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BIBLIOGRAPHY
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I. BOOKS

1. K. Atkinson, D. Chien, and O. Hansen. *Spectral Methods Using Multivariate Polynomials On The Unit Ball,* Chapman & Hall/CRC Press, 2019.

2. K. Atkinson and Weimin Han. *Spherical Harmonics and Approximations on the Unit Sphere : An Introduction*, Lecture Notes in Mathematics #2044, Springer-Verlag, New York, 2012.

3. K. Atkinson and Weimin Han. *Theoretical Numerical Analysis: A Functional Analysis Framework*, 3rd edition, Springer-Verlag, New York, 2009.

4. K. Atkinson, Weimin Han, and David Stewart. *The Numerical Solution of Ordinary Differential Equations*, John Wiley Pub., 2009.

5. K. Atkinson and Weimin Han. *Theoretical Numerical Analysis: A Functional Analysis Framework*, 2nd edition, Springer-Verlag, New York, 2005.

6. K. Atkinson and Weimin Han. *Elementary Numerical Analysis*, 3rd edition, John Wiley, New York, 2003. [There is a significant MATLAB software component to this edition.] A Chinese language edition was published in 2009.

7. K. Atkinson and Weimin Han. *Theoretical Numerical Analysis: A Functional Analysis Framework*, Springer-Verlag, New York, 2001.

8. *The Numerical Solution of Integral Equations of the Second Kind*, Cambridge University Press, 1997, 552 pages. This is both an update and a significant extension of the book in [16] below.

9. *Elementary Numerical Analysis*, 2nd edition, John Wiley, New York, 1993. A Korean language edition appeared in 1995.

10. David Chien and K. Atkinson. *Solutions Manual* (for the book in [9]), John Wiley & Sons, 1993. These are the complete worked solutions of all problems in the text, together with a discussion of the text material.

11. *An Introduction to Numerical Analysis*, 2nd edition, 1989, 693 pages. This was a very time-consuming rewrite of the earlier 1978 edition, given below in [14].

12. *Elementary Numerical Analysis*, John Wiley & Sons, 1984, 416 pages.

13. *Solutions Manual* (for the book in [12]), John Wiley & Sons, 1985, 238 pages. These are the complete worked solutions of all problems in the text, together with a discussion of the text material.

14. *An Introduction to Numerical Analysis*, John Wiley, New York, l978, 587 pages.

15. *Solutions Manual* (for book in [14]), John Wiley, New York, 1978. This is a general instructors guide of 217 pages, giving much more information than the usual solutions manual, including complete worked solutions to all problems.

16. *A Survey of Numerical Methods for the Solution of Fredholm Integral Equations of the Second Kind*, SIAM, Philadelphia, l976.

II. PAPERS

[In general, all papers given below have been refereed. Those in journals have been peer-refereed in the standard manner. Those in conference proceedings were refereed in various ways, dependent on the conference organizers' way of organizing the review process.]

1. K. Atkinson, David Chien, and O. Hansen. Constructing diffeomorphisms between simply connected plane domains, *Electronic Transactions on Numerical Analysis* **55** (2022), pp. 671-686, DOI=10.1553/etna_vol55s671.

2. K. Atkinson, David Chien, and O. Hansen. Multivariate quadrature of a singular integrand, *Advances in Computational Mathematics* **47** (2021), issue #3, paper #44, DOI=10.1007/s10444-021-09869-4.

3. K. Atkinson, David Chien, and O. Hansen. A spectral method for solving linear elliptic equations with a nonlinear Neumann boundary condition, *Numerical Algorithms* **81** (2019), pp. 313-344, DOI=10.1007/s11075-018-0550-y.

4. K. Atkinson, David Chien, and O. Hansen. A spectral method for the biharmonic equation, in *Contemporary Computational Mathematics - A Celebration of the 80th Birthday of Ian Sloan* (J. Dick, F. Y. Kuo, H. Wózniakowski, eds.), Vol. 1, Springer-Verlag, 2018, pp. 97-118.

5. K. Atkinson, David Chien, and O. Hansen. A spectral method for nonlinear elliptic equations, *Numerical Algorithms* **74** (2017), pp. 797-819. DOI = 10.1007/s11075-016-0172-1.

