KLAUS-JÜRGEN BATHE, in 2021

Klaus-Jürgen Bathe is Professor of Mechanical Engineering at the Massachusetts Institute of Technology, Cambridge, MA 02139.   Telephone # at M.I.T. 617 253-6645

Some personal data

born 1943 in Berlin, Germany,
citizen of Germany, U.S. immigrant

Education

German Abitur (High School Diploma), Oldenburg i.O., Federal Republic of Germany.
B.Sc., Civil Engineering, University of Cape Town, S.A., 1967.
M.Sc., Civil Engineering, University of Calgary, Canada, 1969.
Ph.D., Civil Engineering, University of California, Berkeley, U.S.A., 1971.

Academic appointments

Assistant Research Engineer, University of California, Berkeley, 1972 - 1975.
Assistant, Associate, full Professor of Mechanical Engineering, M.I.T., 1975 -
Associate Head & Head, Division of Mechanics and Materials, Mechanical Engineering Department, M.I.T., 1985 -1991.

Research

K.J. Bathe's research focuses on the development of finite element methods and Machine Learning, for the analysis of structures and solids, heat transfer, fluids and multiphysics problems.

K.J. Bathe has been the principal developer of the SAP IV and NONSAP finite element computer programs (published in 1974), started the development of ADINA and was pursuing and leading from 1974 to 2022 the development of the ADINA System for finite element displacement/stress, heat transfer, fluid flow and fluid-structure interaction analyses.

Web page at M.I.T.

http://meche.mit.edu/people/faculty/kjb@mit.edu

On Google Wikipedia; on Google Scholar

KJ Bathe

Founder of ADINA R & D, Inc.

The company developing the ADINA System for general finite element analyses

www.adina.com

The company was sold to Bentley Systems, Inc. in April 2022.

Founder of the Leadership Program at the University of Cape Town, South Africa

http://www.kjbatheleadership.uct.ac.za/

Mission statement —

The primary goal is to produce graduates with outstanding leadership qualities and a strong sense of social justice, who will go on to play leading and significant roles in business, government, industry and civil society in South Africa and on the African continent

Awards

1967   Gold medalist, Best Final Year Civil Engineering Student, University of Cape Town, South Africa

1981   American Society of Civil Engineers, Walter L. Huber Research Prize for "Contributions in Nonlinear Computational Mechanics"

1981   Doctor of Science, D.Sc., University of Cape Town, South Africa

1985   Gustus L. Larson American Society of Mechanical Engineers and Pi Tau Sigma award for outstanding achievements in Mechanical Engineering

1986   Graduate Student Council Teaching Award, M.I.T.

1995   U.S. National Academy of Engineering award for outstanding contributions to engineering education and research

1999   M.I.T. School of Engineering Award for Distinguished Teaching

2003   Dr.-Ing. E.h. (h.c.), Technical University of Darmstadt, Germany

2003   Dr. h.c., Slovak Academy of Sciences, and Technical University of Zilina, Slovakia

2003   Dr. h.c., Technical University of Rzeszow, Poland

2003   Elected foreign member of Argentine National Academy of Physics, Natural and Exact Sciences

2005   Dr. h.c., Technical University of Madrid (Universidad Politecnica de Madrid), Spain

2005   Den Hartog Distinguished Educator Award, M.I.T.

2006   Dr. h.c., University of Bucharest, Romania

2010   Dr. h.c., University of Miskolc, Hungary

2010   Dr. h.c., University of Buenos Aires, Argentina

2013   D.Sc. h.c., University of Cape Town, South Africa

2015   Dr. h.c., Sorbonne Universités - Université de Technologie de Compiègne, France

Memberships in Major Societies

ASCE, ASME, SIAM

Series Editor -- Book Series

Editor of Book Series "Computational Methods in Engineering & the Sciences", Springer Verlag

