Sachin Jadhao
sj858@cornell.edu | +1-(607)3398937 | Ithaca, NY | linkedin.com/in/sachin-j-318563330

## ABOUT ME

Dynamic sustainability researcher with expertise in environmental life cycle assessment (LCA), Techno Economic analysis (TEA) and industrial ecology, demonstrated through research at Cornell University and IIT Bombay. Specialized in evaluating environmental performance of chemical process, agricultural systems and sustainable aviation fuel pathways, with strong capabilities in exergy analysis and resource utilization assessment. Proven track record in conducting comprehensive sustainability studies, publishing in peer-reviewed journals, and developing innovative solutions for waste-to-value processes. Proficient in process development, technology scale-up, and environmental compliance, supported by strong technical skills in ASPEN Plus and OpenLCA. Experience spans multiple sectors including controlled environment agriculture, aviation fuels, and industrial waste management

## WORK EXPERIENCE

21/08/2024 – Present

### GRADUATE RESEARCH ASSISTANT CORNELL UNIVERSITY, ITHACA, U.S.A

- Performed comprehensive Life Cycle Assessment (LCA) of urban agriculture systems, focusing on Controlled Environment Agriculture (CEA) technologies for lettuce production.
- Evaluated the environmental impacts across the complete supply chain for New York City's lettuce production.
- Conducted comparative assessment of multiple CEA technologies to identify sustainable production alternatives.
- Performed environmental hotspot analysis to identify critical intervention points for sustainability improvements
- Quantified net carbon benefits and environmental trade-offs of CEA implementation in urban food systems

01/02/2024 – 31/05/2024 Mumbai, India

### SENIOR PROJECT RESEARCH SCIENTIST INDIAN INSTITUTE OF TECHNOLOGY (IIT) BOMBAY

- Perform Preliminary techno-economic assessment (TEA) for the selected Sustainable Aviation Fuel.
- Conducted research on evaluation of alternative pathways of Sustainable Aviation Fuel (SAF) in India, focusing on Fischer-Tropsch Synthesis using captured CO2 and green hydrogen
- Used Life Cycle Assessment (LCA) and Techno-Economic Assessment (TEA) for evalustion of alternative pathways of SAF production technologies aligned with ASTM International standards.
- Developed analytical frameworks to evaluate environmental and economic feasibility of SAF implementation at national scale
- Identified and analyzed critical hotspots across the SAF production lifecycle, from feedstock acquisition to final fuel production

01/04/2022 – 31/01/2024 Pune, India

### LAB HEAD SHREEJI AQUA TREATMENT PVT. LTD.

- Head operations of the National Accreditation Board for Testing and Calibration Laboratories (NABL) & The Ministry of Environment, Forest and Climate Change (MoEFCC) accredited analytical laboratory.
- We provided consultancy services for all environment-related work, like environmental monitoring, environmental site assessment, environmental audits for industries, and meeting environmental compliance requirements.

01/007/2020 – 31/12/2023 Pune, India

### SENIOR PROJECT ENGINEER CHEMENGG RESEARCH PVT. LTD.

- Led multiple R&D projects from conceptualization, laboratory scale product and process development, process finalization, process optimization to pilot-scale implementation, focusing on sustainable chemical process development and waste valorization
- Designed and optimized innovative chemical processes including continuous flow reactions and selective separation technologies
- Developed scalable processes for industrial waste recovery and value-added product manufacturing
- Managed end-to-end project lifecycle including feasibility studies, process design, and economic evaluations

**Technical Achievements:**
Successfully developed processes for:
- Recovery and purification of hydrochloric acid from industrial waste streams
- Manufacturing of Sodium permanganate (NaMnO4)
- Continuous flow synthesis of 3-nitro-benzaldehyde with enhanced efficiency
- Novel separation technology for nitro-benzaldehyde isomers
- Eco-friendly concrete admixtures from Kraft lignin
- Economic recovery of sodium sulfate from industrial effluents

**Engineering & Operations:**
- Executed comprehensive process engineering calculations, including mass/energy balances and equipment sizing
- Developed detailed process flow diagrams (PFD) and P&IDs for pilot plant operations

• Supervised laboratory and pilot plant experiments, ensuring data accuracy and reproducibility
• Conducted technical and economic feasibility studies, including CAPEX/OPEX analysis
• Managed research facilities and laboratory resources, optimizing operational efficiency

21/09/2021 – 31/12/2023 Pune, India

### SENIOR PROJECT ENGINEER NUTRIVMS BIOCHEM PVT. LTD.

• Lead new product & process development at Laboratory scale & Technology Development.
• Basic engineering Calculation, Mass Balance, Energy Balance Equipment sizing, CAPEX & OPEX, PFD & P&ID.
• Developed a process for recovery of keratin protein and amino acids from waste chicken feathers and conversion into value-added products such as liquid amino acid fertilizer.
• Recovery of keratin hydrolysate (water soluble) derived from chicken feathers using an enzymatic hydrolysis.

