YOGENDRA SHASTRI, Ph.D.

Department of Chemical Engineering,
Indian Institute of Technology Bombay
Room 311, Department of Chemical Engineering, IIT Bombay, Powai, Mumbai - 400 076.
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Education:

- **University of Illinois at Chicago** **Chicago, IL**
  Ph.D. in Bioengineering **2007**
  Dissertation: Sustainable system management

- **Indian Institute of Technology, Bombay[1]** **Mumbai, India**
  M.Tech. in Systems and Control Engineering **2003**
  Thesis: Nonlinearity measures of optimal static state feedback controllers

- **Laxminarayan Institute of Technology, Nagpur University** **Nagpur, India**
  B.Tech. in Chemical Engineering **2000**
  Thesis: Regeneration of Potassium Permanganate from pharmaceutical industry waste

Academic Employment:

- **Associate Professor** **Mumbai, India**
  Department of Chemical Engineering, Indian Institute of Technology, Bombay 05/2017 – to date

- **Assistant Professor** **Mumbai, India**
  Department of Chemical Engineering, Indian Institute of Technology, Bombay 07/2012 – 05/2017

- **Visiting Research Assistant Professor** **Urbana-Champaign, IL**
  Energy Biosciences Institute, University of Illinois 08/2010-06/2012

- **Post-doctoral research associate** **Urbana-Champaign, IL**
  Energy Biosciences Institute, University of Illinois 04/2008-07/2010

- **Research Scientist** **Clarendon Hills, IL**
  Vishwamitra Research Institute 07/2007-03/2008

Industrial Employment:

- **Optimal Decision Inc.** **Frisco, TX**
  Project intern 12/2005 - 03/2006

- **Tata Honeywell Limited** **Pune, India**
  Engineer (HI-SPEC Solutions Division) 07/2000 - 06/2001

Research interests:

- Sustainability and life cycle assessment
- Optimization
- Lignocellulosic and microalgal biofuels
- Municipal solid waste to energy

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[1] The M.Tech. thesis research was conducted at the Institute for Systems Theory in Engineering (IST), University of Stuttgart, as an exchange student through DAAD (German Academic Exchange Service) scholarship.

Teaching:

- **Department of Chemical Engineering, IIT Bombay**   **Mumbai, India**
    - CL603: Optimization (PG Elective)   Spring 2013-2016
    - CL665: Sustainable Engineering Principles (PG Elective)   Autumn 2015-2020
    - CL455: Design Lab I (UG Laboratory)   Autumn 2012-2020
    - CL459: Design Project (UG Laboratory)   Spring 2017-2019
    - CL233: Chemical Engineering Lab (UG Laboratory)   Spring 2014-2015
    - CL407: Process Equipment Design (UG Core)   Spring 2019-20201

- **University of Illinois**   **Chicago, IL**
    - Teaching Assistant: Introduction to Applied Optimization   Fall 2007
    - Advisor: Undergraduate Research   Spring 2008

- **University of Illinois**   **Urbana-Champaign, IL**
    - Guest speaker: Sustainable Biosystems Engineering   Fall 2009/2010

Research Grants:

