

PUBLICATIONS:

Papers in Refereed Journals:

Wenyuan Wu, Greg Reid and Silvana Ilie, "Implicit Riquier Bases and their Semi-Discretizations", To appear in the Journal of Symbolic Computation. Accepted April 22, 2008.

Greg Reid and Lihong Zhi, "Solving polynomial systems via a symbolic-numeric elimination method", To appear in the Journal of Symbolic Computation. Accepted February 22, 2008.

I.G. Lisle, G.J. Reid, "Symmetry classification using invariant differential operators", Foundations of Computational Mathematics (2006), 353—386.

Marc Moreno Maza, Greg J. Reid, Robin Scott and Wenyuan Wu: "On Approximate Triangular Decompositions in Dimension Zero". Journal of Symbolic Computation. **42**(7), (2007) 693-716.

Silvana Ilie, Robert M. Corless and G. J. Reid, "The numerical solution of index-1 differential algebraic equations is of polynomial cost", Numerical Algorithms 41, (2006) 161-171.

Feng Xie, Greg Reid, S.R. Valluri, "A numerical method for one dimensional action functionals of photonic band gap structures", Canadian Journal of Physics/Rev. Can. Phys. **82**(6) (2004) 423-437.

Andrea Doeschl, Matt Davison, Henning Rasmussen, and Greg Reid, "Assessing Cellular Automata Based Models using Partial Differential Equations", Mathematical and Computer Modelling 40 (2004) 977-994.

A. D. Wittkopf and G. J. Reid, "Fast Differential Elimination in C: The CdiffElim Environment" Computer Physics Communications, **139** (2) (2001) 192-217

G. J. Reid, P. Lin and A. D. Wittkopf, "Differential-Elimination Completion Algorithms for DAE and PDAE", Studies in Applied Mathematics, **106** (1) (2001) 1-45.

E. L. Mansfield, G. J. Reid and P. A. Clarkson, "Nonclassical Reductions of a 3+1-Cubic Nonlinear Schrödinger System", Computer Physics Communications **115** (1998) 460-488.

I. G. Lisle and G. J. Reid, "Geometry and Structure From Infinitesimal Defining Equations", Journal of Symbolic Computation **26** (1998) 355-379.

G. J. Reid, A. D. Wittkopf and A. Boulton, "Reduction of Systems of Nonlinear Partial Differential Equations to Simplified Involutive Forms", Eur. J. of Appl. Math. **7** (1996) 635-666.

G. J. Reid, "Algorithms for Reducing a System of PDEs to Standard Form, Determining the Dimension of its Solution Space and Calculating its Taylor Series Solution", Eur. J. of Appl. Math. **2** (1991) 293-318.

G. J. Reid, "Finding Abstract Lie Symmetry Algebras of Differential Equations Without Integrating Determining Equations", Eur. J. of Appl. Math. **2** (1991) 319-340.

G. J. Reid, "A Triangularization Algorithm Which Determines the Lie Symmetry Algebra of any System of PDEs", J. Phys. A: Math. Gen. **23** (1990) 853-859.

G. W. Bluman and G. J. Reid, "Sequences of Related Linear PDEs", J. of Math. Anal. and its Applns., **144** (1989) 565-585.

G. W. Bluman and G. J. Reid, "New Classes of Symmetries for Ordinary Differential Equations", *IMA J. of Appl. Math.*, **40** (1988) 87-94.

G. W. Bluman, S. Kumei and G. J. Reid, "New Classes of Symmetries for Partial Differential Equations", *J. of Math. Phys.*, **29** (1988) 806-811.

G. J. Reid, "Determination of the Symmetries Characterising Separable Systems in Euclidean Spaces", *J. Phys. A: Math and Gen.*, **21** (1988) 353-362.

E. K. Blum and G. J. Reid, "On the Numerical Solution of Three-Dimensional Boundary Value Problems By-Separation of Variables", *SIAM J. Numerical Anal.*, **25** (1988) 75-90.

G. J. Reid, "R-Separation for Heat and Schrödinger Equations", *SIAM J. Math. Anal.*, **17** (1986) 646-687.

E. G. Kalnins, W. Miller Jr. and G. J. Reid, "Separation of Variables for Complex Riemannian Spaces of Constant Curvature I. Orthogonal Coordinates for S_nC and E_nC ", *Proceedings of the Royal Society*, **394** (1984) 183-206.

