

**VISHAL MAHINDRAKAR**  
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## EDUCATION

**Ph.D., Chemical Engineering**, GPA: 3.9/4 Expected: Dec 2014  
*Rensselaer Polytechnic Institute*, Troy, NY  
Transferred from *Texas A&M University*, College Station, TX (Sept 2010 - Aug 2012)

**Bachelor of Technology, Chemical Engineering**, GPA: 8.35 / 10 May 2008  
*Indian Institute of Technology Madras (IIT Madras)*, Chennai, India

## RESEARCH EXPERIENCE

***Rensselaer Polytechnic Institute, Troy, NY*** (Aug 2012 – Present)  
**Dynamics and Control of Benzene Hydrogenation via Reactive Distillation**  
Adviser: *Dr. Juergen Hahn*

- Developed a first principles-based dynamic model for reactive distillation column involving over 2400 differential and over 5000 algebraic equations using gPROMS.
- Developed feedback control and feedforward control structures for the reactive distillation column.
- Developed model predictive control (MPC) for the rigorous model to minimize disturbance effects for the column.

***Texas A&M University, College Station, TX*** (Sept 2010 - Aug 2012)  
**Control of Pilot plant for Fischer Tropsch Synthesis in Supercritical Fluid Phase**  
Adviser: *Dr. Juergen Hahn*; Collaborator: *Dr. Nimir Elbashir, Texas A&M University at Qatar*

- Worked with Dr. Elbashir's research group to help identify the design controlled and manipulated variables for pilot plant setup in Qatar.

## INDUSTRIAL EXPERIENCE

***ExxonMobil Research and Engineering, Baytown, TX*** (May 2014 – Aug 2014)  
Summer Internship, Advanced Control Section, Automation & Process Control Division

- **Platform Technology Evaluation**

Evaluated potential software platform for modeling, control, and optimization applications.

Developed dynamic model for a polymerization process, performed parameter estimation, and configured a nonlinear model predictive controller (MPC).

***Reliance Industries Limited (RIL), Jamnagar, Gujarat, India*** (June 2008 – July 2010)  
Manager, Special Task Force

- **ASPEN Flarenet Modeling**

Led a team of 4 members to build and validate Flarenet models for refinery flare network.

Linked individual plant models to create a single master model with the help of visual basic, improving overall execution time and accuracy.

- **Estimation of Relief Loads**

Estimated relief loads of polypropylene unit expected during an emergency flare relief scenario by analyzing process control system and electrical configuration of the unit in accordance with API guidelines.

- **Propylene Purification**

Tested the efficiency of low temperature shift reaction catalyst experimentally to remove odor from polypropylene pellets caused due to presence of traces of sulfur.

- **Plant Hydraulics**

Validated performance and checked the adequacy of pumps for various fluid systems in the refinery by rigorously analyzing the pressure losses in piping loops.

**Sterlite Optical Technologies Limited, Aurangabad, India**

(May 2007-July 2007)

Internship

- **Production of Silicon Tetrachloride (SiCl<sub>4</sub>) from Silicon Dioxide (SiO<sub>2</sub>)**

Modified an existing chemical vapor deposition reactor to create an experimental setup for producing SiCl<sub>4</sub> on lab scale. Conducted experiments at temperature range of 1000°C to 1700°C for different reactant compositions.

## **PUBLICATIONS**

V. Mahindrakar and J. Hahn. Dynamics and Control of Benzene Hydrogenation via Reactive Distillation. *Journal of Process Control* **24**, No. 3, pp. 113-124 (2014)

## **CONFERENCE PRESENTATIONS**

V. Mahindrakar and J. Hahn. Evaluating Control Techniques for Benzene Hydrogenation via Reactive Distillation. *APMF 2014: The Advanced Process Modeling Forum, New York, NY* (2014)

V. Mahindrakar and J. Hahn. Model Predictive Control of Reactive Distillation Column for Benzene Hydrogenation. *AIChE 2014 Annual Meeting, Atlanta, Georgia* (2014)

V. Mahindrakar and J. Hahn. Dynamics and Control of Benzene Hydrogenation via Reactive Distillation. *AIChE 2014 Process Development Symposium, Philadelphia, PA* (2014) **Invited Presentation**

V. Mahindrakar, W. Dai and J. Hahn. Modeling, Control and Optimization of Dynamic Processes. *Advanced Manufacturing Conference, Troy, NY* (2014)

V. Mahindrakar and J. Hahn. Dynamics and Control of Benzene Hydrogenation via Reactive Distillation. *AIChE 2013 Annual Meeting, San Francisco, California* (2013)

V. Mahindrakar and J. Hahn. Dynamics and Control of Benzene Hydrogenation via Reactive Distillation. *APMF 2013: The Advanced Process Modeling Forum, New York, NY* (2013)

## **SKILLS**

gPROMS, MATLAB, CHEMCAD, Aspen Flarenet, Aspen Plus, PIPENET, MS Office