- Title: Valorising waste from sugarcane and associated industries via innovations in pre-treatment, biotransformation and process intensification (vWa)
    - Sponsor: Innovate UK, Newton Fund (Indian Agency: Department of Science and Technology)
    - Duration: 2018-2021 (five years)
    - Amount: Multi-institution project
- Title: Optimization and control studies for the techno-economic feasibility of integrated biorefinery
    - Sponsor: Department of Biotechnology, Ministry of Science and Technology
    - Duration: 2015-2019 (five years)
    - Amount: Rs. 45,00,000
- Title: Stochastic life cycle impact assessment of lignocellulosic biofuels and its application to India
    - Sponsor: Department of Biotechnology, Ministry of Science and Technology
    - Duration: 2015-2019 (five years)
    - Amount: Rs. 36,00,000
- Title: Stochastic modeling and optimization of biochemical processing of lignocellulosic feedstock
    - Sponsor: Department of Science and Technology, Ministry of Science and Technology
    - Duration: 2013-2016 (three years)
    - Amount: Rs. 1984320
- Title: Concurrent Science, Engineering, and Technology for the Prevention of Postharvest Loss: Optimization Model Development and Analysis
    - Sponsor: University of Illinois at Urbana-Champaign, USA
    - Duration: 2013-2015 (two years)
    - Amount: Rs. 2158519
- Title: Sustainable bioenergy system design under uncertainty: Development of a novel analysis and decision support framework
    - Sponsor: Industrial Research and Consulting Center (IRCC), IIT Bombay
    - Duration: 2012-2015 (three years)
    - Amount: Rs. 2000000
- Title: Technology Package development for selected microalgae and post-harvest processing for biodiesel synthesis and dissemination (co-PI)
    - Sponsor: Department of Biotechnology, Ministry of Science and Technology

- – Duration: 2015-2019 (five years)
- – Amount: Rs. 60,00,000
- Title: Solid Waste Characterization and its Management in IITB Campus (co-PI)
    - – Sponsor: Tata Center for Technology and Design (TCTD)
    - – Duration: 2015-2017 (two years)
    - – Amount: Rs. 7,00,000

Awards and Honors:

- Winner of the AIChE Environmental Division graduate student paper competition: 2007
  Paper title: Sustainable mercury waste management using systems theory perspective

- Recipient of the DAAD (German Academic Exchange Service) scholarship: 2002-2003
  Scholarship is awarded to competitively selected M.Tech. candidates from the Indian Institute of Technology to conduct thesis research at a German university (selected for the University of Stuttgart)

- Recipient of the AIChE CAST (Computers and Systems Technology) Division travel award for AIChE annual meeting: 2007

- Certificate in Foundations of Teaching: 2011
  Center for Teaching Excellence, University of Illinois at Urbana-Champaign

- Prairie Project Sustainability Curriculum Program: 2011
  University of Illinois at Urbana-Champaign

CEP/QIP courses:

1. Sustainable Engineering to Address Food-Energy-Water Nexus: Five day QIP course conducted at IIT Bombay, December 2019, Course co-ordinator and co-instructor.
2. Energy from Waste: Sustainable Approaches. Six-day QIP course conducted at IIT Bombay, December 2018, Course co-ordinator and instructor.
3. Sustainable Engineering: Theory and Practice. Five-day QIP course conducted at IIT Bombay, December 2018, Course co-ordinator and instructor.
4. Sustainable Engineering: Theory and Practice. Five-day QIP course conducted at IIT Bombay, December 2017, Course co-ordinator and instructor.
5. Optimization in Design and Engineering. Three-day course under TEQUIP at the Government College of Engineering, Aurangabad, February 2017, instructor.
6. Optimization in Design and Engineering. Three-day course under TEQUIP at the R.V. College of Engineering, Bangaluru, March 2017, instructor.
7. Systems Approaches in Green Engineering. Five-day course under TEQUIP at the Shivaji University, Kolhapur, March 2017, instructor.
8. Sustainable Engineering: From Concepts to Design Solutions. Three-day CEP course conducted at IIT Bombay, August 2016, Course co-ordinator and instructor.
9. Sustainable Engineering: From Concepts to Design Solutions. Five-day QIP course conducted at IIT Bombay, August 2016, Course co-ordinator and instructor.
10. Optimization based improved decision making for business. Three-day CEP course conducted at IIT Bombay, February 2016, instructor.
11. Optimization in Design and Engineering. Five-day course under TEQUIP conducted at IIT Bombay, November 2015, instructor.

