VITAE

Name: V. Dakshina Murty

Academic Data:

Indian Institute of Technology
Kanpur, India
July 1969 – June 1974; B. Tech., Mechanical Engineering

University of Oklahoma, Norman
August 1974 – May 1977; M.S. – Nuclear Engineering

University of Oklahoma, Norman
August 1974 – August 1977; M.S., Mechanical Engineering

University of Texas, Austin
August 1977 – January 1982; Ph.D., Engineering Mechanics

Theses Titles:

"Net Energy Analysis of Uranium Fuel Cycle" – M.S., Nuclear Engineering, May 1977, University of Oklahoma. (Dr. J. B. Freim)

"Numerical Solution of Integral Equations Using the Finite Element Method" – M.S. Mechanical Engineering, August 1977, University of Oklahoma. (Dr. J. N. Reddy)

"Finite Element Analysis of Steady, Incompressible Non-Newtonian Fluid Flow and Heat Transfer" – Ph.D. Engineering Mechanics, January 1982, University of Texas. (Dr. E.B. Becker)

Consulting and Research Experience:

1. "Stress Analysis of Wheel Door Actuating Support of T-39 Rockwell Sabreliner", May 1978, University of Texas: Used TEXGAP-2D to analyze stresses in the above part.

2. "Stress Analysis of Compensated Pulsed Alternator, Center of Electromagnetics", Summer 1978, University of Texas: Used TEXGAP-2D to compute stresses in the pulsed alternator subjected to inertial forces.

3. "Stress Analysis of the F Coil of Riggatron Reactor", project supported through Innesco, Inc., Arlington Virginia, Fall 1980, University of Texas: Used TEXGAP-3D to analyze stresses in the coil.

4. "Finite Element Analysis of Transient Heat Conduction Through a Human Body", Spring 1981, University of Texas: Used finite element analysis to perform transient heat transfer calculations through a human body; compared several finite difference schemes for the time dependent part.

5. "Finite Element Analysis of Non-Newtonian Fluid Flow and Heat Transfer", Ph.D. dissertation, University of Texas: Developed a general purpose finite element program with post processor to analyze power-law non-Newtonian and viscoelastic fluids with heat transfer.

6. "Software Development for Turbine Performance Curves", Consultant to the U.S. Army Corps of Engineers, Summer 1982, Portland, Oregon: Developed a program on the desktop HP9845 computer to digitize the turbine performance curves and interpolate to obtain their characteristics.

7. "Stress Analysis of the Kaplan Turbine on the John Day Dam", U.S. Army Corps of Engineers, May 1984 – June 1985, Portland, Oregon: Used ANSYS extensively to perform stress analysis of the Kaplan turbine runner to solve the "stick-slip" problem of the bronze bushings.

8. "Software Development for Fatigue Analysis", Summer 1985, Freightliner Corp., Portland, Oregon: Developed a software package on HP9826 desktop computer for fatigue analysis; the program takes load histories, counts cycles using rainflow algorithm, performs notch sensitivity analysis using linear interpolation or Neuber's rule and finally plots damage vs. amplitude.

9. Consultant to the U.S. Army Corps of Engineers from November 1999 – present. Worked on various problems including turbine testing, performance optimization, piping network analysis, etc.

Presentations and Publications:

1. Net Energy Analysis of Uranium Fuel Cycle, with Freim, J.G., and Gilliland, M., Proceedings of Summer Annual Meeting of American Nuclear Society, June 13-17, 1976, Toronto, Canada.

2. Solution of Linear Integral Equations Using Finite Element Method, with Reddy, J.N., Proceedings of the 13th Midwestern Mechanics Conference, March 24-26, 1977, Chicago, Illinois.

3. Finite Element Solution of Integral Equations Arising in Radiation Heat Transfer and Laminar Boundary Layer Theory, with Reddy, Jn.N., Numerical Heat Transfer, Vol. 1, 1978, pp. 389-401.

4. Solutions of Integral Equations Using Finite Element Method, Proceedings of the 8th Southwestern Graduate Student Conference in Applied Mechanics, April 11-12, 1977, University of Texas, Austin.

5. Solution of Integral Equations Arising in Radiative Heat Transfer and Laminar Boundary Layer Theory Using Finite Elements, Proceedings of the 9th Southwestern Graduate Conference in Applied Mechanics, March 20-21, 1981, University of Houston, Houston.

6. Finite Element Analysis of Non-Newtonian Fluid Flow and Heat Transfer, Proceedings of 12th Southwestern Graduate Conference in Applied Mechanics, April 10-12, 1981, Texas A&M University.

