

# HEENA MUTHA

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## RESEARCH INTERESTS

My research interests are in sustainable energy, especially wind and offshore technologies. These interests include emissions reduction, complex flow, ocean structures, dynamics testing, controls refinement, component design, and power storage.

## EDUCATION

### Franklin W. Olin College of Engineering-Needham, MA

May 2010

- Candidate for Bachelor of Science in Mechanical Engineering GPA: 3.84/4.00
- Relevant Coursework: Mechanical Design, Dynamics, Renewable Energy Systems, Thermodynamics, Transport Phenomena (Fluids, Heat and Mass Transfer), Mechanics of Solids and Structures, Nonlinear Dynamics and Chaos, Materials Science, Computational Modeling, Modeling and Controls

## RESEARCH EXPERIENCE

### DOE Summer Undergraduate Laboratory Intern (SULI), Modal Testing of Research Turbine<sup>1,2</sup> Jun 09-Aug 09

National Renewable Energy Laboratory. Mentor: Richard Osgood

- Conducted a full modal test on a 600 kW Siemens wind turbine to refine an NREL controls model
- Developed an LMS Test.Lab model to characterize the modes (resonances, damping, and shapes)
- Utilized both hydraulic shaker and novel wind excitation methods to obtain modes from turbine
- Compared experimental and model modes finding <5% difference between several fundamental modes

### Project Manager, Expanding Platform Applications for Microfluidics

Sep 09- Present

Senior Capstone Program in Engineering (SCOPE). Olin College. Sponsored by NSF and Brandeis University

- Continuing development of microfluidics research imaging platform from previous SCOPE project
- Prioritizing goals of 7-person interdisciplinary team comprised of mechanical, bio., and systems engineers
- Designing pressure-based flow and emulsion mixer systems to facilitate microfluidics research

### Research Student, Effects of Tumor Suppressor, RASSF1A, on Transcription

Sep 06 – Dec 07

Olin College. Mentor: Dr. Joanne Pratt

- Planned investigation with mentor and independently developed work plan to meet project goals
- Presented findings to the Olin community through a final oral presentation and written technical report

## PUBLICATIONS AND CONFERENCE PROCEEDINGS

<sup>1</sup>R. Osgood, G. Bir, **H. Mutha**, B. Peeters, et al. "Full-scale modal wind turbine tests: comparing shaker excitation with wind excitation". Paper to be presented at the 28th International Modal Analysis Conference, Jacksonville, FL, Feb. 1-4, 2010.

<sup>2</sup>**H. Mutha** and R.Osgood. "Full-Scale Wind Turbine Modal Testing: Hydraulic Shaker and Wind Excitation". AWEA WINDPOWER 2010 Conference, Dallas, TX, May 23-26, 2010. *Abstract under review.*

## LEADERSHIP AND ACTIVITIES

### Engineering Discovery, Olin College- Program Coordinator

May 06-Present

- Started a service program for Olin undergraduates to teach engineering to elementary school children
- Lead 15 Olin students in hands-on curriculum development and organized several school programs

### Introductory Courses Assistant, Olin College

Sep 07-Dec 08

- Tutored first-year students in single-variable calculus and reviewed homework assignments
- Facilitated Modern Biology lab by overseeing experiments and answering questions

## SKILLS

**Machine Shop:** Mill, lathe, drill press, precision saw, vertical and horizontal band saws, belt sander, dremel

**Lab:** Wind tunnel, Instron, X-ray diffraction, thermomechanical analyzer, differential scanning calorimeter

**Computer:** SolidWorks, COMSOL, ANSYS, MATLAB, Python, LMS Test.Lab