilations*,
 - May 2007, 31st SIAM Southeastern-Atlantic Section Meeting, The University of Memphis, Memphis, Tennessee. (20 min.)
 - April 2007, 2nd Illinois/Missouri Applied Harmonic Analysis Meeting, Washington University in St. Louis, St. Louis, Missouri. (40 min.)
13. *Frame decompositions of PSI spaces with rational dilations*,
 - January 2007, Workshop on Harmonic and Geometric Analysis and Applications, Louisiana State University, Baton Rouge, Louisiana. (25 min.)
 - October 2006, Wavelet Seminar, Washington University, St. Louis, Missouri. (1 hour)
12. *Projective multiresolution analysis for rational dilations*, May 2006, Analysis Seminar, University of Oregon, Eugene, Oregon. (1 hour)

11. *Orthogonal wavelet frames and vector-valued discrete wavelet transforms*, May 2006, Current Trends in Harmonic Analysis and Its Applications: Wavelets and Frames, University of Colorado at Boulder, Boulder, Colorado. (20 min.)
10. *Basic applications of wavelets*, March 2005, Wavelet Seminar, Washington University, St. Louis, Missouri. (1 hour)
9. *Shift-invariant frames and the frame potential*, June 2004, ShowMe Analysis Seminar 2004, University of Missouri-Columbia, Columbia, Missouri. (25 min.)
8. *Nonseparable bidimensional filter banks associated with oversampled wavelet transforms*, May 2004, Second International Conference on Computational Harmonic Analysis, Vanderbilt University, Nashville, Tennessee. (30 min.)
7. *Convolutional frames and the frame potential*, March 2004, Washington University and University of Zagreb Workshop on Wavelets, Washington University, Saint Louis, Missouri. (1 hour)
6. *Multiresolution operators in wavelet theory*, April 2003, Analysis Seminar, Georgia Institute of Technology, Atlanta, Georgia. (1 hour)
5. *Co-affine systems in \mathbb{R}^d* , March 2003, Spring Southeastern Sectional Meeting of the AMS, Special Session on Frames, Wavelets, and Tomography, Louisiana State University, Baton Rouge, Louisiana. (25 min.)
4. *Oversampling wavelet frames*, January 2003, Wavelets, Frames, and Operator Theory Workshop, University of Maryland at College Park, College Park, Maryland. (30 min.)
3. *Quasi-affine systems based on the à trous algorithm*, December 2001, 18th Auburn Mini-conference on Harmonic Analysis and Related Areas, Auburn University, Auburn, Alabama. (20 min.)
2. *The use of a piezoelectric double amplifier active-skin in the control of panel radiation*, June 1997, Joint Meeting: 133rd Acoustical Society of America Meeting and NOISE-CON '97, Pennsylvania State University, State College, Pennsylvania, J. Acoust. Soc. Am., **101**(5), pp. 3108, May 1997. (15 min.)
1. *Control of structural radiation with an integrated, piezoelectric double amplifier skin*, April 1997, 1997 Office of Naval Research Transducer Materials and Transducers Workshop, Pennsylvania State University, State College, Pennsylvania. (15 min.)