6. K. Atkinson, David Chien, and O. Hansen. Evaluating polynomials over the unit disk and the unit ball, *Numerical Algorithms* **67** (2014), pp. 691-711, DOI=10.1007/s11075-013-9817-5.

7. K. Atkinson,O. Hansen, and D. Chien. A spectral method for parabolic differential equations, *Numerical Algorithms* **63** (2013), pp. 213-237, DOI=10.1007/s11075-012-9620-8.

8. W. Han, K. Atkinson, and H. Zheng. Some integral identities for spherical harmonics in an arbitrary dimension, *Journal of Mathematical Chemistry* **50** (2012), pp. 1126-1135.

9. K. Atkinson, and O. Hansen. Creating domain mappings, *Electronic Transactions on Numerical Analysis* **39** (2012), pp. 202-230.

10. K. Atkinson,O. Hansen, and D. Chien.A spectral method for elliptic equations: The Neumann problem, *Advances in Computational Mathematics* **34** (2011), pp. 295-317, DOI=10.1007/s10444-010-9154-3.

11. K. Atkinson, and O. Hansen. A spectral method for the eigenvalue problem for elliptic equations, *Electronic Transactions on Numerical Analysis* **37** (2010), pp. 386-412.

12. K. Atkinson, David Chien, and O. Hansen. A spectral method for elliptic equations: The Dirichlet problem, *Advances in Computational Mathematics,* **33** (2010), pp. 169-189, DOI=10.1007/s10444-009-9125-8.

13. O. Hansen, K. Atkinson, and David Chien. On the norm of the hyperinterpolation operator on the unit disk, *IMA J. Numerical Analysis*, **29** (2009), pp.257-283, DOI=10.1093/imanum/drm052.

14. K. Atkinson and L. Shampine. Algorithm 876: Solving Fredholm integral equations of the second kind in MATLAB, *ACM Trans. Math. Software*, **34** (2008), article #21 (20 pages), DOI=10.1145/1377596.1377601. See the accompanying software package at

    http://homepage.math.uiowa.edu/~atkinson/ftp/Fie.package/

    and on the website of *The MathWorks, Inc.*

15. K. Atkinson and David Chien. A study of the fast solution of the occluded radiosity equation, *Electronic Transactions on Numerical Analysis,* **23** (2006), pp. 219-250.

16. K. Atkinson and O. Hansen. Solving the nonlinear Poisson equation on the unit disk, *Journal of Integral Equations & Applications,* **17** (2005), pp. 223-241.

17. K. Atkinson and A. Sommariva. Quadrature over the sphere, *Electronic Transactions on Numerical Analysis*, **20** (2005), pp. 104-118.

18. J. Seol and K. Atkinson. Numerical evaluation of collocation integrals for the radiosity equation, *Applied Numerical Analysis and Computational Mathematics* **2** (2005), pp. 306-325.

19. K. Atkinson and A. Sommariva. On the numerical solution of some semilinear elliptic problems, *Computing*: *Archives for Scientific Computing* **74** (2005), pp. 159-175.

20. K. Atkinson and Weimin Han. On the numerical solution of some semilinear elliptic problems, *Electronic Transactions on Numerical Analysis* **17** (2004), pp. 206-217.

21. Quadrature of singular integrands over surfaces, *Electronic Transactions on Numerical Analysis* **17** (2004), pp.133-150.

22. Hongling Wang, Joseph Kearney, Kendall Atkinson, Arc-length parameterized spline curves for real-time simulation, *Proceedings of the 5th International Conference on Curves and Surfaces*, Saint-Malo, France, June 2002, pp. 387-396.

23. Hongling Wang, Joseph Kearney, Kendall Atkinson, Robust and efficient computation of the closest point on a spline curve, *Proceedings of the 5th International Conference on Curves and Surfaces*, Saint-Malo, France, June 2002, pp. 397-406.

24. K. Atkinson, David Chien, and Jaehoon Seol. Numerical analysis of the radiosity equation using the collocation method, *Electronic Transactions on Numerical Analysis* **11** (2000), pp. 94-120.

25. K. Atkinson and David Chien. A fast matrix-vector multiplication method for solving the radiosity equation, *Advances in Computational Mathematics,* **12** (2000), pp. 151-174.

