

# SUREKHA GUNASEKARAN

Rm. 3-137, M.I.T., 77 Mass. Ave. · Cambridge, MA 02139 · (217) 418-7936 · surekhag@mit.edu

## EDUCATION

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**Massachusetts Institute of Technology (MIT), Cambridge, MA**  
Candidate for Master of Science in Mechanical Engineering (SMME)

May 2013  
**GPA 5.0/5.0**

**Indian Institute of Technology Madras (IITM), Chennai, India**  
Bachelor of Technology in Mechanical Engineering, Minor in Operations Research. Class Rank: 3

July 2010  
**GPA 8.82/10.00**

## EXPERIENCE

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**Center for Clean Water and Clean Energy, MIT**  
*Graduate Research Assistant*

Cambridge, MA  
September 2011 - Present

- Designed a multi-compartment reactive ion transport membrane technology for carbon capture and sequestration
- Optimized an advanced zero emission cycle (AZEP) resulting in a 4.3% increase in its efficiency
- Analyzing the efficiency of a solar-hybridized AZEP plant design using parabolic trough collectors

**Refrigeration & Air Conditioning Lab, IITM**  
*Undergraduate Research Assistant*

Chennai, India  
April 2010 - May 2011

- Developed an entropy-based method for drawing complex phase envelopes
- Added three-phase capabilities to REFPROP, a program developed by National Institute of Standards Technology

**FLSmidth Inc.**  
*Summer Intern*

Chennai, India  
May-July 2010

- Redesigned the outlet sector of the kiln in a cement-producing plant to optimize manufacturing and operational costs
- Achieved a 14% reduction in the frequency of routine maintenance down-time using structural and thermal analysis in ANSYS

**Indian Institute of Management Bangalore**  
*Summer Intern*

Bengaluru, India  
May-July 2009

- Analyzed risk allocation in public-private partnerships through a case study of privatization of Pipapav Port
- Prepared a report on risk analysis and consequences of privatization of Bangalore International Airport Limited

## CONFERENCES & PUBLICATIONS

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1. A Multi-Compartment Ion-Transport-Membrane Reactive Oxygen Separator. *Ind. Eng. Chem. Res.*, 2012, **51**(23), pp. 7988-7997
2. Design and Optimization of ITM Oxy-Combustion Power Plants. *ECOS 2012*, June 26-29, 2012, Perugia, Italy
3. An Entropy-Based Approach for Drawing Complex Vapour-Liquid Envelopes. *Fluid Phase Equilib.* (submitted)
4. Optimal Design of ITM Oxy-Combustion Power Plants. *ASME IMECE*, November 9-15, 2012, Houston, TX (selected)

## LEADERSHIP

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**Executive Member, MIT VentureShips Club**

2012-2013

- Conducted events to connect start-ups with students at MIT resulting in a 100% increase in student participation
- Managed the interview process and overseeing the post-recruitment performance of about 150 students to 4 start-ups

**Event Coordinator, Center for Clean Water and Clean Energy, MIT**

2011-2013

- Organized workshops to enhance collaborative research between MIT and King Fahd University of Petroleum and Minerals
- Participated in the Inter-University Student Initiative in Carbon Sequestration, Princeton University, November 2011

**Technical Affairs Secretary, IITM**

2009-2010

- Trained 500 students through Robotics workshops, and finished second in a competition from a history of last place finishes
- Led a 40-member team that finished fourth among 50 in a national competition for designing a 128-step Rube Goldberg machine

## SKILLS

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- **Software:** MATLAB, ASPEN Plus, AutoCAD, SolidWorks, JACOBIAN, ProEngineer, ANSYS, LabVIEW, Fortran, C/C++
- **Courses:** Advanced Heat and Mass Transfer, Fundamentals of Advanced Energy Conversion, Fundamentals and Applications of Combustion, Microeconomic Theory and Public Policy, Computational Science and Engineering I, General Thermodynamics
- **Course Projects:** The Effect of Gas Leakage in a Power Plant Integrated with Chemical-Looping Combustion for Carbon Dioxide Capture. One-Particle Simulation of Solid Biomass Combustion. Nano-Particle Model for Temperature Distribution of Drugs.

## HONORS & ACHIEVEMENTS

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Best Innovative Design of the Year from Rural Technology Action Group (2008) ♦ Winners of GF & KR Basketball Tournament (2007)  
♦ Top 10% in Regional Mathematical Olympiad, India 2005 ♦ School Captain & Best All-Rounder in Class XII, 2005-2006

## ACTIVITIES

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MIT Energy Club, ASME Student Member, Kayaking, IITM Women's Basketball Team, National Cadet Corps of India