Editor-in-Chief

Machine Learning for Computational Science and Engineering, Springer-Nature

Journal Activities

International Journal for Computer Methods in Applied Mechanics and Engineering	On editorial advisory board
International Journal for Numerical Methods in Engineering	On editorial advisory board
Finite Elements in Analysis and Design	On editorial advisory board
Engineering with Computers	On editorial advisory board
Mechanics Research Communications	On editorial advisory board

Advances in Engineering Software	On editorial advisory board
Computational Mechanics	On editorial advisory board
Vietnam Journal of Mechanics	Honorary Editor
Intern. Journal of Computational Methods	Honorary Editor
Engineering Computations	Honorary Editor
Computers & Structures	Honorary Editor

Other Professional Activities

From 1970s to 1990s, consultant to many companies in the U.S., Japan and Europe

Plenary lecturer at many conferences, lecturer at numerous seminars

In Sept. 1986, Founder of ADINA R & D, Inc.

34 video-lectures entitled "Finite Element Procedures for Solids and Structures" with Study Guides, Massachusetts Institute of Technology, 1980s.

Organized the twelve bi-yearly conferences "Nonlinear Finite Element Analysis and ADINA", all held at M.I.T., 1977 to 1999.

Organized the M.I.T. Conference Series on Computational Fluid and Solid Mechanics, held bi-yearly at M.I.T; 2001 - 2013

Member of the Science Council of Germany (Wissenschaftsrat) for the Excellence Initiative in Germany; 2006 - 2013

Books

K. J. Bathe and E. L. Wilson, *Numerical Methods in Finite Element Analysis*, Prentice-Hall, 1976, Translated into Japanese (1980) , Russian (1982).

K. J. Bathe, *Finite Element Procedures in Engineering Analysis*, Prentice-Hall, 1982.

K. J. Bathe, *Finite Element Procedures*, Prentice Hall, 1996, also published by Springer (in German) 2002; 2nd edition KJ Bathe, Watertown, MA, 2014, Amazon.com; and (in Chinese) Higher Education Press China 2016.

M. Kojic and K. J. Bathe, *Inelastic Analysis of Solids and Structures*, Springer, 2005.

D. Chapelle and K. J. Bathe, *The Finite Element Analysis of Shells – Fundamentals*, Springer, 2003, 2nd edition 2011.

M. L. Bucalem and K. J. Bathe, *The Mechanics of Solids and Structures -- Hierarchical Modeling and the Finite Element Solution*, Springer, 2011.

K. J. Bathe, *To Enrich Life*, 2nd edition 2019. Amazon.com.

K.J. Bathe, *How Lawyers Think, Work & When Perhaps not Hire a Lawyer",* 2021. Amazon.com.

Books – editor

K. J. Bathe, J. T. Oden, and W. Wunderlich (eds.), *Formulations and Computational Algorithms in Finite Element Analysis*, M.I.T. Press, 1977.

W. Wunderlich, E. Stein and K. J. Bathe (eds.), *Nonlinear Finite Element Methods in Structural Mechanics*, Springer-Verlag, 1981.

P. Bergan, K. J. Bathe and W. Wunderlich (eds.), *Finite Element Methods for Nonlinear Problems*, Springer-Verlag, 1986.

K. J. Bathe and D. R. J. Owen (eds.), *Reliability of Methods for Engineering Analysis*, Pineridge Press, 1986.

K. J. Bathe (ed.), *Nonlinear Finite Element Analysis and ADINA*, Proceedings of 3rd to 12th Conferences, Pergamon Press, J. Computers & Structures, Vol. 13, No. 5-6, 1981; Vol. 17, No. 5-6, 1983; Vol. 21, No. 1-2, 1985; Vol. 26, No. 1-2, 1987; Vol. 32, No. 3-4, 1989; Vol. 40, No. 2, 1991; Vol. 47, No. 4-5, 1993; Vol. 56, No. 2-3, 1995; Vol. 64, No. 5-6, 1997, and Vol. 72, 1999.

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics*, Elsevier, 2001.