26. The planar radiosity equation and its numerical solution, *IMA J. Numerical Analysis* **20** (2000), pp. 303-332.

27. K. Atkinson and Young-mok Jeon. Algorithm 788: Automatic boundary integral equation programs for the planar Laplace equation, *ACM Trans. on Math. Software* **24** (1998), pp. 395-417.

28. K. Atkinson and Graeme Chandler. The collocation method for solving the radiosity equation for unoccluded surfaces, *Journal of Integral Eqns & Applics* **10** (1998), pp. 253-290.

29. The numerical solution of boundary integral equations, in *The State of the Art in Numerical Analysis*, ed. by I. Duff and G. Watson, Clarendon Press, Oxford, 1997, pp. 223-259.

30. Ian Sloan and K. Atkinson. Semi-discrete Galerkin approximations for the single-layer equation on Lipschitz curves, *Journal of Integral Eqns & Applics* **9** (1997), pp. 279-292.

31. David Chien and K. Atkinson. A discrete Galerkin method for a hypersingular boundary integral equation, *IMA J. of Numerical Analysis* **17** (1997), pp. 463-478.

32. Yajun Yang and K. Atkinson. Numerical integration for multivariable functions with point singularities, *SIAM J. Numerical Analysis* **32** (1995), pp. 969-983.

33. K. Atkinson and David Chien. Piecewise polynomial collocation for boundary integral equations, *SIAM J. Scientific Computing* **16** (1995), pp. 651-681.

34. The numerical solution of a nonlinear boundary integral equation on smooth surfaces, *IMA J. Numerical Analysis* ***14*** (1994), pp. 461-483.

35. Two-grid iteration methods for linear integral equations of the second kind on piecewise smooth surfaces in $\mathbb{R}^3$, *SIAM J. Scientific Computing* ***15*** (1994), pp. 1083-1104.

36. K. Atkinson and Ezio Venturino, Numerical evaluation of line integrals, *SIAM J. Numerical Analysis* **30** (1993), pp. 882-888.

37. K. Atkinson and Jose Flores. The discrete collocation method for nonlinear integral equations, *IMA J. of Numerical Analysis* **13** (1993), pp. 195-213.

38. Ivan Graham and K. Atkinson. On the Sloan iteration applied to integral equations of the first kind, *IMA J. of Numerical Analysis* **13** (1993), pp. 29-41.

39. K. Atkinson and Ivan Graham. Iterative variants of the Nyström method for second kind boundary integral equations, *SIAM J. Scientific and Statistical Computing* **13** (1992), 694-722.

40. A survey of numerical methods for solving nonlinear integral equations, *Journal of Integral Eqns and Applics.* **4** (1992), 15-46.

41. K. Atkinson and Ian Sloan. The numerical solution of first kind logarithmic-kernel integral equations on smooth open arcs, *Math. of Computation* **56** (1991), 119-139.

42. A survey of boundary integral equation methods for the numerical solution of Laplace's equation in three dimensions, in *Numerical Solution of Integral Equations*, ed. by M. Golberg, Plenum Pub., New York, 1990, 1-34.

43. K. Atkinson and Graeme Chandler. BIE methods for solving Laplace's equation with nonlinear boundary conditions: The smooth boundary case, *Math. of Computation* **55** (1990), 455-472.

44. A discrete Galerkin method for first kind integral equations with a logarithmic kernel, *Journal of Integral Eqns & Applic.* **1** (1988), 343-363.

45. K. Atkinson and Florian Potra. On the discrete Galerkin method for Fredholm integral equations of the second kind, *IMA Journal of Numerical Analysis* **9** (1989), 385-403.

46. K. Atkinson and Florian Potra. The discrete Galerkin method for nonlinear integral equations, *J. Int. Eqns & Applic.* **1** (1988), 17-54.

47. K. Atkinson and Ivan Graham. An iterative variant of the Nyström method for boundary integral equations on non-smooth boundaries, in *The Mathematics of Finite Elements and Applications*, John Whiteman (ed.), Academic Press, London, 1988, 297-304.

48. K. Atkinson and Florian Potra. Projection and iterated projection methods for nonlinear integral equations, *SIAM J. Num. Anal.* **24** (1987), 1352-1373.

49. K. Atkinson and Alex Bogomolny. The discrete Galerkin method for integral equations, *Math. of Comp.* **48** (1987), 595-616 and S11-S15.