7. The Solution of Free Convection Problems in Closed Regions Using a Penalty Finite Element Method, Proceedings of the Third International Conference on Numerical Methods in Thermal Problems, August 2-5, 1983, University of Washington, Seattle, pp. 519-528.

8. Solution of Entry Length and Recirculating Flow problems of Non-Newtonian Fluids Using Finite Elements, Ibid, pp. 1050-1059.

9. On the Application of the Finite Element Method to the Die-Swell and Fiber Spinning Problems Involving Non-Newtonian Fluids, Proceedings of the Third International Conference on Numerical Methods in Laminar and Turbulent Flow, August 8-11, 1983, University of Washington, Seattle, pp. 691-701.

10. Curvature Effects of Fluid Flow Through 180 Degree Channel Proceedings of Fifth ASCE-EMD Conference, August 1-3, 1984, University of Wyoming, Laramie, pp. 815-818.

11. On the Use of Finite Elements in Plastic Fluid Flow, Ibid, pp. 851-854.

12. Free Convection Heat Transfer in Shallow Cylindrical Sectors Using Penalty Finite Elements, Proceedings of the 21st Annual Meeting of the Society of Engineering Science, October 15-17, 1984, Virginia Polytechnic Institute and State University.

13. A Numerical Solution of the Flow of Viscoplastic Fluids through 180 Degree Channels, Ibid.

14. The Solution of Newtonian and Moderately Non-Newtonian Fluid Flow and Heat Transfer in Curved Channels, Proceedings of the ASME Winter Annual Meeting, December 9-14, 1984, New Orleans.

15. A Numerical Solution of Free Convection Heat Transfer in Vertical Cylindrical Enclosures, Ibid.

16. A Numerical Investigation of Benard Convection Using the Finite Element Method, Computers and Fluids, Vol. 14, pp. 379-391, 1986.

17. A Study of the Effect of Aspect Ratio on Benard Convection, International Communications in Heat and Mass Transfer, Vol. 14, No. 2, pp. 201-209.

18. An Investigation of the Utility of Computational Fluid Dynamics in the Prediction of Structural Active Cooling, Final Report, 1986 USAF-UES Summer Faculty Program.

19. On the Rayleigh Benard Convection Problem in Enclosures, Tenth U.S. National Congress in Applied Mechanics, Austin, Texas, June 16-20, 1986.

20. On the Nonisothermal Flow of Non-Newtonian Fluids in Sinusoidal Channels, 2nd ASME-JSME Thermal Engineering Joint Conference, March 22-27, 1987, Honolulu.

21. A Numerical Investigation of Double Diffusive Convective Flows Using the Fitness Element Method, 5th International Conference on Numerical Methods in Thermal Problems, June 29-July 3, 1987, Montreal.

22. On Nonisothermal Flow of Bingham Plastics, ASME-AIChE National Heat Transfer Conference, Pittsburgh, August 7-11, 1987.

23. A Finite Element Solution of Double Diffusive Convection, International Communications in Heat and Mass Transfer, Vol. 15, pp. 165-177, 1988.

24. The Effects of Curvature and Orientation on Benard Convection in a Cylindrical Annular Segment, ASME Winter Annual Meeting, Boston, Dec. 13-18, 1988.

25. A Numerical Study of Heat Transfer and Fluid Friction in Viscous Flow Across Banks of Tubes, Second International Symposium on Rotating Machinery, April 3-6, 1988, Honolulu.

26. A Comparison of Mixed and Penalty Finite Element Met6hods in the Analysis of Pin-Fin Heat Exchangers, ASME-AIChE National Heat Transfer Conference, July 24-28, 1988, Houston.

27. On Double Diffusive Convection in a Rectangular Box, ASME-AIChE National Heat Transfer Conference, July 24-28, 1988, Houston.

28. Development of a Technique for Prediction of Internal Heat Transfer in Actively Cooled Structures, Final Report, AFOSR Contract No. F49620-85-C-0013/SB5851-0360, April 1988.

29. On the Heat Transfer Characteristics in a Diamond Shaped Fin Heat Exchanger, ASME Winter Annual Meeting, Nov. 28 – Dec. 2, 1989, Chicago.

30. Natural Convection Around a Cylinder Buried in a Porous Medium – Non-Darcian Effects, Invited Paper, 2nd International Symposium on Cold Regions Heat Transfer, June 28-30, 1989, Sapporo, Japan.

