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EDUCATION

Ph.D. Mathematics, University of Notre Dame, Notre Dame, IN. May 2011.

M.S. Mathematics, New York University, New York City, NY. May 2005.

B.S. Mathematics with Specialization in Computer Science, University of Chicago, Chicago, IL. May 2001.

TEACHING EXPERIENCE

Instructor, Department of Mathematics, University of Notre Dame.
- Calculus I for business and social science students, Fall 2009.
- Calculus II for business and social science students, Spring 2009.

Teaching Assistant, Department of Mathematics, University of Notre Dame, Fall 2006–Spring 2008, Spring 2010–Spring 2011. Conducted weekly tutorials for Honors Calculus I and II and Calculus I, II and III for science and engineering students.

Instructor, Thomas Jefferson High School for Science and Technology.
- Artificial Intelligence, Fall 2002–Spring 2003.
- Computer Architecture, Fall 2002–Spring 2003.

RESEARCH PUBLICATIONS

1. C. Holliman, *Non-Uniform Dependence and Well-Posedness for the Periodic Hunter-Saxton Equation*, J. Diff. Int. Eq. **23**, No. 11-12, (2010), 1159-1194.
Abstract: We demonstrate in the periodic case that the data-to-solution map for the Hunter-Saxton (HS) equation is not a uniformly continuous map on bounded subsets of homogeneous Sobolev spaces with exponent greater than 3/2. This result shows that continuous dependence on the initial data of solutions to the this equation is sharp. The proof relies on well-posedness results, approximate solutions and conserved quantities for the HS equation in conjunction with delicate commutator and multiplier estimates.

2. A. Himonas and C. Holliman, *On the Well-Posedness of the Degasperis-Procesi Equation*, Disc. Cont. Dyn. Syst. **31**, No. 2, (2011), 469–488 .
Abstract: We will demonstrate, in both the periodic and the non-periodic cases, that the data-to-solution map for the Degasperis-Procesi (DP) equation is not a uniformly continuous map on bounded subsets of Sobolev spaces with exponent greater than 3/2. This result shows that continuous dependence on the initial data of solutions to the this equation is sharp. The proof relies on well-posedness results, approximate solutions, and conserved quantities for the DP equation.

3. A. Himonas and C. Holliman, *The Cauchy Problem for the Novikov equation*, preprint (submitted).
Abstract: We study the initial value problem for a Camassa-Holm type equation with cubic nonlinearities that has been recently discovered by Vladimir Novikov to be integrable. For $s > 3/2$, using a Galerkin-type approximation method, we show that this equation is well-posed in Sobolev spaces H^s on both the line and the circle with continuous dependence on initial data. Furthermore, we prove that this dependence is optimal by showing that the data-to-solution map is not uniformly continuous. The nonuniform dependence is proved using the method of approximate solutions in conjunction with well-posedness estimates.

4. A. Himonas and C. Holliman, *Norm Inflation and ill-posedness for the Degasperis-Procesi equation*, preprint (submitted).
Abstract: For $s < 3/2$ it is shown that the Cauchy problem for the Degasperis-Procesi equation (DP) is ill-posed in Sobolev spaces H^s. If $1/2 \leq s < 3/2$ then ill-posedness is due to norm inflation. This means that there exist DP solutions such that initially their H^s size is arbitrarily small and after arbitrarily short time it becomes arbitrarily large. Since an equivalent to L^2-norm quantity is conserved by DP solutions, there is no norm inflation in H^0 for these solutions. In this case ill-posedness is caused by the shrinking to zero lifespans. For all other $s < 1/2$ the situation is similar to H^0.

INVITED TALKS

The Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave phenomena: Computation and Theory, University of Georgia in Athens, *Title: TBA*, April 2011.

AMS Sectional Meeting, University of Notre Dame, *On the Well-Posedness of the Degasperis-Procesi Equation*, November 2010.

Notre Dame PDE, Complex Analysis and Differential Geometry Seminar, *Continuity Properties of the Data-to-Solution Map for the Degasperis-Procesi Equation*, October 2010.

The 8th AIMS International Conference, Dresden University of Technology, Germany, *On the Well-Posedness of the Hunter-Saxton Equation*, May 2010.

Notre Dame PDE, Complex Analysis and Differential Geometry Seminar, *Non-uniform Dependence for the Hunter-Saxton Equation*, February 2010.

CONFERENCES ATTENDED

66th Midwest Partial Differential Equations Seminar, University of Illinois at Chicago, November 2010.

AMS 2010 Fall Central Section Meeting, University of Notre Dame, November 2010.

The 8th AIMS International Conference, Dresden University of Technology, Germany, May 2010.

V Workshop on Geometric Analysis of PDE and Several Complex Variables, Serra Negra, Brazil, August 2009.

The 4th Symposium on Analysis and PDEs, Purdue University, May 2009.

FELLOWSHIPS AND HONORS

Outstanding Graduate Student Teacher Award, University of Notre Dame Kaneb Center for Teaching and Learning, awarded April 2010.

VIGRE Mathematics Internshipship, University of Chicago, Summer 2000.

TRAINING IN TEACHING

Teaching Seminar, Department of Mathematics, University of Notre Dame, Spring 2009.

PROFESSIONAL MEMBERSHIPS

American Mathematical Society

Mathematical Association of America