Continuing Education Lectures:

1. Heuristics optimization techniques. At the *Refresher course in Applied Mathematics and Statistic,* UGC Academic Staff College, University of Mumbai. Conducted at the Department of Mathematics, ICT Mumbai, December 2013.
2. Optimization methods. At the *Refresher course on Computational Methods in Basic Sciences*, UGC Human Resource Development Centre, University of Mumbai, conducted at the Department of Physics, University of Mumbai, November 2015
3. Optimization methods. At the *Refresher course on Mathematics and Statistics with theme "*Recent trends in Computational Mathematics & Statistics", UGC Human Resource Development Centre, University of Mumbai, conducted at the Department of Statistics, University of Mumbai, November 2016.
4. Life cycle assessment. At Short term QIP Course on "Green Concepts in Engineering and Chemistry", SVNIT, Surat. December 14, 2016.

Invited conference talks:

1. Process systems engineering for techno-economic feasibility of microalgal biofuels. Keynote talk at *PSE Asia 2016*, *7th International Symposium on Design, Operation and Control of Chemical Processes*, Tokyo (Japan), July 2016.
2. Effect of uncertainty and complexity on modeling in sustainability. At *TARDIS 2006: Trans-Atlantic Research and Development Interchange on Sustainability 2006, A scientific workshop*, YMCA of the Rockies, Estes Park, (USA), September 2006.

Invited talks:

1. Design for sustainability. At School of Design Thinking, Rajiv Gandhi Institute of Technology, Mumbai, November 2019.
2. Sustainability: A primer. At Thakur Institute of Management Studies, Career Development and Research, Mumbai, June 2019.
3. Sustainable engineering. At Shri Vile Parle Kelavani Mandal (SVKM) Narsee Monjee Institute of Management Studies (NMIMS), Mukesh Patel School of Technology Management and Engineering, Mumbai, February 2019.
4. Environment and sustainability. At Priyadarshani Institute of Engineering and Technology, Nagpur, December 2017.
5. Sustainable engineering: The way ahead. At College of Military Engineering, Pune, August 2017.
6. Sustainability assessment methods and their application to biofuel sector. At National Seminar on 'Sustainable Technologies for Specialty and Fine Chemicals' AISSMS College of Engineering, Pune, 2016.
7. Sustainable engineering: Concepts, challenges and design solutions. At *Department of Chemical Engineering, Visvesvaraya National Institute of Technology,* Nagpur (India), December 2015.
8. Techno-economic feasibility analysis of sustainable bioenergy feedstock production using optimization and simulation models. At *National Chemical Laboratory,* Pune (India), February 2011.
9. Systems approaches to biofuel sustainability. At *Department of Chemical Engineering, Visvesvaraya National Institute of Technology,* Nagpur (India), January 2011.
10. Is sustainability achievable? Exploring the limits of sustainability using model systems. At *Department of Bioengineering, University of Illinois at Chicago*, Chicago (USA), February 2008.
11. Sustainable mercury waste management: Industrial and ecological perspective. At *NEERI – National Environmental Engineering Research Institute*, Nagpur (India), July 2006.

Publications:

Journal Articles:

1. N. Hanumante, Y. Shastri, and A. Hoadley. Sustainability in a global circular economy: An integrated modeling perspective. Frontiers in Chemical Engineering, 2: 597474, 2020.

2. Pratik Gholkar, Y. Shastri, and Akshat Tanksale. Renewable hydrogen and methane production from microalgae: A techno-economic and life cycle assessment study. *Journal of Cleaner Production*. 279, 123726, 2020.

3. Riju De, Sharad Bhartiya and Y. Shastri. Constrained iterative learning control of batch transesterification process under uncertainty. *Control Engineering Practice*. 103, 104580, 2020.

4. Vinod Vijay Kumar, Andrew Hoadley, and Y. Shastri. A consequence analysis study of natural gas consumption in a developing country: Case of India. *Energy Policy*. 145, 111675, 2020.

5. Varun Punnathanam and Y. Shastri. Efficient optimization of a large-scale biorefinery system using a novel decomposition-based approach. *Chemical Engineering Research and Design*. 160: 175-189, 2020.