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2003*, Elsevier, 2003.

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2005*, Elsevier, 2005.

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2007*, Elsevier, 2007 (also Special Issue of Computers & Structures, June 2007)

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2009*, Elsevier, 2009 (also Special Issue of Computers & Structures, June 2009)

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2011*, Elsevier, 2011 (also Special Issue of Computers & Structures, June 2011)

K. J. Bathe, (ed.), *Computational Fluid and Solid Mechanics 2013*, Elsevier, 2013 (also Special Issue of Computers & Structures, June 2013)

T. Rabczuk and KJ Bathe (eds), *Machine Learning in Modeling and Simulation*, Springer 2023

ISI Highly Cited Researcher

Original member; ISI highly cited researchers database

On Google Scholar

Over 75,000 citations

Additional Publications of K. J. Bathe

K. J. Bathe, "The Use of the Electronic Computer in Structural Analysis", IMPACT, Journal of UCT Engineering Society, 57-61, 1967.

A. Ghali, J. M. Strong, and K. J. Bathe, "Field Measurement of End Support Reactions of Continuous Multi-Girder Skew Bridge", Proceedings of the Second International Symposium on Concrete Bridge Design, 260-271, April 1969.

K. J. Bathe, "Numerical Analysis of Skew Bridges", Department of Civil Engineering, The University of Calgary, Calgary, Alberta, Canada, April 1969 (M.Sc. thesis).

A. Ghali and K. J. Bathe, "Analysis of Plates Subjected to In-Plane Forces Using Large Finite Elements", International Association for Bridge and Structural Engineering, 30-I, 69-72, 1970.

A. Ghali and K. J. Bathe, "Analysis of Plates in Bending Using Large Finite Elements", International Association for Bridge and Structural Engineering, 30-II, 29-40, 1970.

K. J. Bathe, "Solution Methods for Large Generalized Eigenvalue Problems in Structural

Engineering", Report UCSESM 71-20, Department of Civil Engineering, University of California, Berkeley, November 1971 (Ph.D. thesis).

R. W. Clough and K. J. Bathe, "Finite Element Analysis of Dynamic Response", in <u>Advances in Computational Methods in Structural Mechanics and Design</u>, University of Alabama Press, Huntsville, Alabama, 1972.

F. E. Peterson and K. J. Bathe, "Nonlinear Dynamic Analysis of Reactor Core Components", Engineering Analysis Corp., Report No. S-104.4, Berkeley, California, 1972.

K. J. Bathe and E. L. Wilson, "Linear and Nonlinear Earthquake Analysis of Complex Structures", Proceedings of the Fifth World Conference on Earthquake Engineering, June 1973.

K. J. Bathe and E. L. Wilson, "Eigensolution of Large Structural Systems with Small Bandwith", ASCE, J. Eng. Mech. Div., <u>99</u>, 467-479, June 1973.

K. J. Bathe and E. L. Wilson, "NONSAP - A General Finite Element Program for Nonlinear Dynamic Analysis of Complex Structures", Paper No. M3-1, Proceedings of the Second Conference on Structural Mechanics in Reactor Technology, September 1973.

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E. L. Wilson, I. Farhoomand, and K. J. Bathe, "Nonlinear Dynamic Analysis of Complex Structures", International Journal of Earthquake Engineering and Structural Dynamics, <u>1</u>, 241-252, 1973.

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M. D. Snyder and K. J. Bathe, "Formulations and Numerical Solution of Thermo-Elastic-Plastic and Creep Problems", Acoustics and Vibration Laboratory, Report No. 82448-3, Department of Mechanical Engineering, M.I.T., 1977.

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K. J. Bathe, S. Bolourchi, S. Ramaswamy, and M. D. Snyder, "Some Computational Capabilities for Nonlinear Finite Element Analysis", J. Nuclear Engineering and Design, <u>46</u>, 429-455, 1978.

