DESIGN LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY
305 MEMORIAL DRIVE, 412C • CAMBRIDGE, MA-02139
PHONE (857) 928-2186 • E-MAIL harishm@mit.edu • URL http://web.mit.edu/harishm/www/

HARISH MUKUNDAN

EDUCATION

Jan 2005 – Present	**Massachusetts Institute of Technology, Cambridge, MA**	*GPA 4.8/5.0*

Candidate for Doctor of Philosophy in Computer Aided Design.

Candidate for Master of Science in Ocean Systems Management.

Sept 2002 - Feb 2004 Master of Science in Mechanical Engineering, February 2005.

Sept 2002 - Feb 2004 Master of Science in Ocean Engineering, February 2005.

Joint M.S. thesis entitled *Surface-Surface Intersection with Validated Error Bounds*.

Jan 2002 - April 2002 **Hochschule Bremen, Bremen, Germany**

Exchange Student completed my undergraduate thesis done in conjunction with local industry & Indian Institute of Technology, Madras.

July 1998 - July 2002	**Indian Institute of Technology, Madras (IIT-Madras), Chennai, India**	*GPA 9.2/10.0*

Bachelor of Technology in Ocean Engineering & Naval Architecture.

Minor in Computational Solid Mechanics.

EXPERIENCE

Massachusetts Institute of Technology, Cambridge, MA

Sept 2002 - Present Research Assistant, Design Laboratory

- Physics based similarity detection algorithms for CAD models: Currently working on similarity detection algorithms for CAD models based on its physical behavior (current research).

- Vortex induced vibration analysis of marine risers: Analyzed the motion of marine risers and developed criterion for its stationarity; Multi-modal decomposition of high mode number riser vibration to study the phenomenon of traveling waves.

- Surface-Surface intersection with validated error bounds: Used interval arithmetic methods and developed an algorithm to obtain validated solutions for the Surface-surface intersection problem.

Fall 2004 Teaching Assistant, Structural Mechanics (2.080J)

- Coordinated and prepared course material, and delivered recitations.

Jan 2002 - April 2002 **Macor Neptun GmbH, Bremen, Germany**

Intern, Standardization and Development Group

- Analyzed the structural strength of the rudder and hatch coaming of a ship using finite-element method and conducted a parametric study and presented methods to improve their design.

Nov 2000 - Dec 2000 **Dempo Ship Builders and Engineers Limited, Goa, India**

Intern, Design and Planning Department

- Analyzed the design of an ocean thermal energy conversion vessel and carried out the conceptual design of a fishing vessel made of fiber reinforced plastic.

AWARDS & HONOURS

- Received American Bureau of Shipping award for the best undergraduate academic record in Ocean Engineering and Naval Architecture major in 2002.

- Received Class Nippon Kaiji Kyokai award for my undergraduate thesis in 2002.

- Received Deutscher Akademischer Austausch Dienst scholarship in 2002, to complete undergraduate thesis at Germany.

- Topped All Kerala State Entrance Exam 1998, among 25,000 students from Kerala state in India.

- Topped Cochin University of Science and Technology Entrance Exam 1998, among 15,000 students from all over India.

- Ranked among top 2% of the candidates who appeared for the Joint Entrance Examination (JEE) 1998, for admission to IITs.

SKILLS

Language Skills	• Fluent in English, Hindi, Malayalam • Low-intermediate in German
Mathematical Skills	• Numerical Methods • Linear Algebra • Nonlinear ODEs • Interval Analysis
Computer Skills	• **Languages:** C, C++, HTML, Pascal. • **Packages:** Solid Works, Auto CAD, MATLAB, MS Office, LaTeX, GNU Plot, DBASE, NISA, ANSYS, Adobe Photoshop, Adobe Indesign. • **Operating Systems:** Linux, Solaris, AIX, Unix, Windows, DOS. • Maintained the web pages for the International Convention on Shapes and Solids 2005. • Computer administrator at the Department of Ocean Engineering, IIT-Madras.
Organizational Skills	• Involved in organizing committee of the MIT Sloan Leadership Conference 2005. • Involved in the publication of the monthly Graduate Student Magazine (GSN). • Participated in the MIT $50K Entrepreneurship Competition 2005. • Held organizational responsibilities for Graduate Student Council and Ashdown hall at MIT.

RELEVANT COURSEWORK

Graduate	**Massachusetts Institute of Technology, Cambridge, MA**
	Computational Methods: Numerical Methods of Applied Mathematics-I; Computational Geometry; Computer Methods in Dynamics.
	Dynamics: Structural Mechanics; Dynamics; Advanced Structural Dynamics; Marine Hydrodynamics.
	Engineering Systems Design & Management: System Design and Analysis based on AD and Complexity Theories; Design Principles for Ocean Vehicles; Transportation Systems; Management of Marine Systems; Strategic Management.
	Economics & Finance: Economics of Marine Transportation Industries; Finance Theory I; Finance Theory II.
	Mathematics: Mathematical Methods for Engineers I; Probability and Statistics in Engineering; Advanced Partial Differential Equations with Applications.
Undergraduate	**Indian Institute of Technology, Madras, Chennai, India**
	Design: Industrial Design; Ship Design; Offshore Structural Design; Computer Aided Design; Computer Aided Ship Design and Drafting I; Computer Aided Ship Design and Drafting II.
	Computational Methods: Approximate Methods in Engineering; Applied Finite Element Methods; Finite Element Applied to Ocean Engineering.

MAJOR PUBLICATIONS

- Surface to Surface Intersections, N. M. Patrikalakis, T. Maekawa, K. H. Ko, and H. Mukundan. Computer-Aided Design and Applications, Vol. 1, No. 1-4, pp. 449-458, 2004.

- Intersections With Validated Error Bounds For Building Interval Solid Models, Mukundan, H., Ko, K. H. and Patrikalakis, N. M., ASME 25th Computers and Information in Engineering Conference (CIE), Long Beach, California, USA, September 2005.

- DNS-based Multi-Modal Decomposition of VIV, Lucor, D., Mukundan, H., and Triantafyllou, M., Fourth Conference on Bluff Body Wakes and Vortex Induced Vibrations (BBVIV4), Santorini, Greece, June 2005.

- Tracing Surface Intersections with a Validated ODE System Solver, Mukundan, H., Ko, K. H., Maekawa, T., Sakkalis, T., and Patrikalakis, N. M., Proceedings of the Ninth EG/ACM Symposium on Solid Modeling and Applications, Elber, G. and Taubin, G. editors. Genoa, Italy, Eurographics Press, June 2004.