E. G. Kalnins and G. J. Reid, "R-Separation for the Hamilton-Jacobi Equation", *Letters in Math. Phys.* **6** (1982) 97-100.

Papers in Refereed Conference Proceedings:

ISSAC = *International Symposium on Symbolic and Algebraic Computation*

IMACS ACA = *Intern. Assoc'n for Math. and Computers in Simulation Applicns. of Computer Algebra*.

Wenyuan Wu and Greg Reid, "Symbolic-numeric Computation of Implicit Riquier Bases for PDE", *Proc. International Symposium on Symbolic and Algebraic Computation (ISSAC 2007)*, pages 377 - 386, ACM Press. 2007.

Marc Moreno Maza, Greg J. Reid, Robin Scott and Wenyuan Wu: On Approximate Linearized Triangular Decompositions. *In Symbolic-Numeric Computation*, edited by Dongming Wang and Lihong Zhi, (Birkhauser, Basel, Boston) 2006, in press.

Wenyuan Wu and Greg Reid, "Application of Numerical Algebraic Geometry and Numerical Linear Algebra to PDE", *Proc. International Symposium on Symbolic and Algebraic Computation (ISSAC 2006)*, Edited by Jean-Guillaume Dumas, pages 345-352, ACM Press. 2006.

R.M. Corless, S. Ilie, G. Reid, "Computational complexity of numerical solution of polynomial systems", *Proceedings of Transgressive Computing 2006*, Granada, Spain (2006) 405-408.

Greg Reid, Jan Verschelde, Allan Wittkopf and Wenyuan Wu, "Symbolic-Numeric Completion of Differential Systems by Homotopy Continuation", *Int'l Symposium on Symbolic and Algebraic Computation, ISSAC 2005*, July 24-27, 2005, Manuel Kauers, ed. ACM Press, 269-276.

M. Moreno Maza, G. Reid, R. Scott, W. Wu, "On approximate triangular decompositions, I. Dimension zero", *Int'l Workshop on Symbolic Numeric Computation SNC 2005*, Xi'an China, July 19-21, 2005, 250-275.

M. Moreno Maza, G. Reid, R. Scott, W. Wu, "On approximate triangular decompositions, II. Linear systems", *Int'l Workshop on Symbolic Numeric Computation SNC 2005*, 276-296.

Wenqin Zhou, David J. Jeffrey, Greg J. Reid, "Symbolic preprocessing for the numerical simulation of multibody dynamic systems", *SNC 2005*, 355-364

G. Reid, Jianliang, Tang, Jianping Yu, Lihong Zhi, “Hybrid method for solving new pose estimation equation system”, H. Li, P.J. Olver, G. Sommer, eds; Computer Algebra and Geometric Algebra with Applications, LNCS 3519 Proceedings IWMM-GIAE 2004, Springer Verlag, (2005) 44-55.

Wenqin Zhou, David J. Jeffrey, Greg J. Reid, “An algebraic method for analyzing open-loop dynamic systems”, A. Inglesias, ed. Computational Science – ICCS 2005, Pt 3, Lecture Notes in Computer Science 3516, Proceedings CASA’2005, Springer, 586-593.

Wenqin Zhou, David J. Jeffrey, Greg J. Reid, Chad Schmitke, John McPhee, “Implicit reduced involutive forms and their application to engineering multibody systems, H. Li, P.J. Olver, G. Sommer, eds. Computer Algebra and Geometric Algebra with Applications, LNCS 3519: Proceedings IWMM-GIAE 2005, Springer (2005) 31-43.

Greg Reid, Lihong Zhi, “Solving nonlinear polynomial system via symbolic-numeric elimination method”, J.C. Faugère and F. Rouillier, eds, Proceedings of the Int’l. Conference on Polynomial System Solving, (2004), 50-53.

J. Bonasia, F. Lemaire, G.J. Reid, R. Scott & L. Zhi, Determination of approximate symmetries of differential equations, Centre de Recherches Mathématiques CRM Proceedings and Lecture Notes **39**, Proceedings of Workshop on Group Theory and Analysis (CRM, Montreal), (2004) 233-250.

