CHARBEL FARHAT

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Professor, Department of Mechanical Engineering
and Institute for Computational and Mathematical Engineering
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RESEARCH INTERESTS

Acoustic Scattering, Aeroelasticity, Aerothermodynamics, Computational Engineering and Computational Mechanics, Coupled Field Problems, Dynamic Data-Driven Systems, Engineering Software Systems, Fluid-Structure Interaction, High Performance Computing, Multiscale Analysis, Numerical Analysis, Real-Time Computing, Reduced-Order Modeling, Scientific Visualization, System Identification.

EDUCATION

B.S. (1983)	Ecole Centrale des Arts et Manufactures, France, Diploma of Engineering
M.S. (1983)	Université de Paris VI, France, Applied Mechanics
M.S. (1984)	University of California, Berkeley, Structural Engineering and Structural Mechanics
M.S. (1986)	University of California, Berkeley, Electrical Engineering and Computer Sciences
Ph.D. (1986)	University of California, Berkeley, Civil Engineering

ACADEMIC EXPERIENCE

2007-	**Director**, Army High Performance Computing Research Center, Stanford University
2004-	**Professor**, Department of Mechanical Engineering, Institute for Computational and Mathematical Engineering, and Department of Aeronautics and Astronautics (by courtesy), Stanford University
2000-2004	**Chair**, Department of Aerospace Engineering Sciences, University of Colorado at Boulder
1999-2000	**Interim Chair**, Department of Aerospace Engineering Sciences, University of Colorado at Boulder
1996-2004	**Director**, Center for Aerospace Structures, University of Colorado at Boulder
1995-2004	**Professor**, Department of Aerospace Engineering Sciences, Center for Aerospace Structures, and Center for Applied Parallel Processing, University of Colorado at Boulder
1990-1995	**Associate Professor**, Department of Aerospace Engineering Sciences, Center for Aerospace Structures, Center for Space Construction, and Center for Applied Parallel Processing, University of Colorado at Boulder
1987-1990	**Assistant Professor**, Department of Aerospace Engineering Sciences, Center for Space Structures and Controls, Center for Space Construction, and Center for Applied Parallel Processing, University of Colorado at Boulder

HONORS AND AWARDS

- Who's Who in Higher Education Engineering (2006)
- Who's Who in Computational Science and Engineering (2005)
- Fellow of the American Society of Mechanical Engineers (ASME, 2003)
- The Subaru Educator Spotlight (Subaru, 2003)
- The Gordon Bell Award (IEEE, 2002)
- The Computational Mechanics Award (IACM, 2002)
- Fellow of the International Association of Computational Mechanics (IACM, 2002)
- Co-author paper winner of Robert J. Melosh Competition at Duke University (Duke University, 2002)
- Fellow of the World Innovation Foundation (WIF, 2001)
- Engineer of the Year (AIAA Rocky Mountain Section, 2001)
- The 2001 Modeling and Simulation Award (Department of Defense, 2001)
- The Computational and Applied Sciences Medal (USACM, 2001)
- Fellow of the US Association of Computational Mechanics (USACM, 2001)
- Fellow of the American Institute of Aeronautics and Astronautics (AIAA, 1999)
- The 1998 International Association of Computational Mechanics Young Investigator Award (IACM, 1998)
- The R. H. Gallagher Special Achievement Award for Young Investigators (USACM, 1997)
- The Sidney Fernbach Award (IEEE, 1997)
- The College of Engineering & Applied Sciences Research Award (University of Colorado, 1996)
- The Sup'Prize Achievement Award (IBM, 1995)
- The ASME Aerospace Structures and Materials Best Paper Award (ASME, 1994)
- The Arch T. Colwell Merit Award (SAE, 1993)
- FNRS Fellowship (Belgian National Science Foundation, 1993)
- Research Featured in Yearbook of Science and the Future (Encyclopaedia Britannica, 1992)
- CRAY Research Gigaflop Performance Award (CRAY Research, 1990)
- TRW Fellowship (TRW Foundation, 1989–1992)
- CRAY Research Award (CRAY Foundation, 1989)
- Presidential Young Investigator Award (National Science Foundation, 1989)
- AGARD Lecturer (1988, 1991, 1993, 1995)
- Junior Faculty Development Award (University of Colorado, 1988)
- PACER Fellowship (Control Data Corporation, 1987–1989)

VISITING PROFESSOR/SCIENTIST APPOINTMENTS

- Visiting Professor, Mathématiques Appliquées de Bordeaux, Université de Bordeaux I, France, June 1-30 (2000)
- Visiting Professor, LM2S, Ecole Normale Superieure de Cachan, France, December 1-30 (1997)
- Visiting Professor, CNRS/IUST/Université de Provence, France, June 15-July 15 (1996)
- Visiting Professor, Université de Paris VI, France, and Ecole Normale Superieure de Cachan, France, September 1-October 7 (1995)
- Visiting Professor, ICASE, NASA Langley Research Center, Hampton, Virginia, October 3-10 (1995)
- Visiting Professor, LTAS, Université de Liège, Belgium, June 1-30 (1993)
- Visiting Professor, Institut National de Recherche en Informatique et en Automatique (INRIA), Sophia-Antipolis, France, July 23 - August 23 (1990)
- Visiting Scientist, ECSEC (IBM Rome), Italy, September 1-30 (1989)

SHORT COURSES TAUGHT

- ECCOMAS School, Course on "Advanced Computational Methods for Fluid/Structure Interaction," Ibiza, Spain, May 3-7 (2006)
- Promuval Short Course on "Multidisciplinary Modeling, Simulation and Validation in Aeronautics," Barcelona, Spain, June 28-29 (2004)
- Ecole d'Eté EDF-CEA-INRIA, "Multiphysics Couplings and Multidomain Methods," Saint-Lambert-des-Bois, France, June 14-24 (2004)
- "Domain Decomposition Methods for Structural Mechanics and Acoustic Scattering," Post-Conference Short Course, Fifth U.S. National Congress on Computational Mechanics, Boulder, Colorado, August 4-6 (1999)
- "Strategies and Tools for Parallelising Large Computational Mechanics Codes for Structural, Fluids, Electromagnetics and Multiphysics Analysis," London, England, November 11-12 (1996)
- Ecole d'Eté CEMRACS sur les "Méthodes de Couplage Fluide/Structure," Orsay, France, July 14-21 (1996)
- Troisième Ecole d'Eté GUT-CET sur la "Modélisation Numérique en Thermique," Ile de Porquerolles, France, July 1-6 (1996)
- "Couplage Fluide-Structure," Ecole Polytechnique de Tunis, La Marsa, Tunisia, March 27-29 (1996)
- "Parallelising Large CFD and Structures Codes," AIRPORT European Consortium, Maison des Polytechniciens, Paris, France, November 16-17 (1995)
- "Parallel Computing in Computational Fluid Dynamics," NASA Ames Research Center, Moffett Field, California, October 16-20 (1995)
- "Tutorial sur les Methodes Numériques pour les Grands Systèmes," Ecole Polytechnique de Tunis, La Marsa, Tunisia, September 18-19 (1995)
- "Advanced Course on Computational Fluid Dynamics for Industrial Applications," (COSMASE Course) Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, June 26-30 (1995)

- "Parallel Computing in Computational Fluid Dynamics," von Kármán Institute for Fluid Dynamics, Belgium, May 15-19 (1995)
- "Parallélisation de Grands Codes: Applications Industrielles et à la Recherche," CNRS France, June 7-10 (1994)
- "Recent Advances in Iterative Algorithms for Solving Systems and Eigenvalue Problems," University of Leuven, Belgium, March 22-24 (1994)
- "Domain Decomposition and Parallel Processing in Structural Mechanics," Université de Liège, Belgium, October 6 - October 8 (1992)
- "An Introduction to Parallel Scientific Computations," Université de Liège, Belgium, January 28 - February 1st (1991)

TEACHING AND TRAINING

The University of Colorado at Boulder

Undergraduate Curriculum

- Has designed and developed a new undergraduate course (ASEN 2004) on Aerospace Vehicle Design and Performance that combines analytical, design, and experimental studies.
- Has introduced a new computer-aided structural design course (ASEN 4136) that has consistently attracted more students than the department imposed limit.
- Has developed an original computer visualization software (TOP) to enhance the teaching of stress analysis, structural vibration, and wave propagation. This visualization software is currently used for teaching in this university and for research at over forty major US institutions and industrial companies.
- Has set up, partially funded, and maintained a new departmental undergraduate computer laboratory.
- Has been active as a Structural Advisor of undergraduate students in the Space Grant College Get Away Special (GAS) program, particularly in the structural analysis of the G-285 solar viewing payload that was being readied for a shuttle flight in March 1993.
- Has participated in the development of the Integrated Teaching Laboratory (ITL) as a member of the ITL-HPC Committee.
- Has offered several undergraduate students the opportunity to participate in research projects and has supervised their creative efforts.