K. J. Bathe and W. Hahn, "On Transient Analysis of Fluid-Structure Systems", J. Computers & Structures, <u>10</u>, 383-391, 1978.

J. T. Oden and K. J. Bathe, "A Commentary on Computational Mechanics", Applied Mech. Reviews, September 1978.

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J. L. Batoz, K. J. Bathe, and L. W. Ho, "A Search for the Optimal Three-Noded Triangular Plate Bending Element", Acoustics and Vibration Laboratory, Report 82448-8, Department of Mechanical Engineering, M.I.T., November 1978.

K. J. Bathe and A. P. Cimento, "On the Time Integration of Nonlinear Dynamic Response", Proceedings of the Conference of the Groupe Pour L'Avancement Des Methodes Numeriques de l'Ingenieur, Paris, November 1978.

K. J. Bathe (ed.), "Nonlinear Finite Element Analysis and ADINA", Acoustics and Vibration Laboratory, Report 82448-9, Department of Mechanical Eng., M.I.T., August 1979.

K.J. Bathe and M. Khoshgoftaar, "Finite Element Free Surface Seepage Analysis Without Mesh Iteration", J. of Num. and Anal. Methods in Geomechanics, 3, 13-22, 1979.

M. P. Cleary and K. J. Bathe, "On Tractable Constitutive Relations and Numerical Procedures for Structural Analysis in Masses of Geological Materials", Proceedings of the Third International Conference on Numerical Methods in Geomechanics, Aachen, Germany, April, 1979.

K. J. Bathe, "A Brief View on the Current Status of Finite Element Techniques", Proceedings of the Topical Meeting on Computational Methods in Nuclear Engineering, Williamsburg, Virginia, April 1979.

K. J. Bathe, M. D. Snyder, and A. P. Cimento, "On Finite Element Analysis of Elastic-Plastic Response", Proceedings of the Conference on Engineering Applications of the Finite Element Method, Det Norske Veritas, Oslo, Norway, May 1979.

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R. O. Ritchie and K. J. Bathe, "On the Calibration of the Electrical Potential Technique for Monitoring Crack Growth Using Finite Element Methods", J. of Fracture, 15, 47-55, 1979.

S. Key, R. Krieg, and K. J. Bathe, "On Finite Element Analysis of Metal Forming Processes", J. Comp. Meth. In Applied Mech. and Eng., 17/18, 597-608, 1979.

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K. J. Bathe and M. Khoshgoftaar, "On Finite Element Analysis of Nonlinear Heat Transfer with Phase Changes", Proceedings of the 3rd Int. Conference on Finite Elements in Water Resources, The University of Mississippi, Oxford Campus, May 1980.

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K. J. Bathe and C. Almeida, "A Simple and Effective Pipe Elbow Element—Linear Analysis", ASME, J. Applied Mech., 47, 93-100, 1980.

K. J. Bathe and A. P. Cimento, "Some Practical Procedures for the Solution of Nonlinear Finite Element Equations", J. Computer Meth. In Applied Mech. and Eng., 22, 59-85, 1980.

K. J. Bathe, "On the Current State of Finite Element Methods and our ADINA Endeavors", J. Adv. Eng. Software, 2, 59-65, 1980.

K. J. Bathe and V. Sonnad, "On Effective Implicit Time Integration in Analysis of Fluid - Structure Problems", International Journal for Numerical Methods in Engineering, 15, 943-948, 1980.

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T. Ishizaki and K. J. Bathe, "On Finite Element Large Displacement and Elastic-Plastic Dynamic Analysis of Shell Structures", J. Computers & Structures, 12, 309-318, 1980.

M.D. Snyder and K. J. Bathe, "Finite Element Analysis of Thermo-Elastic-Plastic and Creep Response", Acoustics and Vibration Laboratory, Report 82448-10, Department of Mechanical Eng., M.I.T., December 1980.

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K. J. Bathe, "Observations on the Current State of Finite Element Analysis", in NASA Langley

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