Parmanand Maurya, Ph.D (Chemical Engineering)

|Process dynamics and Control| Mathematical Modeling | Sustainable Chemical Processes

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Research Profile Summary

Ph.D. in Chemical Engineering with over five years of research experience in dynamic modelling, simulation, and advanced control of nonlinear chemical and thermal process systems. Demonstrated expertise in temperature regulation, energy-efficient process operation, and system-level performance analysis using MATLAB, Simulink, and Python. Research contributions focus on the development and evaluation of advanced control methodologies with relevance to sustainable process operation, robustness enhancement, and energy optimisation in complex chemical systems.

Seeking a research-focused academic and Industrial position in Chemical processes with an emphasis on advanced process control, optimization, and the application of Machine Learning in chemical process systems.

Education

Ph.D. in Chemical Engineering

Indian Institute of Technology (BHU), Varanasi | **June 2025** CGPA: **8.20 / 10**
Thesis: *Advanced Controller Design for Temperature Control in Chemical Processes*
Focus Areas: Process Modeling, Advanced Process Control, Nonlinear Systems, Thermal Process Optimization

M.Tech in Chemical Engineering

Indian Institute of Technology (BHU), Varanasi | **June 2019** CGPA: **7.91 / 10**
Project: *Dynamics and Control of Liquid Level in Spherical and Annular Conical Tank Process*

B. Tech in Chemical Engineering

Meerut Institute of Engineering & Technology, Meerut | **June 2015** Percentage: **68.18%**
Project: *Production of Polystyrene: Optimisation and Cost Analysis*

Professional Experience

Junior / Senior Research Fellow – Chemical Engineering, *Indian Institute of Technology (BHU), Varanasi* | **July 2019 – June 2025**

- Developed dynamic mathematical models of chemical and thermal process systems, including reactors, mixing tanks, and heat exchangers.
- Designed and implemented advanced process control strategies to improve temperature stability, disturbance rejection, and operational robustness.

- Served as a Teaching Assistant in various Chemical Engineering laboratories, assisting in the operation of process equipment, experimental demonstrations, instrumentation handling, and student guidance.

Core Technical Expertise

- Process Modelling and Simulation of Chemical Systems
- Advanced Process Control and PID-based Strategies
- Nonlinear and Multivariable System Analysis
- Temperature and Energy-Intensive Process Control
- Process Optimisation and Performance Evaluation
- Sustainable and Efficient Chemical Process Operation

Technical Skills

- **Modelling & Simulation:** MATLAB, Simulink
- **Programming & Data Analysis:** Mechine Learning, Python
- **Control Systems:** PID, Fractional PID, Advanced and Robust Control Techniques
- **Optimisation:** Model-based tuning and system performance analysis
- **Reporting & Visualisation:** OriginLab, MS Excel, MS Office

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Selected Journal Publications

- **Maurya P.,** et al. *Modified Fractional-Order PID Structure for Bioreactor Control.* **The Canadian Journal of Chemical Engineering**, 102(9), 3173–3191.
- **Maurya P**., et al. *Modified Fractional-Order PID Controller Design for the Mixing Tank Process.* **Chemical Engineering & Technology**, 48(6).
- **Maurya P.,** et al. *Design of a Fractional-Order Sliding Mode Controller for an Unstable Three-State Model Jacketed CSTR.* **Asia-Pacific Journal of Chemical Engineering**, 20(3).
- Dasgupta R., **Maurya P.,** et al. *Hybrid MPC-PID control scheme for temperature control of Heat Exchanger.* **Sādhanā**
- Srivastav A., **Maurya P.,** et al. *Dynamics and Control of Liquid Level in Annular Conical Tank Process.* **Indian Journal of Science and Technology**, 12(8).

Conference Presentations

- Maurya P., & Singh R. S., "Fractional Order PID Controller Design for Mixing Tank Process," **IIChE CHEMCON 2023**, Heritage Institute of Technology, Kolkata, India, Poster Presentation, Dec. 2023.
- Maurya P., & Singh R. S., "Design of Fractional Order PID Controller for Three-State Model Jacketed CSTR," **ChEmference 2023**, BITS Pilani Goa Campus, India, Poster Presentation, Oct. 2023.

- Maurya P., & Singh, R. S., "Modified Fractional Order PID Controller Design for Mixing Tank Process," **SDCEE 2024,** Thapar Institute of Engineering and Technology, Patiala, India, Oral Presentation, Feb. 2024.
- Maurya P., & Singh R. S., "Design of Fractional Order HMPC Controller for Temperature Control in Solar Collector," **HSFEA 2023**, UPES Dehradun, India, Oral Presentation, Oct. 2023.
- Maurya P., & Singh R. S., "FO-SMC Controller Design for Unstable Three-State Model Jacketed CSTR," **FEMSSD 2025**, MMMUT Gorakhpur, India, Oral Presentation, Feb. 2025.
- Student Volunteer, **HES 2025,** International Conference on Hydrogen Energy and Sustainability.

References

Prof. Ram Sharan Singh
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Declaration: I hereby declare that the information furnished above is true and correct to the best of my knowledge.

Parmanand Maurya