31. Natural Convection Heat Transfer in Concentric Cylinders Enclosing a Porous Medium – Effect of Radius Ratio, Proceedings of the 5th International Conference on Numerical Methods in Thermal Problems, Swansea, July 3-7, 1989.

32. On the Modeling of q-f Turbulence Equations Using the Finite Element Method, Proceedings of the 5th International Conference on Numerical Methods in Laminar and Turbulent Flow, Swansea, July 11-15, 1989.

33. Natural Convection in Porous Media Between Concentric and Eccentric Cylinders, AIChE Symposium Series, Vol. 85, 1989, pp. 96-102.

34. Natural Convection Heat Transfer in Cylindrical Annuli Enclosing a Porous Medium – Effects of Prandtl and Darcy Number, 28th Aerospace Sciences meeting, January 8-11, 1990. Reno.

35. A Finite Element Study of Stability of Fluid Motion in Porous Media – Non-Darcian Effects, Heat and Mass Transfer in Frost and Ice, Packed Beds, and Environmental Discharges, ASME HTD-Vol. 39, pp. 77-84.

36. On the Application of the Finite Element Method to Viscoplastic Materials, Proceedings of 1st International Conference on Structural Testing and Design, July 29-Aug. 3, 1990, Bangalore, India.

37. A Study of Non-Darcian Effects on Forced Convection Heat Transfer over a Cylinder Embedded in a Porous Medium, Heat Transfer 1990, Proceedings of 9th International Heat Transfer Conference, pp. 201-206, Aug. 19-24, 1990, Jerusalem.

38. A Numerical Investigation of Rayleigh Benard Convection for Non-Newtonian Fluids Using Finite Elements, Proc. Of Second World Congress on Computational Mechanics, pp. 503-506, Aug. 27-31, 1990, Stuttgart.

39. An Algorithm for Finite Element Modeling of Nonisothermal Flows Using the q-f Turbulence Model, Ibid, pp. 524-527, Aug. 27-31, 1990, Stuttgart.

40. Hydrogen Flow in Porous Media with Application to Transpiration Cooling, Hydrogen Conference, July 24-26, 1990, Honolulu.

41. The Properties of Numerical Solutions of Isothermal q-f Turbulence Equations Using Finite Elements, International Communications in Heat and Mass Transfer, Vol. 17, pp. 201-213, 1990.

42. On Rayleigh Benard Convection of Bingham Plastics, Proceedings of Second Pan American Congress in Applied Mechanics, Valparaiso, Chile, pp. 469-472, Jan. 3-6, 1991.

43. Viscoelastic Material Property Characterization of Flex Ink, Final Report, Summer Research, Tektronix, Inc., July 1992.

44. ON the Application of CFD Methods in the Design of Heat Exchangers, Quality Through Engineering Design, Bangalore, India, Jan. 93.

45. A Study of Benard Convection for Non-Newtonain Fluids with Temperature Dependent Viscosity, Proc. Of Eighth International Conference on Numerical Methods in Laminar and Turbulent Flow, Swansea, England, pp. 529-538, July 18-23, 1993.

46. A Numerical Study of Rayleigh Benard Convection in Poiseuille flows of Non-Newtonian Fluids, M.S. Thesis, Mr. John Albers, University of Portland, Dec. 1991.

47. Natural Convection Around a Cylinder Buried in a Porous Medium – Non-Darcian Effects Effects, Applied Mathematical Modelling, Vol. 18, pp. 134-141, 1994.

48. On Nonisothermal flows of Bingham Plastics, Chemical Engineering Communications, Vol. 126, pp. 127-140, 1993.

49. A Numerical Study of the Study of Themlhaline Convection in a Rectangular Box Containing a Porous Medium, International Comm. In Heat and Mass Transfer, Vol. 21, No. 2, pp. 261-269, 1994.

50. The Heat Transfer Characteristics of the Benard Poiseuille Problem for Newtonian and Slightly non-Newtonian Fluids, Computers and Fluids, submitted for consideration.

51. A Numerical Investigation of Cooling of Leading Edge of Turbine Blade Using Forced Convection Heat Transfer, ISROMAC-5.

52. Optimization of Pipe flows, Second National Systems Conference, Dec. 1994, Dayalbagh Education Institute, Dayalbagh, India.

53. Hydraulic Turbines, Chapter 12 in Handbook of Turbomachinery, Editor, Prof. Earl Logan, Mercel Dekker, Inc., 1994. Second edition of the same to appear in April 2001.

54. On the Benard-Poiseuille Problem for Newtonian and Slightly Non-Newtonian fluids – A Numerical Study, Proceedings of Third ISHME-ASME Heat and Mass Transfer Conference, Dec. 29-31, 1997, Indian Institute of Technology, Kanpur, pp. 369-374.