6. Vinod Vijay Kumar, Andrew Hoadley, and Y. Shastri. An outlook for dynamic impact assessment of resource depletion at the global level: Learnings from regional case studies. *Clean Technologies and Environmental Policy*. 22(4): 745-755, 2020

7. Riju De, Y. Shastri and Sharad Bhartiya. Parameter estimation and optimal control of a batch transesterification reactor: An experimental study. *Chemical Engineering Research and Design.* 157: 1-12, 2020.

8. Sumit Kumar Verma and Y. Shastri. Economic optimization of acid pretreatment: Structural changes and impact on enzymatic hydrolysis. *Industrial Crops & Products*. 147: 112236, 2020.

9. Fenila F. and Y. Shastri. Stochastic Optimization of enzymatic hydrolysis of lignocellulosic biomass. *Computers & Chemical Engineering*. 135: 106776, 2020.

10. Munagala Meghana and Y. Shastri. Sustainable Valorization of Sugar Industry Waste: Status, Opportunities, and Challenges. *Bioresource Technology*. 303: 122929, 2020.

11. Vibhuti Chhabra, K. Bambery, S. Bhattacharya & Y. Shastri. Thermal and in situ infrared analysis to characterise the slow pyrolysis of mixed municipal solid waste (MSW) and its components. *Renewable Energy*. 148: 388-401, 2020.

12. Arun Sreekumar, Y. Shastri, P. Wadekar, M. Patil, and A. Lali. Life Cycle Assessment of Ethanol Production in a Rice Straw Based Biorefinery in India. *Clean Technology and Environmental Policy*. 22: 409-422. 2020.

13. Govind Murali and Y. Shastri. Life cycle assessment-based comparison of different lignocellulosic ethanol production routes. *Biofuels*. Available online (10.1080/17597269.2019.1670465).

14. Sumit Kumar Verma and Y. Shastri. Deterministic and stochastic optimization of dilute acid pretreatment of sugarcane bagasse. *Biofuels*. Available online (10.1080/17597269.2018.1564600).

15. Ashish Soren and Y. Shastri. Resilient design of biomass to energy system considering uncertainty in biomass supply. *Computers & Chemical Engineering*. 131, 2019.

16. N. Hanumante, Y. Shastri, and A. Hoadley. Assessment of circular economy for global sustainability using an integrated model. *Resources, Conservation, & Recycling*. 151, 2019.

17. Tao Lin, Wei-Ting Liao, Luis F Rodriguez, Yogendra Shastri, Yangfeng Ouyang, M.E. Tumbleson, & K.C. Ting. Optimization modeling analysis of grain harvesting management. *Transactions of the ASABE*. 62(6): 1489-1508, 2019.

18. Fenila F. and Yogendra Shastri. Optimization of cellulose hydrolysis in a non-ideally mixed batch reactor. *Computers & Chemical Engineering*. 128: 340-351, 2019.

19. Prasad Mandade and Yogendra Shastri. Multi-objective optimization of lignocellulosic feedstock selection for ethanol production in India. *Journal of Cleaner Production*. 231: 1226-1234, 2019.

20. Pratik Gholkar, Yogendra Shastri, and Akshat Tanksale. Catalytic reactive flash volatilization of microalgae to produce hydrogen or methane-rich syngas. *Applied Catalysis B: Environmental*. 251: 326-334, 2019.

21. Vibhuti Chhabra, Sankar Bhattacharya, and Y. Shastri. Pyrolysis of mixed municipal solid waste: characterisation, interaction effect and kinetic modelling using the thermogravimetric approach. *Waste Management*. In press (available online).

22. Riju De, Sharad Bhartiya, and Y. Shastri. Multi-objective optimization of integrated biodiesel production and separation system. *Fuel*. 243: 519-532, 2019.

23. Vinod Vijay Kumar, Andrew Hoadley, and Y. Shastri. Dynamic impact assessment of resource depletion: A case study of natural gas in New Zealand. *Sustainable Production and Consumption*. 18: 165-178, 2019.