Gregory J. Reid, Jianliang. Tang, Jianping Yu and Lihong Zhi, “Hybrid method for solving new pose estimation equation system”, Computer Algebra and Geometric Algebra with Applications, 6th Int’l. Workshop, IWMM 2004, Shanghai, China, May 19-21, 2004 and Int’l Workshop, GIAE 2004, Xian, China, May 24-28, H. Li, P.J. Olver, G. Sommer eds. Springer Verlag Berlin Heidelberg, 2004, pp 44-55.

G. Reid, J. Tang, and L. Zhi “A complete Symbolic-Numeric Linear Method for Camera Pose Determination”, Proceedings 2003 International Symposium on Symbolic and Algebraic Computation (ISSAC), ACM Press, New York, (2003) 215-223.

K. Hazaveh, D.J. Jeffrey, G.J. Reid, S.M. Watt & A.D. Wittkopf (2003), “An Exploration of Homotopy Solving in Maple”, Proc. of the Sixth Asian Symp. on Computer Math. (ASCM 2003). Lect. Notes Series on Computing by World Sci. Publ. 10 edited by Z. Li & W. Sit (Singapore/River Edge, USA) 145-162.

M.W. Giesbrecht, G.J. Reid, Y. Zhang, “Non-commutative Grobner bases in Poincare-Birkhoff-Witt extensions”, Proceedings of the Fifth International Workshop on Computer Algebra in Scientific Computing (CASC 2002, Yalta, Ukraine), edited by V.G. Ganzha, E.W. Mayr and E.V. Vorozhtsov (Pub: Technical University of Munich) (2002) 97-106.

G. J. Reid and A. D. Wittkopf, Determination of Maximal Symmetry Groups of Classes of Differential Equations, Proceedings of the 2000 International Symposium on Symbolic and Algebraic Computation, ACM Press, New York. (2000) 272-280.

C. J. Rust, G. J. Reid and A. D. Wittkopf, “Existence and Uniqueness Theorems for Formal Power Series Solutions of Analytic Differential Systems”, Proceedings of the 1999 International Symposium on Symbolic and Algebraic Computation, ACM Press, New York, (1999) 105-112 .

C. J. Rust and G. J. Reid, “Rankings of Partial Derivatives”, Proceedings of the 1997 International Symposium on Symbolic and Algebraic Computation, ACM Press, New York, (1997) 9-16.

I. G. Lisle, G. J. Reid and A. Boulton, “Algorithmic Determination of the Structure of Infinite Symmetry Groups of Differential Equations”, in Proceedings of the 1995 International Symposium on Symbolic and Algebraic Computation, ACM Press, New York (1995) 1-6.

G. J. Reid, D. T. Weih and A. D. Wittkopf, “A Point Symmetry Group of a Differential Equation Which Cannot Be Found Using Infinitesimal Methods”, in Modern Group Analysis: Advanced Analytical and Computational Methods in Mathematical Physics, N. H. Ibragimov, M. Torrisi and A. Valenti (eds.) (1993) 311-316 (Kluwer Academic Publishers, Amsterdam).

G. J. Reid, I. G. Lisle, A. Boulton and A. D. Wittkopf, “Algorithmic Determination of Commutation Relations for Lie Symmetry Algebras of PDEs”, in Proceedings of the 1992 International Symposium on Symbolic and Algebraic Computation, ACM Press, New York, (1992) 63-68.

G. J. Reid and A. Boulton, “Reduction of Systems of Differential Equations to Standard Form and Their Integration Using Directed Graphs”, in Proceedings of the 1991 International Symposium on Symbolic and Algebraic Computation, ACM Press, Bonn, (1991) 308-312.

G. J. Reid, “Algorithmic Determination of Lie symmetry Algebras of Differential Equations”, in Proceedings of the Annual Seminar of the Canadian Math. Soc. of Lie Theory, Differential Equations and Representation Theory, edited by V. Hussin (Montréal, Université de Montréal) (1989) 363-372.

Other Refereed Contributions:

Wenyuan Wu, Greg Reid and Oleg Golubitsky, “Towards Geometric Completion of Differential Systems by Points”, To appear in the Research Institute for Symbolic Computation (RISC) Series, accepted May 20, 2008..