55. Some Ideas of Benchmarking computer Codes in Computational Mechanics, CFD, and Heat Transfer, Proceedings of Computational Technologies for Fluid/Thermal/Structural/Chemical Systems with Industrial Applications, Volume 1, July 26-30, 1998, Dan Diego, pp. 153-159.

56. An Efficient Benchamrking Procedure in Computational Mechanics, Computational Fluid Dynamics, and Heat Transfer, ASME Fluids Engineering Conference, June 16-20, Washington, D.C.

57. Experimental Procedures for Characterizing the Viscoelastic Properties of Certain Materials, Symposium on Rheology and fluid mechanics of Nonlinear Materials, ASME IMEC&E 1999, Nashville, Nov. 14-19, 1999.

58. A Numerical Simulation of Heat Pipe Application to the Cooling of Pulse Detonation Engines, Proceedings of 4th ASME/JSME Joint Fluids Engineering Conference, July 6 – 10, 2003, Honolulu, Hawaii.

59. A Reliable Procedure for Testing the Accuracy of Numerical Algorithms in CFD and Heat Transfer, Proceedings of IMEC&E 2001, New York, Nov. 11 – 16, 2001.

60. Benchmarking Procedures in Computational Mechanics, CFD, and Heat Transfer: Are Experiments the Best Answer?, CHT'01, Advances in Computational Heat Transfer, Proceedings of a Symposium organized by the ICHMT, Palm Cove, Queensland, Australia, May 20 – 25, 2001, pp. 1337 – 1344.

61. A Unified Treatmant of Benard Convection in Newtonian, Non-newtonian, Porous Media and Double Diffusive Flows, Proceedings of 20st National and 9th ISHMT-ASME Heat and Mass Transfer Conference, January 2010, Mumbai, India

62. On Validation and Verification in Computational Mechanics, CFD, and CHT, Proceedings of 21st National and 10th ISHMT-ASME Heat and Mass Transfer Conference, December 2011, Chennai, India

63. Spent a sabbatical teaching a course "Turbomachinery" at Indian Institute of Technology, Hyderabad, India during Fall 2016

64. Author of textbook, *Turbomachinery --- Concepts, Applications, and Design*, CRC Press, 2018.

Research Interests:

1. Evaluation of Heat Exchanger Effectiveness Using the Finite Element Method.

2. Curvature Effects on Fluid Flow and Heat transfer.

3. Numerical Simulation of Biological Fluid Flow.

4. Numerical Study of Stability of Fluid Flow due to Benard Convection a Double Diffusive Convection in Newtonian and non-Newtonian fluids.

5. Free and forced convection in porous media flow with emphasis on non-Darcian models.

6. Finite element modeling of turbulence especially the q-f turbulence model.

7. Numerical modeling of phase change problems to include both solid/liquid and liquid/vapour phase changes.

8. Numerical modeling of compressible flows using finite elements.

9. Experimental research involving viscoelastic material property characterization of printing inks.

Academic Appointments:

1. Graduate Teaching Assistant: September 1974 – August 1977, Department of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, Norman.

2. Graduate Teaching Assistant: September 1977 – May 1980, Department of Aerospace Engineering and Engineering Mechanics, University of Texas, Austin.

3. Assistant Instructor: September 1980 – August 1981, Department of Aerospace Engineering and Engineering Mechanics, University of Texas, Austin.

4. Assistant Professor: September 1981 – August 1985, School of Engineering, University of Portland, Portland.

5. Associate Professor: September 1985 – August 1993, School of Engineering, University of Portland, Portland.

6. Applied and received tenure at University of Portland, April 1987.

7. Adjunct Associate Professor, Department of Materials Science, Oregon Graduate Center, January 1987 – June 1988.

8. Adjunct Associate Professor, Department of Materials Science, Oregon Graduate Institute, January 1990 – June 1990.

9. Professor, September 1993 – present, School of Engineering, University of Portland, Portland.

10. Chair, Department of Mechanical Engineering, June 1996 – 2002, 2003 – 2005, University of Portland, Portland.

Membership in Professional Societies:

Member, American Society of Mechanical Engineers

Awards, Fellowships, and Honours:

1. Spent ten weeks (June 3 – August 14, 1986) as a USAF-UES Faculty Fellow at Wright Patterson Air Force Base. This Fellowship is sponsored by the Air Force Office of Scientific Research.