24. Sumit Kumar Verma and Y. Shastri. Deterministic and stochastic optimization of dilute acid pretreatment of sugarcane bagasse. *Biofuels*. In press (available online).

25. Deepanker Varshney, Prasad Mandade and Y. Shastri. Multi-objective optimization of sugarcane bagasse utilization in an Indian sugar mill. *Sustainable Production and Consumption*. 18: 96-114, 2019.

26. Payala Venkat Vikash and Y. Shastri. Conceptual design of a lignocellulosic biorefinery and its supply chain for ethanol production in India. *Computers & Chemical Engineering*. 121: 696-721, 2019.

27. S. Khan, P. Gholkar, Y. Shastri, N.G. Shah, and S. Bhartiya. Hydrothermal liquefaction of *Chlorella sp.* for biocrude oil production: Comparison of experimental and modeling results. *International Agricultural Engineering Journal*. In press.

28. Y. Mehta, B. Joseph, and Y. Shastri. Economic analysis and life cycle impact assessment of Municipal Solid Waste (MSW) disposal: A case study of Mumbai, India. *Waste Management & Research.* Available online.

29. Payala Venkat Vikash, Prasand Mandade, and Y. Shastri. Assessment of bagasse and trash utilization for ethanol production: A case study in India. *Environmental Progress & Sustainable Energy*. Available online.

30. Sumit Kumar Verma, Fenila F., A. Soren, and Y. Shastri. Impact of uncertainties on the biomass to biofuel systems. *CAB Reviews*, 12(22), 2017.

31. S. Sen Gupta, Y. Shastri and S. Bhartiya. Integrated microalgae biorefinery: Impact of product demand profile and prospect of carbon capture. *Biofuels, Bioproducts & Biorefining*. 11(6): 1065-1076, 2017.

32. S. Sen Gupta, Y. Shastri and S. Bhartiya. Optimization of integrated microalgal biorefinery producing fuel and value added products. *Biofuels, Bioproducts & Biorefining*. . 11(6): 1030-1050, 2017.

33. Y. Shastri. Renewable energy, Bioenergy. *Current Opinion in Chemical Engineering*. 17: 42-47, 2017.

34. Suryanarayana Vegi and Y. Shastri. Optimal control of dilute acid pretreatment and enzymatic hydrolysis for processing lignocellulosic feedstock. *Journal of Process Control*. 35: 100-111, 2017.

35. Sumit Kumar Verma, Fenila F., and Y. Shastri. Sensitivity analysis and stochastic modelling of lignocellulosic feedstock pretreatment and hydrolysis. *Computers & Chemical Engineering.* 106: 23-39, 2017.

36. P. Maheshwari, S. Singla and Y. Shastri. Resiliency optimization of biomass to biofuel supply chain incorporating regional biomass pre-processing depots. *Biomass and Bioenergy*. 97: 116-131, 2017.

37. Fenila F. and Y. Shastri. Optimal control of enzymatic hydrolysis of lignocellulosic biomass. *Resource-Efficient Technologies*. 2(1): S96-S104, 2016.

38. V. Chhabra, Y. Shastri and S. Bhattachrya. Kinetics of pyrolysis of mixed municipal solid waste. *Procedia Environmental Sciences*. 35: 513-527, 2016.

39. S. Sen Gupta, Y. Shastri and S. Bhartiya. Model-based optimization of biodiesel production from microalgae. *Computers & Chemical Engineering*, 89: 222-249, 2016.

40. R. Kern and Y. Shastri. Advanced control with parameter estimation of batch transesterification reactor. *Journal of Process Control*, 33: 127-139, 2015

41. T. Lin, L. Rodriguez, S. Davis, M. Khanna, Y. Shastri, T. Grift, S. Long, and K.C. Ting. Biomass feedstock preprocessing and long distance transportation logistics. *GCB Bioenergy*, 8(1): 160-170, 2015.