Graduate Curriculum

- Has designed a new course on vibrations and structural dynamics.
- Has introduced a new advanced numerical analysis course for computational engineering. This course has consistently attracted over thirty graduate students from the entire College of Engineering.
- Has developed a new graduate course on Variational Methods in Mechanics that has also attracted graduate students from several other engineering departments.
- Has redesigned the concept and requirements of the Ph.D. Preliminary Exam.
- Has set up a state-of-the-art high-performance computer visualization laboratory that currently supports several research projects.

Courses Taught

- Advanced Finite Element Seminar - Graduate Level
- Computational Gas Dynamics - Graduate Level

- Mechanical and Structural Vibrations - Graduate Level
- Computational Engineering Software - Graduate Level
- Variational Methods in Mechanics - Graduate Level
- Advanced Numerical Analysis for Computational Mechanics - Graduate Level
- Flight Mechanics - Undergraduate Level
- Structures II - Required, Undergraduate Level
- Analysis and Design of Space Structures - Undergraduate Level
- Introduction to Aerospace Vehicle Design and Performance - Required, Undergraduate Level
- Introduction to Aerospace Engineering - Undergraduate Level

Undergraduate Students Supervised and Supported

- Thomas Gullaud, Information Technology for Data-Driven Systems (2004)
- Julien Cortial, Time-Decomposed Parallel Solution of Partial Differential Equations (2003-2004)
- Frederic Lechenault, A Data-Driven Environment for Multiphysics Applications (2002-2003)
- Kris van der Zee, Design and Analysis of Partitioned Solution Schemes for the Three-Field Formulation of Aeroelastic Problems (2002)
- Chris Jeppesen, Immersive Visualization of Computational Data (2002)
- Otto Krauss, Adaptive Finite Element Meshing in CFD (2002)
- Jason Lechniak, Finite element modeling of complete F-16 and F-18 aeroelastic configurations (2001-2002)
- Marion Chandesris, Time-parallel Solution of Systems of ODEs (2001-2002)
- Lam Pham, Scientific Visualization and Graphics User Interfaces (1998-2002)
- Ulrich Hetmaniuk, Linearized Aeroelasticity (1998)
- Emily Best, Interactive Two- and Three-dimensional Rendering of Flow Streamlines (1997)
- Matthew Young, Stereoscopy Algorithms for Scientific Visualization and Fast Animation of Contour Plots (1994)
- Chad McArthur, Analysis and Optimization of the Aeroelastic Research Wing ARW-2 (1994)
- Bob Stoner, Object-Oriented Interactive Visualization of Continuum Problems (1992)
- Morgan Jones, Finite Element Modeling and Analysis of a Solar Viewing Payload (1990-1991)
- Malachy Carroll, Finite Element Modeling and Analysis of a Solar Viewing Payload (1990-1991)
- Russell Partch, Scientific and Engineering Visualization (1990)
- William Skaff, Structural Design of a High Speed Civil Transport Wing (1990)
- Rick Stewart, Structural Design of a High Speed Civil Transport Wing (1990)

Master Students Supervised

- Holly Lewis, High-Fidelity Simulation of Aircraft Trimming (2003-2004)
- Rizwan Ansari, Scientific Visualization (2003)
- Jason Lechniak, Numerical Simulation of the Aeroelastic Behavior of Fighters During High-G Maneuvers (2002-2004)

- Paul Wiedemann-Goiran, Discontinuous Galerkin Methods for the Solution of Acoustic Scattering Problems in the Mid-Frequency Regime (2001-2002)
- Charbel Bou-Mosleh, Arbitrary Finite Element Representation of Rigid Body Modes in Computational Mechanics (2001-2002)
- David Carpenter, The Finite Volume Variational Multiscale Large Eddy Simulation Method (2001-2002)
- Ulrich Hetmaniuk, FETI for Structures with Axisymmetric Components (1999)
- Ben Johanson, Finite Element Modeling of Jet Fighters (1999)
- Chris Saam, Computational Geometry Algorithms for Fluid/Structure Interaction Problems (1997)
- Greggory Brown, M.S. Thesis: Analysis of Inflatable Structures (1994)
- Russell Partch, M.S. Thesis: A Methodology for Finite Element Post-Processing Animation (1991)
- Sophie Zurquiyah, M.S. Thesis: Corotational Formulation of Coupled Fluid/Structure Finite Element Problems (1990)
- Yves Dubois Pélerin, M.S. Thesis: Computational Methods for Two-Way Coupled Thermoelastic Problems (1988)

Doctoral Students Supervised

- Ajaykumar Rajasekharan (2004), Doctoral Student, Stanford University
- Charbel Bou-Mosleh, Ph.D. Thesis: Methodologies for Reproducing In-Flight Loads of Aircraft Wings on the Ground and Predicting Their Response to Battle-Induced Damage (2005), Post-Doctoral Assistant, Stanford University
- Chuck Harris, Ph.D. Thesis: Expanding a Flutter Envelope Using Accelerated Flight Data and Application to the F-16 Fighter (2003), Flight Test Engineer, the Edwards Air Force Base
- Ulrich Hetmaniuk, Ph.D. Thesis: Fictitious Domain Decomposition Methods for Partially Axisymmetric Exterior Helmholtz Problems (2002), Research Engineer, the Sandia National Laboratories
- Melike Nikbay, Ph.D. Thesis: Coupled Sensitivity Analysis by Discrete-Analytical Direct and Adjoint Methods with Applications to Aeroelastic Optimization and Sonic Boom Minimization (2002), Assistant Professor of Aeronautics and Astronautics, Istanbul Technical University
- Hai Tran, Ph.D. Thesis: Numerical Simulation of Fluid/Structure Interaction Phenomena in Viscous Dominated Flows (2001), Development Engineer, DuPont, Inc.
- Christoph Degand, Ph.D. Thesis: Moving Grids for Nonlinear Dynamic Aeroelastic Simulations (2001), Software Engineer, CFD Adapco Group (STAR CD)
- Kendall Pierson, Ph.D. Thesis: A Family of Domain Decomposition Methods for the Massively Parallel Solution of Computational Mechanics Problems (2000), Research Engineer, the Sandia National Laboratories
- Antonini Puppin-Macedo, Ph.D. Thesis: Finite Element and Domain Decomposition Methods for Acoustic Scattering Problems (1999), Senior Engineer, Embraer, Inc., Brazil
- Greg Brown, Ph.D. Thesis: The Second Generation Sensitivity Based Element by Element Method for Updating Dynamic Finite Element Models (1999), Computational Mechanics Engineer, SRT, Inc.
- Po-Shu Chen, Ph.D. Thesis: Scalable Substructuring Methods for High Performance Structural Analysis (1997), Research and Development Staff, Ansys, Inc.
- Russell Partch, Ph.D. Thesis: Adaptivity of Space Structures via Thermal Actuators (1995), Staff Scientist, Phillips Laboratory, Edwards Air Force Base, California

- Michel Lesoinne, Ph.D. Thesis: Mathematical Analysis of the Three Field Coupled Aeroelastic Problem (1994), Assistant Professor, Department of Aerospace Engineering Sciences, University of Colorado at Boulder
- Francois Hemez, Ph.D. Thesis: Theoretical and Experimental Correlation between Finite Element Models and Modal Tests for Large Flexible Space Structures (1993), Technical Specialist, Los Alamos National Laboratories
- Paul Stern, Ph.D. Thesis: Unconditionally Stable Staggered Solution Algorithms for Transient Finite Element Analysis of Coupled Thermoelastic Problems (1993), Software Engineer, Fluid Dynamics International, Inc.
- Tzer Yuaan Lin, Ph.D. Thesis: A Multiple Frames of Reference Approach to Aeroelastic Computations: Application to Airfoil Flutter Analysis (1990), Deputy Division Chief, AIDC, Taiwan