Robin Scott, Greg Reid, Wenyuan Wu and Lihong Zhi, “Geometric Involutive Bases and their Application to the Computation of Groebner Bases”, To appear in the Research Institute for Symbolic Computation (RISC) Series, accepted May 15, 2008..

G.J. Reid, C. Smith and J. Verschelde, “Geometric Completion of Differential Systems using Numeric-Symbolic Continuation”, SIGSAM Bulletin, **36**, (140), (2002) 1-17.

G. J. Reid and I. G. Lisle, “Geometric and Algebraic Algorithms for Nonlinear Differential Equations.” Tutorial notes, 91 pages ((1997) ACM Press, New York). One of three invited full day tutorials presented at the International Symposium on Symbolic and Algebraic Computation, Maui (Tutorial Proposals were refereed).

G. J. Reid (1984), Ph.D. Thesis, University of Waikato, Hamilton, New Zealand. Chapter 7 of the book Separation of Variables for Riemannian Spaces of Constant Curvature (Pitman, 1986) by E. G. Kalnins is a synopsis of some of the results of my thesis.

Chapters in Books:

I.G. Lisle and G.J. Reid, “Cartan Structure of Infinite Lie Pseudogroups” in P.J. Vassiliou and I.G. Lisl (eds) “Geometric Approaches to Differential Equations”, Cambridge University Press, Cambridge, UK (2000) 116-145.

Supervision of the Development of Software Packages:

G. Reid (2003) Homotopy: a Maple package for solving polynomial systems. Reviewed and accepted by the Maple Company for its commercial use.

J. Drexler (2002) ShockPlot. A Maple package for plotting shock waves for hyperbolic PDE.

A.D. Wittkopf (2001). The CDiffElim Environment; Associated Journal Paper: Wittkopf and Reid (2001). "Fast Differential Elimination in C: The CDiffElim Environment" appeared in CPC. Package is approx. 20,000 lines of code in C. Reviewed, accepted and distributed in the Computer Physics Communications (CPC) Program Library.

I. Kotsireas and G. J. Reid (2001). The PolynomialTools commands PDEToPolynomial and PolynomialToPDE. Distributed as part of Maple 7. Associated Technical Report: I. Kotsireas and G. J. Reid (2001). "Alternative Methods for solving Polynomial Systems", ORCCA Technical Report TR-01-02, available at <http://www.orcca.on.ca/TechReports>. Reviewed and accepted by the Maple company for its commercial use.

A. D. Wittkopf (2001). The RifSimp Package Version 1.1 Distributed as part of Maple 7. Approx. 12,000 lines of code, and over 100 printed single spaced documentation/example pages. Part of core Maple based on the theory developed in papers described elsewhere in this document. Reviewed and accepted by the Maple company for its commercial use.

A. D. Wittkopf (2000). The RifSimp package Version 1.0. Distributed as part of Maple 6 and 6.01. Approx. 9,000 lines of code, and approx. 50 printed single spaced documentation/example pages. Reviewed and accepted by the Maple company for its commercial use.

A. D. Wittkopf and G. J. Reid (1993). The Standard Form Package. Available on the web, for Maple V releases 1-4 at <http://www.cecm.sfu.ca/~wittkopf>

G. J. Reid (1990). A Macsyma Program for Symmetry Calculation (unpublished).

Associated Paper:

G. J. Reid (1990), J. Phys. A: Math. Gen. **23**, 853-859.

G. J. Reid (1984). A Macsyma Program for Separation of Variables calculations for Hamilton-Jacobi and Helmholtz Equations in Riemannian Spaces. Associated Papers: G.J. Reid (1988), J. Phys. A: Math and Gen., **21**, 353-362; G. J. Reid (1986), SIAM J. Math. Anal., **17**, 646-687; and Reid's PhD Thesis.

Submitted Work

F. Lemaire, G.J. Reid, Y. Zhang and C. Rust, Noncommutative Existence and Uniqueness Theory for analytic systems of Nonlinear Partial Differential Equations, being revised for the Journal of Computational Mathematics, London Mathematical Society.

G. J. Reid, I. G. Lisle and A. Boulton, Characterising Lie Systems by their infinitesimal symmetries, ORCCA Technical Report TR-00-13 (University of Western Ontario), submitted. 32 pages