03/07/2017 – 30/06/2020 Mumbai, India

### POST DOCTORAL FELLOW INDIAN INSTITUTE OF TECHNOLOGY (IIT) BOMBAY

• Co-pyrolysis studies on the interaction of mixed plastics waste using spent FCC
• Developed a continuous process for plastic pyrolysis of mixture of waste plastics (HDPE, LDPE, PP, and PS).
• Experimentally investigated the effect of the interaction plastic components on the yields and quality of Oil.
• Scaled up the Process from a laboratory scale to a process that can handle 10 kg/h of feed.
• Tata Research Canter funded this project; it is part of integrated waste management for the IITB campus using various technologies such as plastic pyrolysis, biomass gasification, composting, etc.

09/02/2015 – 30/06/2017 Goa, India

### SENIOR TECHNOLOGY ARCHITECT GEIST RESEARCH PRIVATE LIMITED

• Developed a continuous process for high-strength, stable bleaching powder.
• Developed a Process for the recovery of valuable chemicals from Industrial effluents.

01/09/2006 – 30/07/2007 Ankleshwar, India

### CHEMICAL ENGINEER GUJARAT ORGANICS LIMITED

• Handling the production & technology transfer activities
• Manufacturing of para hydroxyl benzoic acid

## EDUCATION AND TRAINING

18/08/2009 – 21/10/2015 Mumbai, India

**PH.D.** Institute of Chemical Technology (ICT), Mumbai

**Website** https://www.ictmumbai.edu.in/

16/08/2007 – 30/06/2009 Mumbai, India

**M.CHEM.ENGG.** Institute of Chemical Technology (ICT), Mumbai

**Website** https://www.ictmumbai.edu.in/

06/07/2000 – 08/07/2005 Chikhali

**B-TECH IN CHEMICAL ENGINEERING** Anuradha Engineering College, Chikhli

**Website** https://aecc.ac.in/

## LANGUAGE SKILLS

- Marathi, Hindi, English

## RESEARCH INTEREST

- Sustainability Assessment, Technology development, Circular Economy, Industrial Symbiosis, and Industrial Ecology.
- Electro Fuels (E-Fuel), E-Methanol, Sustainable Aviation Fuel, carbon capture, Green Hydrogen.
- Exergy analysis. Resource efficiency, Energy efficacy. Life cycle assessment (LCA)
- Municipal solid waste management, recovery of value from waste.
- Environmental Footprints: Water Footprint, Carbon Footprint, Land Footprint, Ecological Footprint, etc., Environmentally-extended input-output models, Accounting for Ecosystems services

## PUBLICATIONS

### JOURNAL PUBLICATIONS


- Jadhao, S.B., Pandit, A.B., Bakshi, B.R. Resource Utilization and Destruction in Indian Industrial Sectors: An Exergy Analysis, Industrial and Engineering Chemistry, 2019, 58, 26, 11566-11575 https://pubs.acs.org/doi/10.1021/acs.iecr.8b06131
- Jadhao, S.B., Pandit, A.B., Bakshi, B.R. The evolving metabolism of a developing economy: India's exergy flows over four decades. Applied Energy, Volume 206, 15 November 2017, Pages 851–857. http://www.sciencedirect.com/science/article/pii/S0306261917312308

- Jadhao, S.B., Pandit, A.B., Bakshi, B.R. Gasify, Burn, or Bury: Assessing Municipal SolidWaste Management Options in Indian Megacities by Exergy Analysis. Clean Technologies and Environmental Policy. July 2017, Volume 19, Issue 5, pp 1403-1412http://www.sciencedirect.com/science/article/pii/S0306261917312308
- Patwardhan. AW; Mali. R. G.; Jadhao. S. B., Bhor. K. D., Padmakumar. G., Vaidyanathan. G." Argon entrainment into liquid sodium in a fast breeder reactor. Nuclear Engineering and Design, Vol. 249, August 2012, Pages 204-211 https://www.sciencedirect.com/science/article/pii/S0029549311006224
- D'Sa, S.M., Patnaik, D., Acham, V., Jadhao S. Correspondence between Technology Options Available for Chemical Industries and the Levels of the Waste Management Hierarchy: A Case Study Approach. Nature Environment and Pollution Technology, 2021, 20(4), pp. 1733–1740 https://www.researchgate.net/publication/356857259_Correspondence_Between_Technology_Options_Available_for_Chemical_Industries_and_the_Levels_of_the_Waste_Management_Hierarchy_A_Case_Study_Approach