Post-Doctoral Assistants Supervised

- Francois Courty (2004)
- Masaki Sato (2003-2004)
- Henri Bavestrello (2002-2004), Post-Doctoral Assistant, Stanford University
- Jing Li (2002-2003), Assistant Professor of Mathematical Sciences, Kent University
- Philip Avery (2001-2004), Post-Doctoral Assistant, Stanford University
- Hai Tran (2001-2003), Development Engineer, DuPont, Inc.
- Gert Rebel (2001-2002), Computational Scientist, Goodyear, Inc.
- Karim Traore (2001)
- Greg Brown (2000-2001), Computational Mechanics Engineer, SRT, Inc.
- Antonini Macedo (2000), Senior Engineer, Embraer, Inc., Brazil
- Philippe Geuzaine (1999-2003), Group Leader, CENAERO, Belgium
- Radek Tezaur (1998-2004), Research Associate, Stanford University
- Rabia Djellouli (1996-2003), Assistant Professor, Department of Mathematics, Northridge University
- Armin Beckert (1999), Research Engineer, the European Aeronautics, Defense, and Space Company, Germany
- Kurt Maute (1998-1999), Assistant Professor, Department of Aerospace Engineering Sciences, University of Colorado at Boulder
- Daniel Rixen (1997-1999), Professor, Mechanical Engineering, Delft University, The Netherlands
- Marcus Sarkis (1997-1998), Assistant Professor, Mathematical Sciences Department, Worcester Polytechnic Institute
- Catherine Lacour (1997), Assistant Professor, Université de Paris VI, France
- Po-Shu Chen (1997), Research and Development Staff, Ansys, Inc.
- Bruno Koobus (1995-1997), Assistant Professor, Université de Montpellier, France
- Michel Lesoinne (1994-1997), Assistant Professor, Department of Aerospace Engineering Sciences, University of Colorado at Boulder
- Paul Stern (1993–1996), Software Development Engineer, Fluid Dynamics International, Inc.
- Francois Hemez (1993-1994), Assistant Professor, Ecole Centrale des Arts et Manufactures, Paris, France
- Nathan Maman (1993-1994), Research and Development Scientist, SIMULOG, Paris, France

- Luis Crivelli (1992-1993), Research and Development Engineer, Hibbitt, Karlsson & Sorensen, Inc.
- Stéphane Lantéri (1992-1993), Chargé de Recherches, INRIA Sophia Antipolis, France
- Florence Roudolff (1992), Senior Research Scientist, ONERA, France
- Eddy Pramono (1990-1992), Senior Engineer, the IC Design Group, Inc.
- Nahil Sobh (1988-1989), Group Leader, Research and Development, ARAMCO

Stanford University

Graduate Curriculum

- Has designed a new course on fluid/structure interactions.

Courses Taught

- Computational Methods in Fluid Mechanics - Graduate Level
- Introduction to Numerical Methods for Engineering - Graduate Level
- Finite Element-Based Modeling and Simulation of Linear Fluid/Structure Interaction Problems - Graduate Level

Undergraduate Students Supervised and Supported

- Climène Dastillung, Performance Analysis of Time-Decomposed Parallel Solution Algorithms (2004-2005)
- Thomas Gullaud, Information Technology for Data-Driven Systems (2005)

Master Students Supervised

- Dalei Wang, Dynamic Data-Driven Systems (2006-2007)
- Vamshi Kongara, Motion Algorithms for Dynamic Viscous CFD Meshes (2005-2006)
- David Amsallem, Accelerated Snapshot Computation for Reduced-Order Modeling (2005-2006)
- Jean Francois Dord, Underwater Imaging using Time Travel-Based Algorithms (2005-2006)
- Thomas Gullaud, High-Speed Interactive Scientific Visualization (2005-2006)
- Fang Sun, Software Architecture for Dynamic Data-Driven Systems (2005)
- Bjarte Haegland, Stability Analysis of Partitioned Procedures for the Solution of Fluid-Structure Interaction Problems (2004-2005)
- Arthur Rallu, Extrapolation Methods for the Treatment of Far-Field Boundary Conditions (2004-2005)

Doctoral Students Supervised

- Brian Flynt (2007–)
- Edmond Chiu (2007–)
- Xianyi Zeng (2007–)
- Kevin Wang (2007–)
- Irina Kalashnikova (2007–)
- Kevin Carlberg (2006–)
- David Amsallem (2006–)
- Jean-Francois Dord (2006–)
- Julien Cortial (2005–)

- Qiqi Wang (2005)
- Arthur Rallu (2005–)
- Ajaykumar Rajasekharan (2004–)
- Charbel Bou-Mosleh (2004-2005)

Post-Doctoral Assistants Supervised

- Goeric Daeninck (2007–)
- Steffen Petersen (2007–)
- Paolo Massimi (2007–)
- Charbel Bou-Mosleh (2006–)
- Debraj Ghosh (2005–)
- Sriram Shankaran (2005-2006)
- Lin Zhang (2005-2006)
- Thuan Lieu (2004–)
- Henri Bavestrello (2004-2005)
- Philip Avery (2004-2006)

Research Associated Mentored

- Philip Avery (2006–)
- Radek Tezaur (2004–)

UNIVERSITY SERVICE ACTIVITIES

The University of Colorado at Boulder

College of Engineering

- Dean Search Committee (2001-2002)
- Vice-Chancellor Internal Campus Review Committee (1998)
- The First Level Review Committee (1997-1999)
- Academic Representative for the CAS Program Plan at NASA Ames Research Center (1993)
- Executive Committee Member, Center for Space Construction (1992-1994)
- Committee for the Study of the Merger of Aerospace Engineering Sciences and Mechanical Engineering (1988)

Department of Aerospace Engineering Sciences

- Chair, Faculty Search Committee (1999)
- Space Needs ad hoc Committee (1997-1998)
- Graduate Committee (1991, 1992-1996)
- Faculty Search Committee (1990)
- Budget Committee (1988, 1989, 1991)
- Teaching and Curriculum Committee (1987, 1988, 1992, 1994)

Stanford University

Office of the Vice Provost and Dean of Research

- Director of Stanford's Office of Science Outreach Search Committee (2007)

Department of Mechanical Engineering

- Faculty Reappointment Committee (2004)
- Admissions Committee (2005, 2006)
- Chair, Better Professional Environment Committee (2005-2006)

Institute for Computational and Mathematical Engineering

- Steering Committee (2005, 2006)
- Graduate Program Committee (2006,2007)

PROFESSIONAL PRACTICE

Consulting Activities

- Aerion, Inc.
- ANALATOM, Inc.
- ANSYS, Inc.
- CFD Research Corporation
- CS Communication et Systèmes, France
- Dassault Aviation, France
- Desktop Aeronautics, Inc.
- European Space Agency, The Netherlands
- Ford Motor Company (CAE Systems)
- GDTech France, Inc.
- Gesellschaft Für Mathematik und Datenverarbeitung, Mbh., Germany
- Goodyear Tire & Rubber Company
- GRI, Inc.
- Lockheed Missiles and Space Company, Inc.
- Lockheed-Martin Aeronautics
- RENAULT (Direction de la Mécanique), France
- RENAULT F1 TEAM, France
- SAMTECH, S.A., Belgium
- Sandia National Laboratories
- Structural Software Development, Inc.
- Systems Technology, Inc.
- TechnoSoft, Inc.