2. Received the Outstanding Adjunct Instructor Award in July 1987 at the Oregon Graduate Center for the course on Introduction to Finite Element Method. This course was offered in Winter quarter, 1987 at the Oregon Graduate Center.

3. Presented an invited lecture on "Numerical Solution of Fluid Flow and Heat Transfer Problems Using the Finite Element method", at Asian Institute of Technology, July 1987.

4. Chaired a Session on "Snow Melting", at the 1989 International Symposium on Cold Regions Heat Transfer, held in Sapporo, Japan, June 28-30, 1989.

5. Presented an invited lecture entitled, "Numerical Solution of Fluid Flow and Heat Transfer Problems Using the Finite Element method", at Tohoku University, Sendai, on July 18, 1990. (Invited by Dr. Takeo Saitoh).

6. Presented an invited lecture entitled "Numerical Solution of Fluid Flow and Heat transfer Problems Using the Finite Element Method", at Institute of Industrial Science, University of Tokyo on July 19, 1990. (Invited by Prof. Toshio Kobayashi and Dr. N. Taniguchi).

7. Chaired a Session at The First International Conference on Structural Testing and Design, held at Bangalore, India, July 29-August 3, 1990.

8. Spent the year 1988 – 1989 on sabbatical leave at Wright Patterson Air Force Base doing research on Computational Fluid Dynamics methods applied to design of cryogenic fuel tanks.

9. Presented an invited lecture entitled "Numerical Solution of Fluid Flow and Heat Transfer problems Using the Finite Element Method", at Aeronautical Development Agency, Bangalore, India, January 12, 1993.

10. Visiting Scientist, Spent approximately twelve weeks from May 9 to July 29, 1994 at Silsoe Research Institute, UK, performing research on two phase flow mixtures of foods and food analogues.

11. Visiting Fellow, Spent approximately five weeks from July 17 to August 25, 1995 and again in Summer 1997 at Dayalbagh Engineering College, DEI, Agra, India, teaching courses on fluid mechanics and optimization.

12. Spent eight weeks (May – July 1997) as Summer Faculty Fellow under the Summer Faculty Research Program at the Wright Patterson Air Force Base. Topic of research was thermal ablation problems of space vehicles with the Air Vehicles Directorate.

13. Spent the Spring and Summer of 2000 (January – August) with the US Army Corps of Engineers. Project was on the Rehabilitation of hydraulic turbines on Ozark river in Arkansas. Provided technical expertise in writing proposals for contractors.

14. Spent four weeks in July 2001 as Summer Faculty Fellow under the Summer Faculty Research Program at the Wright Patterson Air Force Base. Topic of research thermal protection systems for extreme environments using heat pipes.

15. Spent Fall 2008 as Visiting Professor, Faculty of Engineering, Dayalbagh Educational Institute, Deemed University, Agra, India. Taught courses in mechanical engineering discipline.

16. Spent parts of every summer with the US Army Corps of Engineers doing various projects including finite element analysis, optimization, turbine testing, pipe flow analysis. This work had direct impact on technical elective ME 415/515 Turbomachinery.

University Service:

Member, Shiley Engineering Faculty Grants Committee 2019
Member, IRB Committee, 2017-present
Writing in Discipline, Chair 2017-current
Member, CS Faculty Search Committee, 2018
Member, CS Faculty Search Committee, 2017-2018
Member, Shiley School of Engineering Scholarship Committee, 2018-19
Member, Engineering Computer Committee, 2012
Member, Committee on Course Embedded Assessment, Shiley School of Engineering, 2011
Member, EGR 111 Curriculum Committee, 2011.
Chair, Ad hoc Committee on Course Embedded Assessment, School of Engineering, 2006
Member, Committee on Rank and Tenure, 1998 – 1999, 2000 – 2004
Chair, Committee on Rank and Tenure, 2002-2004
Chair, Mechanical Engineering Program, 1996 – 2002, 2003 - 2005
Member, Faculty Welfare Committee, 1990 – 1998
Member of the Senate, 1991 – 1994
Chair, Committee on Faculty Welfare Committee, 1992 – 1994
Member of UCTC, 1989 – 1992
Member of Senate, 1986 – 1988
Member, Committee on Graduate Studies and Research, 1985 – 1988, 1989 – 1990
Chair, Committee on Graduate Studies and Research, 1987 – 1988
Judge of JETS Faire, Several times over the past few years
Member of Technician Selection committee, 1987
Member, Engineering Committee on Academic Computing, ECAC
Chair, Ad hoc Math Committee to evaluate EGR 507 and 508, 1989 – 1990
Respondent of Evaluation Committee of UPARC