50. Solving integral equations on surfaces in space, in *Constructive Methods for the Practical Treatment of Integral Equations*, ed. by G. Hämmerlin and K. Hoffman, Birkhäuser, Basel, 1985, 20-43.

51. Algorithm 629: An integral equation program for Laplace's equation in three dimensions, *ACM Trans. on Math. Soft.* **11** (1985), 85-96. (This also contains 2400+ lines of code.)

52. The numerical evaluation of particular solutions for Poisson's equation, *IMA Jour. Numerical Analysis*, **5** (1985), 319-338.

53. Piecewise polynomial collocation for integral equations on surfaces in three dimensions, *J. Integral Equations* **9** (1985, supplementary issue), 25-48.

54. N. Mani, K. Atkinson, Ed Haug. Application of singular value decomposition for analysis of mechanical system dynamics, *Trans. ASME: J. Mechanisms, Transmissions, and Automation Design, Amer. Soc. Mech. Eng.* (1984), New York, 1-6.

55. K. Atkinson and Frank deHoog. The numerical solution of Laplace's equation on a wedge, *JIMA: Numerical Analysis* **4** (1984), 19-41.

56. K. Atkinson, Ivan Graham, and Ian Sloan. Piecewise continuous collocation for integral equations, *SIAM J. Num. Anal.* **20** (1983), 172-186.

57. K. Atkinson and Frank deHoog. Collocation methods for a boundary integral equation on a wedge, in *Treatment of Integral Equations by Numerical Methods*, C.T.H. Baker and G. Miller (eds.), Academic Press, 1982, 253-260.

58. Numerical integration on the sphere, *J. Australian Math. Soc.* (Series B)**23** (1982), 332-347.

59. The numerical solution of Laplace's equation in three dimensions-II, in *Numerical Treatment of Integral Equations*, ed. by J. Albrecht and L. Collatz, Birkhäuser, Basel, 1980, 1-23.

60. The numerical solution of Laplace's equation in three dimensions, *SIAM J. Num. Anal.* **19** (1982), 263-274.

61. The numerical solution of a bifurcation problem, *SIAM J. Num. Anal.* **14** (1977), 584-599.

62. An automatic program for Fredholm linear integral equations of the second kind, *ACM Trans. Math. Soft.* **2** (1976), 154-171.

63. Algorithm 503: An automatic program for Fredholm integral equations of the second kind, *ACM Trans. Math. Soft.* **2** (1976), 196-199. (This gives just the preliminary comments. The entire 30 pages of program listings is given in the *Collected Algorithms of the ACM.*)

64. Convergence rates for approximate eigenvalues of compact integral operators, *SIAM J. Num. Anal.* **12** (l975), 213-222.

65. An existence theorem for Abel integral equations, *SIAM J. Math. Anal.* **5** (1974), 729-736.

66. The numerical solution of an Abel integral equation by a product trapezoidal method, *SIAM J. Num. Anal.* **11** (1974), 97-101. (There is an additional technical report of about 40 pages giving additional details of the method.)

67. Iterative variants of the Nyström method for the numerical solution of integral equations, *Numer. Math.* **22** (1973), 17-31.

68. The numerical evaluation of fixed points for completely continuous operators, *SIAM J. Num. Anal.* **10** (1973), 799-807.

69. The numerical solution of Fredholm integral equations of the second kind with singular kernels, *Numer. Math.* **19** (1972), 248-259.

70. The numerical evaluation of the Cauchy transform on simple closed curves, *SIAM J. Num. Anal.* **9** (1972), 284-299.

71. An appendix to the paper by R.P. Gilbert "Integral operator methods for approximating solutions of Dirichlet problems", in *Numerische Methoden der Approximationstheorie*, ISNM Vol. 15, 1970, Birkhäuser Verlag, Stuttgart, pp. 141-146.

72. The numerical solution of integral equations on the half-line, *SIAM J. Num. Anal.* **6** (1969), 375-397.

73. K. Atkinson and A. Sharma. A partial characterization of poised Hermite-Birkhoff interpolation problems, *SIAM J. Num. Anal.* **6** (1969), 230-235. [This paper gives me an Erdös number of 2.]