- Toyota Motor Corporation, Japan

Government Agencies

- NATO (AGARD)

PROFESSIONAL SERVICE ACTIVITIES

Professional Societies

- Fellow, International Association of Computational Mechanics (**IACM**)
- Fellow, World Innovation Foundation (**WIF**)
- Fellow, US Association of Computational Mechanics (**USACM**)
- Fellow, American Institute of Aeronautics and Astronautics (**AIAA**)
- Fellow, American Society of Mechanical Engineers (**ASME**)
- Member, Society for Industrial and Applied Mathematics (**SIAM**)
- Corresponding Member, Executive Council, International Association for Computational Mechanics (**IACM, 2006-**)
- Vice-Chair, Society for Industrial and Applied Mathematics' Activity Group on Supercomputing **(SIAG/SC, 2003-2006)**
- Member-at-Large, U. S. Association for Computational Mechanics (**USACM, 1995-2006**)
- General Council Member, International Association for Computational Mechanics (**IACM, 2000-**)

Editorial Boards

- Editor, International Journal for Numerical Methods in Engineering (2007–)
- Editorial Board, Mathematical Modelling and Numerical Analysis (M2AN) (2005–)
- Editorial Board, Communications in Numerical Methods in Engineering (2005–)
- Editorial Board, International Journal for Numerical Methods in Fluids (2005–)
- Editorial Board, International Journal of Computational Methods in Engineering Science and Mechanics (2005–)
- Editorial Board, SIAM Series on Computational Science and Engineering (2004–)
- Associate Editor, AIAA Journal of Aerospace Computing, Information, and Communication (2003)
- Editorial Board, La Revue Européenne des Eléments Finis (2002–)
- Associate Editor, International Journal for Numerical Methods in Engineering (2001–)
- Editor, Computing and Visualization in Science (1998–)
- Editorial Board, Engineering with Computers (1998–)
- Advisory Editorial Board, International Journal for Numerical Methods in Engineering (1998-2001)
- Board of Advisory Editors, Computer Methods in Applied Mechanics and Engineering (1997–)
- Editorial Board, Parallel Computing (1996-2005)
- Editorial Board, SIAM Review (1994-1999)

- Subject Area Editor, The International Journal of High Performance Computing Applications, The MIT Press Journals (1993–)

Editorial Work

- Co-Editor, Proceedings of the Tenth International Meeting on Domain Decomposition Methods for Sciences and Engineering, AMS (1998)
- Co-Editor, Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, SIAM (1989)

Advisory Boards and Committees

- Institut Universitaire des Systèmes Thermiques Industriels (IUSTI), Evaluation Committee (2006)
- Office National d'Études et de Recherches Aérospatiales (ONERA), High Scientific Council (2006-2009)
- Sandia National Laboratory, Sandia Science Advisory Board (2006-)
- Center for Scientific Computing and Optimization in Multidisciplinary Applications (SCOMA), Jyvaskyla, Finland (2005-)
- President's Information Technology Advisory Committee (PITAC), Subcommittee on Computational Science (2004)
- Institut National de Recherche en Informatique et Automatique (INRIA), Thème NumD Panel of Experts (2004)
- National Science Foundation, Simulation-Based Engineering Sciences Initiative Panel (2004)
- National Science Foundation, Information Technology Research Review Panel (2003)
- Sandia National Laboratory, Engineering Sciences Research Foundation's External Review Panel (Chair) (2002-)
- National Research Council (NRC), Army Research Laboratory Technical Assessment Board's Panel on Air and Ground Vehicle Technology (2002-2007)
- The Fourteenth Annual Robert J. Melosh Medal Competition, Duke University (2002)
- National Science Foundation, Advanced Computational Research (2001)
- National Science Foundation, Dynamic Data-Driven Application Systems (2000)
- Ecole Nationale des Ponts et Chaussées, Département de Mathématiques Appliquées (1998-)
- IEEE Awards Committee (1998-)
- National Science Foundation, New Strategic Initiative for FY2000 and Beyond (1998)
- National Science Foundation, Engineering Research Center Review Panel (1997)
- AIAA Structures Technical Committee (1996-2001)
- National Science Foundation, CAREER Awards (1996-1997)
- Computational Aerosciences Review and Planning, NASA Ames Research Center (1994-1997)
- National Science Foundation, MetaCenter Allocations Committee (1994-1996)
- Joint Pittsburgh/Illinois Supercomputing Peer Review Board (1993-1996)
- National Science Foundation, Division of Electrical Communication Systems (1993)
- National Science Foundation, NYI Awards (1993)
- IBM Academy of Science and Technology Study (1993)
- National Science Foundation, ASC Postdoctoral Research Associateship Program (1991)

- National Science Foundation, ASC SBIR Awards (1990)
- Committee on Parallel Processing and Supercomputing, Aerospace Division of **ASCE** (1987-1989)

Workshop and Conference Committees

- Scientific Committee Member, 16th U.S. National Congress on Theoretical and Applied Mechanics, Penn State University, Pennsylvania, June 27-July 2 (2010)
- Scientific Committee Member, 19th U.S. National Congress of Computational Mechanics, Ohio State University, Columbus, Ohio, July XX-XX (2009)
- Fifteenth International Conference on Finite Elements in Flow Problems (FEF09), Tokyo, Japan, April 1-3 (2009)
- International Advisory Board Member, 8th World Congress on Computational Mechanics, Venice, Italy, June 30-July 5 (2008)
- Applications Program Committee, Supercomputing 2007 (SC07), Reno, Nevada, November 10-16 (2007)
- Ninth US National Congress on Computational Mechanics, San Francisco, California, July 22-26 (2007)
- International Organizing Committee Member, 14th International Conference on Finite Elements in Flow Problems (FEF07), Santa Fe, New Mexico, March 26-28 (2007)
- Scientific Committee Member, IUTAM Symposium on Discretization Methods for Evolving Discontinuities, INSA de Lyon, Lyon, France, September 4-7 (2006)
- Scientific Advisory Board, Seventh World Congress on Computational Mechanics, Los Angeles, California, July 16-22 (2006)
- Scientific Committee Member, 15th U.S. National Congress on Theoretical and Applied Mechanics, University of Colorado at Boulder, Boulder, Colorado, June 25-30 (2006)
- Co-Chair, SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, California, February 22-24 (2006)
- Scientific Program Committee Member, Eighth US National Congress on Computational Mechanics, Austin, Texas, July 24-28 (2005)
- Technical Advisory Panel Member, Marine 2005, Computational Methods in Marine Engineering, Oslo, Norway, June 27-29 (2005)
- Technical Advisory Panel Member, Computational Methods for Coupled Problems in Science and Engineering, Santorini Island, Greece, May 25-28 (2005)
- International Organizing Committee Member, Thirteen Conference on Finite Elements for Flow Problems (FEF05), Swansea, United Kingdom, April 4-6 (2005)
- Scientific and Industrial Committee Member, Fourth European Congress on Computational Methods in Applied Sciences and Engineering, Jyvaskyla, Finland, July 24-28 (2004)
- Scientific Program Committee Member, Seventh US National Congress on Computational Mechanics, Albuquerque, New Mexico, July 27-31 (2003)
- Local Organizing and Scientific Committee Member, Multiscale Computational Mechanics for Material and Structures, Cachan, France, September 18-20 (2002)
- Scientific Program Committee Member, International Parallel and Distributed Processing Symposium, Ft. Lauderdale, Florida, April 15-19 (2002)
- Scientific Program Committee Member, Sixth US National Congress on Computational Mechanics, Dearborn, Michigan, August 1-4 (2001)

- Scientific Committee Member, Fourth International Colloquium on Computation of Shell and Spatial Structures, Crete, Greece, June 5-7 (2000)
- Organizing Committee Member, Fifth US National Congress on Computational Mechanics, Boulder, Colorado, August 4-6 (1999)
- Program Committee Member, HPC'ASIA 98 Conference and Exhibition, Singapore, September 22-25 (1998)
- Program Committee Member, Fifth International Symposium on Solving Irregularly Structured Problems in Parallel, Berkeley, California, August 9-11 (1998)
- International Advisory Board Member, Sixth International Conference on Numerical Grid Generation and Computational Field Simulation, Greenwich, England, July 6-9 (1998)
- Chairman, Tenth International Conference on Domain Decomposition Methods in Sciences and Engineering, Boulder, Colorado, August 11-14 (1997)
- International Advisory Committee Member for the Fourth U.S. National Congress on Computational Mechanics, San Francisco, California, August 6-8 (1997)
- Program Committee Member, Frontiers' 96, The Sixth Symposium on the Frontiers of Massively Parallel Computation, Annapolis, Maryland, October 27-31 (1996)
- Organizing Committee Member, The 1995 Engineering Mechanics Conference, Boulder, Colorado, May 22-24 (1995)
- Program Committee Member, Frontiers' 95, The Fifth Symposium on the Frontiers of Massively Parallel Computation, McLean, Virginia, February 6-9 (1995)
- Program Committee Member, 8th ACM International Conference on Supercomputing, Manchester, July 11-15 (1994)
- Host and organizer of the biennial NSF Communications and Computational Systems Grantees Meeting, Boulder, Colorado, May 16-18 (1994)
- Editorial Board, The Second International Conference on Computational Structures Technology, Athens, Greece, August 30-September 1 (1994)
- Member, International Scientific Advisory Committee, First International Conference on Parallel Processing for Computational Mechanics, Southampton, England, September 4-6 (1990)
- Member, Technical Committee, First U.S. Conference on Discrete Element Methods, Golden, Colorado, October 17-18 (1989)
- Theme Chairman, Fourth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, April 9-13 (1989)