**CONFERENCE PUBLICATIONS**

- Pyrolysis of mixed plastic waste, S B Jadhao and S Seethamraju, 2020 IOP Conference Series: Materials Science and Engineering, Volume 736, 042036, **DOI** 10.1088/1757-899X/736/4/042036 https://iopscience.iop.org/article/10.1088/1757-899X/736/4/042036
- Municipal Solid Waste to Useful Energy Conversion Options in India: Insights From Exergy Analysis.Jadhao, S.B., Pandit, S. Shinghade, Bakshi, B.R. 3rd International Congress on Sustainability Science and Engineering, ICOSSE 2013, 2013, pp. 476–492 Cincinnati, OH, USA http://icosse.org/2013/proceeding/paper/municipal-solid-waste-useful-energy-conversion-options-indiainsights-exergy-analysis-0-
- Challenges and opportunities for enhancing exergy efficiency of industrial sectors in developing economies -Insight from India's growth Jadhao, S.B., Pandit, A.B., Bakshi, B.R. 2012 AIChE Annual Meeting, Conference Proceeding, 2012. Pittsburgh, PA,USA. https://www.aiche.org/conferences/aiche-annual-meeting/2012/proceeding/paper/630g-challenges-andopportunities enhancing-exergy-efficiency-industrial-sectors-developing
- The evolving metabolism of a developing economy - Insight from India's growth, Jadhao, S.B., Bakshi, B.R., Pandit, A.B., IEEE International Symposium on Sustainable Systems and Technology, 2012. Boston, Massachusetts, USA http://ieeexplore.ieee.org/abstract/document/6228004/

**PATENTS**

- We have filed an Indian Patent for the "Process of extracting keratin protein from waste chicken feathers.

## DIGITAL SKILLS

- ASPEN Plus Process simulation software, Open LCA,
- Microsoft: Microsoft Word, Microsoft PowerPoint,
- Zoho Project, Zoho CRM

## CONFERENCES & PRESENTATIONS

- Jadhao S. B., Srinivas S., Feedstock Recycling of mixed plastics waste. International Symposium on Sustainable Systems and Technology Pittsburgh, PA, USA,2019. On 25-27 June 2019, in Portland, USA.
- Jadhao, S.B., Pandit, S. Shinghade, Bakshi, Municipal Solid Waste to Useful Energy Conversion Options in India: Insights From Exergy Analysis. BR International Congress on Sustainability Science Engineering. ICOSSE, 2013. Cincinnati, USA
- Jadhao, S.B., Pandit, A.B., Bakshi, B.R. Challenges and opportunities for enhancing exergy efficiency of industrial sectors in developing economies Insight from India's 2012 AIChE Annual Meeting, Conference Proceeding, 2012.Pittsburgh, USA.
- Jadhao, S.B., Bakshi, B.R., Pandit, A.B., The evolving metabolism of a developing economy - Insight from India's growth, IEEE International Symposium on Sustainable Systems and Technology, 2012. Boston, Massachusetts, USA.
- Jadhao, SB, National seminar on Environmental pollution and monitoring was organized by CKT, New Panvel, in 2011.
- Jadhao, S.B., National Level Paper Presentation at MS University Baroda (Gujarat).
- Participated in National Level Paper Presentation At JDIT Yavatmal.

## CONFERENCES ORGANIZING

- Organizing committee member for the International Symposium on Sustainable Systems and Technology, USA.
- Organizing committee member for Young Researchers Conference-09 UICT Mumbai

## TEACHING EXPERIANCE

- Teaching Assistant at Indian Institute of Technology Bombay, Mumbai, India,
  Subject: CL 665 (Sustainable Engineering Principles)
  Subject: CL433 Chemical Engineering Lab 4

## REFERENCES

- Bhavik R. Bakshi, Professor, The Ohio State University. bhavik.bakshi@asu.edu
- Aniruddha B. Pandit, Institute of Chemical Technology (ICT), Mumbai, India ab.pandit@ictmumbai.edu.in
- Prof. Srinivas Seethamraju, Department of Energy Science and Engineering, IIT Bombay, Mumbai s.srinivas@iitb.ac.in