Indu Venu Sabaraya

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Education

Doctor of Philosophy, Environmental and Water Resources Engineering — **Expected May 2019**
The University of Texas at Austin

Master of Science, Environmental and Water Resources Engineering — **May 2016**
The University of Texas at Austin — *Overall GPA: 3.71/4.00*

Bachelor of Engineering, Chemical Engineering — **May 2014**
Rashtreeya Vidyalaya College of Engineering (RVCE), Bangalore, India — *Overall GPA: 9.12/10.00*

Technical Highlights

- Strong background in synthesis and characterization of metal/metal oxide nanomaterials and metal/metal oxide-carbon nanotube nanohybrids
- Active participation in collaborative multidisciplinary research including Transportation Engineering, Biophysics, Nanomaterial Science and Chemical Engineering

Experience

Graduate Research Assistant, Advisor: Dr. Navid Saleh — August, 2015 - Present

- *Hybrid Synthesis and Photo-transformation*: Assisted in developing a simple, novel method for conjugating metal oxide nanoparticles with multiwalled carbon nanotubes (MWNTs) for synthesizing multifunctional nanohybrids used in electro-catalysis and environmental applications; Developed protocols for characterizing the nanohybrids and studying their environmental fate and transport; Assessed photo-transformation of the nanohybrids under visible and UV irradiation by utilizing an array of material characterization tools
- *Biofilm-Carbon Nanotube Interaction:* Developed protocol to assess changes in viscoelastic moduli when *Pseudomonas aeruginosa* biofilms interact with oxidized MWNTs; Assessed aggregation of *P.aeruginosa* cells in the presence of MWNTs using flow cytometry and cryo-transmission electron microscopy (cryo-TEM)
- *Nanomaterial-Asphalt Interaction:* Investigated the dispersion characteristics of typical nano-materials in surrogate solvents representing a physico-chemical environment similar to that of asphalt binders; Studied correlation between performance characteristics of asphalt binders and retention of nanoscale identity in surrogate solvents
- *Virus-Carbon Nanotube Interaction:* Designed protocols to visualize interaction of MS2 virus and MWNTs utilizing cryo-TEM; Investigated mechanisms of such interaction by studying the virus capsid chemistry and MWNT surface functional groups
- *Fate and Transport of Gold Nanorods:* Outlined experimental design to capture the transport characteristics of gold nanospheres and gold nanorods through column studies

Instructor, General Engineering — Spring 2015, Fall 2017

- Designed curriculum and lectures to teach supplementary engineering courses for Physics and Chemistry to freshmen engineering students

Teaching Assistant, Civil Engineering — Fall 2014, Spring 2016, Spring 2017

- *Introduction to Computer Methods (Fall 2014):* Facilitated laboratory learning sessions in FORTRAN and MATLAB with Dr. Howard Liljestrand
- *Nanotechnology Laboratory (Spring 2016):* Prepared laboratory protocols for nanomaterial synthesis, fate and transport and toxicity experiments; facilitated laboratory sessions for Dr. Mary Jo Kirisits and Dr. Navid Saleh
- *Introduction to Environmental Engineering (Spring 2017):* Facilitated laboratory learning project in eyewash station water sampling and grading assignments for Dr. Navid Saleh

Research Assistant, Advisor: Dr. C. Vidya and Shilpa Hiremath 12/2013-05/2014

- *Photocatalytic Degradation of Textile Dyes in Effluent Streams:* Investigated photocatalytic degradation efficiency of synthesized zinc oxide {ZnO) nanoparticles in degradation of textile dyes

Research Assistant, Advisor: Dr. C. Vidya and Shilpa Hiremath 1/2013-05/2013

- *Green synthesis of ZnO nanoparticles using Calotropis gigantea:* Utilized knowledge of surface chemistry principles to design a green synthesis route for facile, large scale production of ZnO nanoparticles; Mentored sophomore students to optimize synthesis routes; Conference proceeding published in International Journal of Current Engineering and Technology, INPRESSCO in September 2013

Trainee, National Thermal Power Corporation (NTPC), Noida, India May 2011, May 2013

- Studied coal-fired power generation process and power plant designs, reviewed policies governing effluent treatment strategies and thermal waste management

Analytical Characterization Technique Expertise

- Transmission Electron Microscopy
- Cryogenic Transmission Electron Microscopy
- Scanning Electron Microscopy
- Atomic Force Microscopy
- Raman Spectroscopy
- Fourier Transform Infrared Spectroscopy
- Energy Dispersive Spectroscopy
- X-ray Photoelectron Spectroscopy
- Thermo-gravimetric Analysis
- Electrokinetic measurements
- UV/Visible spectroscopy
- Inductively Coupled Plasma – Optical Emission Spectroscopy
- Static and Dynamic Light Scattering

Leadership

- *Mentor to Manjula Andukuri:* Studying fate and transport of gold nanoparticles: Effect of gold nanoparticle geometry, Summer 2017
- *Mentor to Erica Mason:* Studied photocatalytic effectiveness of Pickering emulsions with titanium dioxide conjugated with MWNTs in organic dye degradation; Awarded Undergraduate Research Fellowship of $1000 in Fall 2016
- *Member, EWRE Seminar Committee*: Nominated by peers to organize weekly seminars for the environmental engineering department in Fall 2016 and Spring 2017
- *Senior Manager, Sponsorship Committee:* Organized teams for acquiring corporate sponsorships for the Golden Jubilee edition of 8th Mile, the annual techno-cultural festival of RVCE

Accomplishments

- Recipient, Cockrell School of Engineering Fellowship, 2016
- Nominated for and attended Global Young Leaders Conference (GYLC) in Washington D.C. and New York in 2010
- Recipient, Times NIE Student of the Year Award, 2008

Skills

- Fluent in English, Hindi, Malayalam, Tulu
- Computer programming languages: MATLAB, R, SAS, C/C++
- Basic proficiency in ASPEN HYSYS and Star CCM+
- Grade 4 Guitarist certified by Rockschool Limited, UK