PLENARY LECTURES

- Eighth World Congress on Computational Mechanics (WCCM VIII), Venice, Italy, June 30-July 5 (2008)
- Fourteenth International Conference on Finite Elements in Flow Problems, Santa Fe, New Mexico, March 26-28 (2007)
- Seventh World Congress on Computational Mechanics, Los Angeles, California, July 16-22 (2006)
- Challenges in Computational Mechanics, Cachan, France, May 10-12 (2006)
- Septième Colloque de l'Association Calcul de Structures et Modélisations (CSMA), Giens, France, May 17-20 (2005)

- Iberian Congress of Computational Methods in Engineering, Lisbon, Portugal, May 31-June 2 (2004)
- The 2004 SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, California, February 25-27 (2004)
- Third Conference on Numerical Methods in Engineering and Applied Sciences in Latin America, Monterrey, Mexico, January 22-24 (2004)
- CANUM 2000 (32ème Congrès National d'Analyse Numérique), Port d'Albret, France, June 5-9 (2000)
- Fifteenth International Conference on Structural Mechanics in Reactor Technology (SMiRT-15), Seoul, Korea, August 15-20 (1999)
- Fourth European Computational Fluid Dynamics Conference (ECCOMAS), Athens, Greece, September 7-11 (1998)
- Fourth US National Congress on Computational Mechanics, San Francisco, California, August 6-8 (1997)
- 1997 NSF Design and Manufacturing Grantees Conference, Seattle, Washington, January 7-10 (1997)
- IBM STAR Forum, Strategies for Today and Tomorrow, IBM Research Division Headquarters, Yorktown, New York, October 25-27 (1995)
- von Kármán Institute Lecture Series, Belgium, May 15-19 (1995)
- Fifth SIAM Conference on Parallel Processing for Scientific Computing, Houston, Texas, March 25-27 (1991)
- IBM Europe Institute 1988, Supercomputing in Engineering Structures, Oberlech, Austria, July 11-15 (1988)

KEYNOTE AND INVITED LECTURES

- Thirty-Second Conference of the Dutch-Flemish Numerical Analysis Communities, Woudschoten, Zeist, October 3-5 (2007)
- Invited Lecture, Collaborative Research Center on "Flow Modulation and Fluid-Structure Interaction at Airplane Wings," RWTH Aachen University, Aachen, Germany, September 14 (2007)
- Ninth US National Congress on Computational Mechanics, San Francisco, California, July 22-26 (2007)
- International Conference on Computational Methods for Coupled Problems in Science and Engineering, Ibiza, Spain, May 21-23 (2007)
- International Workshop on Higher-Order Finite Element Methods, Herrsching am Ammersee, Germany, May 17-19 (2007)
- XV Congreso Sobre Métodos Numéricos y sus Aplicaciones (ENIEF 2006), Santa Fe, Argentina, November 7-10 (2006)
- Tenth Annual ASME PVP Meeting, Vancouver, Canada, July 25-28 (2006)
- Seventh World Congress on Computational Mechanics, Los Angeles, California, July 16-22 (2006)
- The Fourth International Symposium on Computational Wind Engineering (CWE2006), Yokohama, Japan, July 16-19 (2006)
- Interdisciplinary Multiscale Computational Methodologies, Research Triangle Park, North Carolina, June 14-15 (2006)
- International Meeting on Grid and Parallel Computing, Beirut, Lebanon, January 4-7 (2006)
- First International Seminar on Innovative Scientific Computing for Challenging Multidisciplinary Applications: Methods, Tools and Collaborative Environments, Jyvaskyla, Finland, October 3-5 (2005)

- Eighth US National Conference on Computational Mechanics, Austin, Texas, August 24-28 (2005)
- Third IMACS Conference on Mathematical Modelling and Computational Methods, Pilsen, Czech Republic, July 4-8 (2005)
- Thirteenth Conference on Finite Elements for Flow Problems (FEF05), Swansea, United Kingdom, April 4-6 (2005)
- Sixth World Congress on Computational Mechanics (WCCM VI), Beijing, China, September 5-10 (2004)
- Fourth European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), Jyvaskyla, Finland, July 24-28 (2004)
- IMET 2004, Iterative Methods, Preconditioning and Numerical PDEs, Prague, Czech Republic, May 25-28 (2004)
- Second Sandia Workshop on PDE-Constrained Optimization: Toward Real-time and Online PDE-constrained Optimization, Santa Fe, New Mexico, May 19-21 (2004)
- Advances in Computational Mechanics, A Conference Celebrating the 60th Birthday of Thomas J. R. Hughes, Houston, Texas, April 7-9 (2004)
- Seventh US National Congress on Computational Mechanics, Albuquerque, New Mexico, July 27-31 (2003)
- Fifteenth International Conference on Domain Decomposition Methods, Berlin, Germany, July 21-25 (2003)
- IMAMM'03, Industrial Mathematics and Mathematical Modeling, Roznov, Czech Republic, June 30-July 4 (2003)
- EuroConference on Problem Solving Environments and the Information Society, Albufeira, Portugal, June 14-19 (2003)
- 50th AGM and Conference of the Canadian Aeronautics and Space Institute, Montréal, Canada, April 28-30 (2003)
- First South-American Congress on Computational Mechanics, Parana, Argentine, October 28-31 (2002)
- Multi-scale Computational Mechanics for Materials and Structures, Cachan, France, September 18-20 (2002)
- International Workshop on Modeling and Simulation of Fluid/Structure/Acoustic Interaction, University of Stuttgart, Germany, September 9-11 (2002)
- PET Workshop on Fluid-Structure Interactions, Mississippi State University, Mississippi, July 30-11 (2002)
- Fifth World Congress on Computational Mechanics (WCCM V), Austria, July 7-12 (2002)
- 2002 PET Frontier Lecture Series, High Performance Technologies, Inc., Aberdeen, Maryland, March 11-12 (2002)
- Iterative Solvers for Large Linear Systems, A Conference Commemorating 50 Years of Conjugate Gradients, ETH Zurich, Switzerland, February 18-21 (2002)
- 40th Aerospace Sciences Meeting and Exhibit (AIAA), Reno, Nevada, January 14-17 (2002)
- 2nd European Conference on Computational Mechanics (ECCM), Solids, Structures, and Coupled Problems in Engineering, Cracow, Poland, June 26-29 (2001)
- Workshop on Domain Decomposition Methods, ETH Zurich, Switzerland, June 7-8 (2001)
- ParCFD2001 (Parallel Computational Fluid Dynamics), Egmond aan Zee, The Netherlands, May 21-23 (2001)