74. On the order of convergence of natural cubic spline interpolation, *SIAM J. Num. Anal.* **5** (l968), 89-101.

75. The numerical solution of the eigenvalue problem for compact integral operators, *Trans. Amer. Math. Soc.* **129** (1967), 458-465.

76. The numerical solution of Fredholm integral equations of the second kind, *SIAM J. Num. Anal.* **4** (1967), 337-348.

77. The solution of non-unique linear integral equations, *Numer. Math.* **10** (1967), 117-124.

III. NON-RESEARCH ARTICLES

1. Analyse numérique des équations intégrales, in *Techniques de l'Ingénieur*. (Numerical analysis of integral equations, in *Engineer's Technical Editions*.)

2. Numerical Analysis of Fredholm Integral Equations, in *Encyclopedia of Applied and Computational Mathematics*, Springer-Verlag, 2015, pp. 1047-1052.

3. A Personal Perspective on the History of the Numerical Analysis of Fredholm Integral Equations of the Second Kind, in *The Birth of Numerical Analysis*,edited by A. Bultheel and R. Cools, World Scientific Pub., 2009, pp. 53-72:

   http://homepage.math.uiowa.edu/~atkinson/ftp/IE_history.pdf

   For a group picture from the associated conference, see

   http://homepage.divms.uiowa.edu/~atkinson/talks/BirthNA_group.pdf

4. Numerical Analysis, in *Scholarpedia*,

   http://www.scholarpedia.org/article/Numerical_Analysis

5. Numerical Analysis, in *Encyclopedia Britannica Online* (2005), (manuscript 8 pages in length).

6. Recommended resources in numerical analysis, in *Using the Mathematics Literature*, edited by Kristine Fowler, Marcel Dekker, Inc, 2004, pp. 273-299.

7. Numerical Analysis, in *Encyclopedia of Statistical Sciences*, Volume 6, ed. by S. Kotz and N. Johnson, John Wiley & Sons, New York, 1985, 384-388.

IV. TECHNICAL REPORTS

1. K. Atkinson, 'Modelling a road using spline interpolation', *Reports on Computational Maths* #145, Dept of Math, Univ of Iowa. This is a background paper for two conference papers written with Joe Kearney and Hongling Wang of the Computer Science Dept., given above in #22 and #23 under **PAPERS**. For an easy-to-use MATLAB package, go to http://www.math.uiowa.edu/~atkinson/ftp/roads-files/.

2. *User's Guide for a Boundary Element Program.* This accompanies a large boundary element code (written in *Fortran*) which implements many of my ideas from research of the past 35 years on the numerical solution of boundary integral equations in three dimensions. The code and guide is available from the Math Dept anonymous ftp web site or from the author's personal web site, at.

   http://homepage.math.uiowa.edu/~atkinson/laplace.html

   The first version was released in 1993, and a significant extension was released in early 1998, including a new *User's Guide*. The programs and guide, including Version #2, are available at the above URL. The revised user's guide is also available as *Reports on Computational Mathematics* #103 (1998).

3. Yan Chen and K. Atkinson, Solving a single layer integral equation on surfaces in $\mathbb{R}^3$, *Reports on Computational Maths* #51, Dept of Math, Univ of Iowa. Some of the material in this report has been presented in the book #8 given above.

4. An empirical study of the numerical solution of integral equations on surfaces in $\mathbb{R}^3$, *Reports on Computational Mathematics* #1 (1989), Dept of Mathematics, Univ. of Iowa, 49 pages.

5. SPHERE.TRI.PACK: A Spherical Triangulation Package. This Fortran package provides for the creation, refinement, and manipulation of triangulations on the unit sphere, with the triangulations based on inscribed regular polyhedra with triangular faces.

V. IN PREPARATION

1. Numerical approximation of particular solutions to the Poisson equation in two and three dimensions. See paper #52 above.

2. I am preparing a boundary integral equation package, in MATLAB, for solving planar problems for Laplace's equation. As preliminary work, see

   http://homepage.math.uiowa.edu/~atkinson/laplace.html

   and the links given there.

3. Calculating a conformal mapping using Symm's integral equation. This is to include the mapping from the unit disk $\mathbb{B}^2$ onto a simply-connected region Ω, along with its first derivatives. The paper **#??** is another approach to this problem.