- Second AMIF (Applied Mathematics for Industrial Flows) International Conference, Il Ciocco, Tuscany, Italy, October 12-14 (2000)
- XX CILAMCE (Iberian Latin-American Conference on Computational Methods in Engineering), Sao Paulo, Brasil, November 3-5 (1999)
- Computational Modeling and Applications, LNCC, Petropolis, Rio de Janeiro, Brazil, July 12-15 (1999)
- International Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Industrial Applications, Minneapolis, Minnesota, June 10-12 (1999)
- Fourth Mississippi State Conference on Differential Equations and Computational Simulations, Starkville, Mississippi, May 21-22 (1999)
- ICTCA'99, Fourth International Conference on Theoretical and Computational Acoustics, Trieste, Italy, May 10-14 (1999)
- International Symposium on Computational Methods for Fluid-Structure Interaction, Trondheim, Norway, February 15-17 (1999)
- Workshop on Recent Advances in Computational Structural Dynamics and High Performance Computing, USAE Waterways Experiment Station, Vicksburg, MS, November 3-4 (1998)
- MAPINT'98/MDICE, Wright Patterson Air Force Base, Dayton, Ohio, August 25-27 (1998)
- ICASE/LaRC Aero-Structure Workshop, Hampton, Virginia, August 3-4 (1998)
- Eleventh International Conference on Domain Decomposition Methods, London, England, July 20-24 (1998)
- Fourth World Congress on Computational Mechanics, Buenos Aires, Argentina, June 29-July 2 (1998)
- 29th AIAA Fluid Dynamics Meeting, Albuquerque, NM, June 15-18 (1998)
- Workshop on Domain Decomposition and Multifields in Fluid and Solid Mechanics, Sollerhaus, Austria, April 26-May 2 (1998)
- A Conference on Numerical Analysis and Domain Decomposition in honor of Olof B. Widlund on the Occasion of his 60th Birthday, Courant Institute of Mathematical Sciences, New York, January 23-24 (1998)
- XVIII CILAMCE (Iberian Latin-American Conference on Computational Methods in Engineering), Brasilia, Bresil, October 29-31 (1997)
- Numerical Unsteady Aerodynamic and Aeroelastic Simulation, 85th Meeting of the Structures and Materials Panel, AGARD-NATO, RTO, Aalborg, Denmark, October 14-15 (1997)
- Computational Aerodynamics - Past, Present and Future, The Boeing Company, Seattle, September 26-27 (1997)
- MAPINT'97 (Multi-disciplinary Applications and Interoperable Computing), Science and Engineering, Wright Patterson Air Force Base, Dayton, Ohio, June 16-18 (1997)
- Ninth International Conference on Domain Decomposition Methods in Science and Engineering, Bergen, Norway, June 3-8 (1996)
- Seventh International ANSYS Conference and Exhibition, Pittsburgh, Pensylvania, May 20-22 (1996)
- Workshop on Recent Advances in Computational Structural Dynamics and High Performance Computing, USAE Waterways Experiment Station, Vicksburg, MS, April 24-26 (1996)
- Couplage Fluide-Structure, Ecole Polytechnique de Tunis, La Marsa, Tunisia, March 27-29 (1996)
- Séminaire sur les Architectures Logicielles, Ecole Nationale Supérieure d'Informatique et d'Analyse de Systèmes, Rabat, Morocco, March 6-9 (1996)

- SUP'EUR 95, High Performance Computing in Europe, Madrid, Spain, September 25-27 (1995)
- ENUMATH 95, The First European Conference on Numerical Mathematics and Advanced Applications, Paris, France, September 18-22 (1995)
- Colloque sur les Modélisations et Méthodes Numériques en Ingéniérie Pétrolière, Ecole Polytechnique Tunis, La Marsa, Tunisia, September 20-21 (1995)
- Calcul à Hautes Frequences et Parallelisme en Electromagnetisme, Institut Galilee, Universite Paris XIII, Paris, France, May 22-23 (1995)
- Scientific Computing 95, Baptist University, Hong-Kong, May 12-13 (1995)
- Parallelisme en Mecanique des Solides et des Structures, Paris, France, December 6 (1994)
- IV Argentine Congress of Computational Mechanics (MECOM'94), Mar del Plata, Argentine, November 8-11 (1994)
- Les Premieres Journees Maghrebines de Mathematiques Appliquees, Bizerte, Tunisia, November 1-5 (1994)
- Second European Computational Fluid Dynamics Conference (ECCOMAS), Stuttgart, Germany, September 5-8 (1994)
- Sixth International Conference on Physics Computing, Lugano, Switzerland, August 22-26 (1994)
- Sixth International Congress on Computational and Applied Mathematics (ICCAM 94), Leuven, Belgium, July 25-30 (1994)
- The Eurosim 1994 International Conference on Massively Parallel Processing, Delft, The Netherlands, June 21-23 (1994)
- Workshop on Domain-Based Parallelism and Problem Decomposition Methods in Computational Science and Engineering, Minneapolis, Minnesota, April 25-26 (1994)
- Second Japan-US Symposium on Finite Element Methods for Fluid Dynamics, Tokyo, Japan, March 14-16 (1994)
- Symposium on Parallel Finite Element Computations, Minnesota Supercomputer Institute, Minneapolis, October 25-27 (1993)
- NATO Advanced Study Institute on Computer Aided Analysis of Rigid and Flexible Mechanical Systems, Troia, Portugal, June 27-July 9 (1993)
- PARALLEL CFD'93, Paris, France, May 10-12 (1993)
- BEnchmark of Concurrent Architectures for their Use in Scientific Engineering (BECAUSE) European Workshop, Sophia-Antipolis, France, October 13-16 (1992)
- Sixth International Conference on Domain Decomposition Methods in Science and Engineering, Como, Italy, June 15-19 (1992)
- Fifth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, April 9-14 (1992)
- Numerical Methods for Parallel Computers, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, February 9-15 (1992)
- Tenth International Conference on Computing Methods in Applied Sciences and Engineering, Paris, France, February 11-14 (1992)
- First GAMNI/CSM Workshop on Large Flexible Space Structures, Paris, France, December 16-17 (1991)
- 1991 International Conference on Supercomputing, Cologne, Germany, June 17-21 (1991)
- Meeting on Domain Decomposition and Parallel Computing for Partial Differential Equations, ICASE, NASA LaRC, September 24-25 (1990)

- First International Conference on Parallel Processing For Computational Mechanics, Southampton, England, September 4-6 (1990)
- Fourth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, April 1-5 (1990)
- SINTEF/RUNIT University of Trondheim, Series of Lectures on Parallel Numerical Algorithms for Computational Mechanics, Trondheim, Norway, March 26-30 (1989)
- Fourth International Symposium on Science and Engineering on CRAY Supercomputers, Minneapolis, Minnesota, October 12-14 (1988)
- Forum on Advanced Computing, Denver, Colorado, April, 23-24 (1987)

CONTRACTS AND GRANTS (Funded)

Principal Investigator

- Feasibility Study of a Unified CFD-CSD Computational Formulation, NASA Research Announcement, $150,000 (2007-2008)
- Army High Performance Computing Research Center, US Army Research Laboratory, $106,608,773 (2007-2012)
- Multidisciplinary Analysis of Hot Aerospace Structures, Air Force Office of Scientific Research, $300,000 (2007-2010)
- Unsteady CFD Analyses of a Formula One Car, Toyota Motor Corporation, $150,000 (2006-2007)
- Parameterized Aeroelastic Reduced-Order Modeling of Fighters, Air Force Office of Scientific Research, $300,000 (2006-2009)
- A Four-Field Computational Framework for the Aerothermomechanical Analysis of Hypersonic Vehicles, Air Force Office of Scientific Research, $250,000 (2006-2009)
- Physics-Based Multidisciplinary Failure Analysis of Submerged Implodable Volumes, Office of Naval Research, $3,210,000 (2006-2009)
- Multi-Disciplinary Ship Design Environment, TechnoSoft, Inc., $315,000 (2006-2008)
- Buffet and Dynamic Loads Analysis, CMSoft, Inc., $15,302 (2006)
- Implementation of FETI into FEM for CEM Simulation, High Performance Technologies, Inc., $60,000 (2006)
- Acoustic Signatures of Mines Located Near the Ocean Bottom, High Performance Technologies, Inc., $165,000 (2005-2006)
- A Dynamic Data-Driven System for Structural Health Monitoring and Critical Event Prediction, National Science Foundation, $825,000 (2005-2008)
- Aerodynamic/Aeroelastic Effects on a Class of High-Speed Vehicles, Toyota Motor Corporation, $135,000 (2005-2006)
- High-Resolution Methods for the Solution of Direct and Inverse Acoustic Scattering Problems, Office of Naval Research, $750,000 (2005-2008)
- A Scalable Solution Methodology for Speeding up the Modeling of Acoustic Signatures, High Performance Technologies, Inc., $165,000 (2004-2005)
- A Collaborative for Naval Computational Mechanics, Office of Naval Research, $1,350,000 (2004-2007)

- High Performance Computing Modernization Program - Programming Environment and Training (PET), High Performance Technologies, Inc., $400,000 (2003-2007)
- Methodologies for Predicting and Testing the Effects of Combat Damage on Flight Envelopes, Air Force Office of Scientific Research, $1,340,000 (2002-2005)
- Discovery Learning through Multidisciplinary Senior Design Projects, Lockheed-Martin Foundation, $150,000 (2002-2005)
- A Data-Driven Environment for Multiphysics Applications, National Science Foundation, $1,579,834 (2002-2005)
- Scalable Substructuring Methods for Linear and Nonlinear Dynamics Problems, Sandia National Laboratories, $900,000 (2002-2007)
- A Scalable Domain Decomposition Method for the Solution of Contact Problems, National Science Foundation, $41,922 (2002-2004)
- Supersonic Aircraft Shaping Technology for a Constrained Shock Pressure Rise, Nasa Langley Research Center, $150,000 (2002-2003)
- Identification of a Computational Platform for Whole Ship Modeling, Office of Naval Research, $8,000 (2002-2003)
- Evaluation of Computational Aeroelastic Technology, Lockheed-Martin Aeronautics, $20,000 (2002)
- Convergence Analysis of a Component Mode Synthesis Method, Sandia National Laboratories, $12,560 (2002)
- The Discontinuous Enrichment Method for Wave Propagation, The Binational Science Foundation, $150,000 (2001-2003)
- A Scalable Method for the Solution of Contact Problems, Sandia National Laboratories, $75,000 (2001)
- Supersonic Aircraft Shaping Technology for a Constrained Shock Pressure Rise via Structural and Materials Optimization, Defense Advanced Research Projects Agency, $356,000 (2001)
- High-Performance and Fidelity Multidisciplinary Simulation Methods for Supporting and Innovating Flight Testing, Air Force Office of Scientific Research, $1,217,000 (2000-2003)
- An Internet-Based Meta-Model Driven Distributed Workbench for MBS, National Science Foundation, $149,999 (2000-2001)
- Simulation of the Transient Aeroelastic Response of a Realistic Aircraft Configuration During Three-Dimensional High G Maneuvers, Air Force Office of Scientific Research, $548,820 (1999-2001)
- Sensitivity Analysis and Fast Solution Methods for Direct and Inverse Acoustic Scattering Problems, Office of Naval Research, $1,133,772 (1998-2004)
- Scalable Algorithms for Massive Parallel Computations, Sandia National Laboratories, $420,000 (1998-2001)
- High Performance Simulation of Multiphysics Problems in Turbulence, Control, and Structural Design, National Science Foundation, $4,229,564 (1997-2000)
- Real Time Predictive Flutter Analysis and Continuous Parameter Identification of Accelerating Aircraft, Air Force Office of Scientific Research, $1,162,672 (1997-2000)
- Numerical Simulation of Three-Dimensional High G Dynamic Maneuvers of a Complete Aircraft Configuration, Air Force Office of Scientific Research, $483,730 (1997-1998)
- Domain Decomposition Methods for Scientific and Engineering Problems, National Science Foundation, $31,990 (1997-1998)

- HPCC Methodologies for Structural Design and Analysis on Parallel and Distributed Computing Platforms, NASA Langley Research Center, $219,000 (1996-1999)
- Domain Decomposition Methods for Scientific and Engineering Problems, National Science Foundation, $38,000 (1996-1999)
- HPC Methods for Coupled Fluid/Structure/Control Problems, National Science Foundation, $88,200 (1996-1998)
- Sensitivity Analysis of Coupled Acoustic Problems to Structural Boundary Conditions and Efficient Numerical Solution Algorithms, Office of Naval Research, $481,000 (1995-1998)
- Domain Decomposition Methods in Science and Engineering, National Science Foundation, $30,000 (1995-1996)
- High Performance Solution of Three-Dimensional Nonlinear Transient Aeroelastic Problems, National Science Foundation, $88,200 (1995-1996)
- Supplement to President Young Investigator Award, National Science Foundation, $29,117 (1995)
- Supplement to President Young Investigator Award, National Science Foundation, $14,976 (1994)
- Coupled Fields and GAFD Turbulence, National Science Foundation (Grand Challenges Award), $4,500,000, (15
- Massively Parallel and Scalable Implicit Time Integration Algorithms for Structural Dynamics, NASA Ames Research Center, $225,000 (1992-1995)
- High Performance Computational Methods for Structural Mechanics, National Science Foundation, $96,000 (1992-1994)
- The Front Range Consortium, Defense Advanced Research Projects Agency, $5,650,000 (1991-1994)
- High Performance Substructuring Algorithms for Massively Parallel Architectures, NASA Langley Research Center, $270,000 (1991-1994)
- Massively Parallel CFD Computations, National Science Foundation, $50,000 (1991-1994)
- President Young Investigator Award, National Science Foundation, $250,000 (1989-1994)
- President Young Investigator Award, Matching Funds from Lockheed M.S.C., CRAY Research Foundation, TRW Research Foundation, Michelin (France), Aerospatiale (France), and Framatome (France), $250,000 (1989-1994)
- Concurrent Processing Methods for Nonlinear Structural Dynamics, National Science Foundation, $292,968 (1988-1990)
- Concurrent Finite Element Computations on the Connection Machine, Naval Research Laboratory, $60,411 (1988-1989)
- Concurrent Finite Element Analysis on the ETA-10, Control Data Corporation, $50,000 (1987-1989)

Co-Principal Investigator and Percentage

- Hybrid Unsteady Simulation for Helicopters, Defense Advanced Research Projects Agency, (25%), $1,803,472 (2004-2006)
- Collaborative Research: Acquisition of an IBM BlueGene/L Supercomputer, National Science Foundation, (25%), $1,053,558 (2004-2007)
- High-Performance and High-fidelity Aeroelastic Simulation of Fixed Wing Aircraft with Deployable Control Surfaces, Air Force Office of Scientific Research, $298,000, (33%), (2004-2007)
- Computational Methods for the Solution of Three-Dimensional Inverse Acoustic and Elastoacoustic Scattering Problems, National Science Foundation, $221,538, (50%), (2002-2005)

- Simulation Platform for the Earthquake Response of Reinforced Concrete Structures, National Science Foundation, $150,000, (25%), (2000-2001)
- Development and Applications of the Aerosonde at the University of Colorado, Department of Defense (DURIP), $370,000, (20%), (2000)
- Numerical Prediction of the Performance of Radial Model Coriolis Flowmeters, Direct Measurement Corporation, $30,000, (50%), (1998)
- Parallel Computational Methods for Large-Scale Structural Dynamics, Sandia National Laboratories, $274,957, (33%), (1997-1998)
- Acquisition of a Grand Challenge Data Laboratory, NCSA, University of Illinois (subcontract), $210,216, (50%), (1996-1997)
- A Matrix-Free Parallel Algorithm for Solving Nonlinear Mechanics Problems, Sandia National Laboratories, $101,452, (33%), (1996-1997)
- Domain Decomposition and Multi-Level Techniques in Large-Scale Parallel Computing, $74,000, (33%), (1994-1997)
- High Performance Parallel Analysis of Coupled Problems for Aircraft Propulsion, NASA Lewis Research Center, $469,848, (33%), (1993-1995)
- Space Structure Concepts, Shimizu Corporation, Japan, $700,000, (25%), (1991-1994)
- Advanced Methods Development for Computational Structural Mechanics, NASA Langley Research Center, $697,337, (33%), (1990-1993)
- Parallel Processing and Scientific Applications, Air Force Office of Scientific Research, $750,000, (50%), (1989-1992)
- Analysis, Preliminary Design and Simulation Systems for Control-Structure Interaction Problems, NASA Langley Research Center, $371,797, (33%), (1989-1992)
- Numerical Simulation of Transition in a Compressible Boundary Layer on the Connection Machine, National Science Foundation, $30,000, (50%), (1989-1990)
- Computational Methods and Software Systems for Dynamics and Control of Large Space Structures, NASA Langley Research Center, $191,345, (50%), (1989-1990)
- Center for Space Construction, NASA Headquarters, $10,500,000, (6.5%), (1988-1995)

CONTRACTS AND GRANTS (Pending)

Co-Principal Investigator and Percentage

PUBLICATIONS

Refereed Monographs and Book Chapters

1. J. Michopoulos, P. Tsompanopoulou, E. Houstis, C. Farhat, M. Lesoinne and J. Rice, "Design of a Data-Driven Environment for Multiphysics and Multi-Domain Applications," *Dynamic Data Driven Applications Systems,* ed. F. Darema, Kluwer Academic Publishers, Netherlands, *(in press)*
2. J. Cortial, C. Farhat, M. Rajashekhar and L. Guibas, "Compressed Sensing and Time-Parallel Reduced-Order Modeling for Structural Health Monitoring using a DDDAS," *Lecture Notes in Computer Science,* ed. Y. Shi et al., Springer-Verlag, Vol. 4487, pp. 1171-1179 (2007)

3. J. Cortial and C. Farhat, "A Time-Parallel Implicit Methodology for the Near-Real-Time Solution of Systems of Linear Oscillators," *Real-Time PDE-Constrained Optimization,* ed. L. Biegler, O. Ghattas, M. Heinkenschloss, D. Keyes and B. van Bloemen Waanders, Computational Science and Engineering, SIAM (2007)

4. C. Farhat, J. G. Michopoulos, F. K. Chang, L. J. Guibas and A. J. Lew, "Towards a Dynamic Data Driven System for Structural and Material Health Monitoring," *Lecture Notes in Computer Science,* ed. V. N. Alexandrov, G. D. van Albada, P. M.A. Sloot, and J. Dongarra, Springer-Verlag, Vol. 3993, pp. 456-464 (2006)

5. J. Michopoulos, C. Farhat, E. Houstis, P. Tsompanopoulou, H. Zhang and T. Gullaud, "Dynamic Data Driven Methodologies for Multiphysics System Modeling and Simulation," *Lecture Notes in Computer Science,* ed. V. S. Sunderam, G. D. van Albada, P. M. A. Sloot, et al., Springer-Verlag, Vol. 3515, Part II, pp. 616-623 (2005)

6. C. Farhat, "The Discontinuous Erichment Method (DEM) for Multiscale Analysis," *Septième Colloque National en Calcul des Structures, Giens 2005,* ed. R. Ohayon, J-P. Grellier, A. Rassineux, Hermès Science Publications, Vol. 1 pp. 33-34 (2005)

7. C. Farhat, J. Li, M. Lesoinne and P. Avery, "A FETI Method for the Solution of a Class of Indefinite or Complex Second- or Fourth-Order Problems," *Lecture Notes in Computational Science and Engineering,* ed. R. Kornhuber, R. H. W. Hoppe, D. E. Keyes, J. Periaux, O. Pironneau and J. Xu, Springer-Verlag, Haidelberg, pp. 19-34 (2004)

8. C. Farhat, "CFD-Based Nonlinear Computational Aeroelasticity," *Encyclopedia of Computational Mechanics*, ed. E. Stein, R. De Borst and T. Hughes, John Wiley & Sons, Vol. 3, (2004)

9. R. Djellouli, R. Tezaur and C. Farhat, "On the Solution of Inverse Obstacle Acoustic Scattering Problems with a Limited Aperture," *Mathematical and Numerical Aspects of Wave Propagation,* ed. G. C. Cohen, E. Heikkola, P. Joly and P. Neittaanmaki, Springer, pp. 625-630 (2003)

10. J. Michopoulos, P. Tsompanopoulou, E. Houstis, J. Rice, C. Farhat, M. Lesoinne and F. Lechenault, "DDEMA: a Data-Driven Environment for Multiphysics Applications," *Lecture Notes in Computer Science,* ed. P. M. A. Sloot, D. Abramson, A. Bogdanov, J. J. Dongarra, A. Zomaya and Y. Gorbachev, Springer-Verlag, Haidelberg, Vol. 2660, Part IV, pp. 309-318 (2003)

11. U. Hetmaniuk and C. Farhat, "A Blended Fictitious/Real Domain Decomposition Method for Partially Axisymmetric Exterior Helmholtz Problems with Dirichlet Boundary Conditions," *Recent Developments in Domain Decomposition Methods,* ed. L. F. Pavarino and A. Toselli, Lecture Notes in Computational Science and Engineering, Springer, Vol. 23, pp. 1-26 (2002)

12. C. Farhat and D. Rixen, "Computational Methods: Linear Algebra, Generalized Inverse, SVD," *Encyclopedia of Vibration*, ed. S. G. Braun, D. J. Ewins and S. S. Rao, Academic Press Ltd, pp. 710-720 (2001)

13. C. Farhat and P. LeTallec, "Vistas in Domain Decomposition and Parallel Processing in Computational Mechanics," *Computer Methods in Applied Mechanics and Engineering*, Vol. 184, Nos. 2-4 (2000)

14. C. Farhat, B. Koobus and H. Tran, "Simulation of Vortex Shedding Dominated Flows Past Rigid and Flexible Structures," *Computational Methods for Fluid-Structure Interaction*, ed. T. Kvamsdal, I. Enevoldsen, K. Herfjord, C. B. Jenssen, K. Mehr and S. Norsett, Tapir, pp. 1-30 (1999)

15. C. Farhat and M. Lesoinne, "Fast Staggered Algorithms for the Solution of Three-Dimensional Nonlinear Aeroelastic Problems," AGARD Report R-822, Numerical Unsteady Aerodynamic and Aeroelastic Simulation (l'Aérodynamique instationnaire numérique et la simulation de l'aéroélasticité), North Atlantic Treaty Organization (NATO), March (1998)

16. C. Farhat, "Parallel and Distributed Solution of Coupled Nonlinear Dynamic Aeroelastic Response Problems," *Solving Large-Scale Problems in Mechanics: Parallel and Distributed Computer Applications*, ed. M. Papadrakakis, J. Wiley, pp. 243-302 (1997)

17. C. Farhat, "High Performance Simulation of Coupled Nonlinear Transient Aeroelastic Problems," AGARD Report R-807, Special Course on Parallel Computing in CFD (l'Aérodynamique numérique et le calcul en parallèle), North Atlantic Treaty Organization (NATO), October (1995)

18. C. Farhat, "Optimizing Substructuring Methods for Repeated Right Hand Sides, Scalable Parallel Coarse Solvers, and Global/Local Analysis," *Domain-Based Parallelism and Problem Decomposition Methods in Computational Science and Engineering*, ed. D. Keyes, Y. Saad and D. G. Truhlar, SIAM, pp. 141-160 (1995)
19. C. Farhat and F. X. Roux, "Implicit Parallel Processing in Structural Mechanics," *Computational Mechanics Advances*, Vol. II, No. 1, pp. 1-124 (1994)
20. C. Farhat, "Domain Decomposition and Parallel Processing," *Postgraduate Studies in Supercomputing*, ed. FNRS/NFWO, Université de Liège, Belgium (1992)
21. C. Farhat, "An Introduction to Parallel Scientific Computations," *Postgraduate Studies in Supercomputing*, ed. FNRS/NFWO, Université de Liège, Belgium (1991)
22. C. Farhat, "Finite Element Analysis on Concurrent Machines," *Parallel Processing in Computational Mechanics*, ed. H. Adeli, Marcel Dekker, Inc., New York, pp. 183-218 (1991)

Refereed Journals

1. S. Petersen, C. Farhat and R. Tezaur, "A Space-Time Discontinuous Galerkin Method for the Solution of the Wave Equation in the Time-Domain," *International Journal for Numerical Methods in Engineering, (submitted for publication)*
2. D. Amsallem and C. Farhat, "An Interpolation Method for the Adaptation of Reduced-Order Models to Parameter Changes and Its Application to Aeroelasticity," *AIAA Journal, (submitted for publication)*
3. C. Farhat, A. Rallu and S. Shankaran, "A Higher-Order Generalized Ghost Fluid Method for the Poor for the Three-Dimensional Two-Phase Flow Computation of Underwater Explosions and Implosions," *Journal of Computational Physics, (submitted for publication)*
4. C. Bou-Mosleh and C. Farhat, "A Hybrid Analytical/Experimental Ground Methodology for Reproducing In-Flight Loads," *AIAA Journal, (submitted for publication)*
5. D. Ghosh and C. Farhat, "Strain and stress computations in stochastic finite element methods," *International Journal for Numerical Methods in Engineering, (in press)*
6. R. Tezaur, L. Zhang and C. Farhat, "A Discontinuous Enrichment Method for Capturing Evanescent Waves in Multiscale Fluid and Fluid/Solid Problems," *Computer Methods in Applied Mechanics and Engineering, (in press)*
7. K. Maute, C. Farhat, B. Argrow and M. Nikbay, "Sonic Boom Mitigation via Shape Optimization using an Adjoint Method and Application to a Supersonic Fighter Aircraft," *La Revue Européenne des Eléments Finis*, Vol. 17, pp. XXX-XXX (2008)
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