42. A. Soman and Y. Shastri. Optimization of novel photobioreactor design using computational fluid dynamics. *Applied Energy*, 140: 246-255, 2015.

43. S. Sen Gupta, S. Bhartiya, and Y. Shastri. The practical implementation of algal biodiesel: Challenges and potential solution. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources,* 9(20): 1-12, 2014.

44. Y. Shastri, Z. Miao, L.F. Rodriguez, T.E. Grift, A.C. Hansen, and K.C. Ting. Determining optimal size reduction and densification for biomass feedstock using the BioFeed optimization model. *Biofuels, Bioproducts & Biorefining*, 8(3): 423-437, 2014.

45. T. Lin, L.F. Rodriguez, Y. Shastri, A.C. Hansen, and K.C. Ting. Integrated strategic and tactical biomass-biofuel supply chain optimization. *Bioresource Technology*, 156: 256-266, 2014.

46. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Advances in systems informatics and analysis of biomass feedstock production for bioenergy. *Pertanika Journal of Science and Technology,* 21(1): 273-280, 2013.

47. T. Lin, L.F. Rodriguez, Y. Shastri, A.C. Hansen, and K.C. Ting. GIS enabled biomass-ethanol supply chain optimization. *Biofuels, Bioproducts & Biorefining*, 7(3): 314-333, 2013.

48. Y. Shastri. Sustainability models. *Encyclopedia of Agricultural, Food and Biological Engineering – Sustainability of the Food Systems, Second Edition,* Taylor & Francis Online, January 2013.

49. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Switchgrass – practical issues in developing a fuel crop. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources,* 7(37): 1-14, 2012.

50. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Impact of probability of working day on planning and operation of biomass feedstock production systems. *Biofuels, Bioproducts & Biorefining*, 6(3): 281-291, 2012.

51. Z. Miao, Y. Shastri, T.E. Grift, A.C. Hansen and K.C. Ting. Lignocellulosic biomass feedstock transportation alternatives, logistics, equipment configurations and modeling. *Biofuels, Bioproducts & Biorefining*, 6(3): 351-362, 2012.

52. Y. Shastri, L.F. Rodriguez, A.C. Hansen and K.C. Ting. Impact of distributed storage and pre-processing on Miscanthus production and provision systems. *Biofuels, Bioproducts & Biorefining*, 6(1): 21-31, 2012.

53. Y. Shastri, L.F. Rodriguez, A.C. Hansen and K.C. Ting. Agent-based analysis of biomass feedstock production system dynamics. *BioEnergy Research*, 4(4): 258-275, 2011.

54. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Development and application of BioFeed model for optimization of herbaceous biomass feedstock production. *Biomass & Bioenergy*, 35(7): 2961-2974, 2011.

55. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. A novel decomposition and distributed computing approach for the solution of large scale optimization models. *Computers & Electronics in Agriculture*, 76(1): 69-79, 2011.

56. Y. Shastri and U. Diwekar. Stochastic modeling for uncertainty analysis and multi-objective optimization of IGCC system with single-stage coal gasification. *Industrial & Engineering Chemistry Research*, 50(9): 4879-4892, 2011.

57. U. Diwekar and Y. Shastri. Design for environment: a state of the art review. *Clean Technologies and Environmental Policy*, 13(2): 227-240, 2011.

58. Y. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Optimization of Miscanthus harvesting and handling as energy crop: BioFeed model application. *Biological Engineering Transactions*, 3(1): 37-69, 2011.

59. Y. Shastri, U. Diwekar and S. Mehrotra. An innovative trading approach for sustainable mercury waste management. *International Journal of Innovation & Science*, 3(1): 9-22, 2011.

60. U. Diwekar and Y. Shastri. Green process design, green energy, and sustainability: A systems analysis perspective. *Computers & Chemical Engineering*, 34(9): 1348-1355, 2010.

61. Y. Shastri and U. Diwekar. L-Shaped BONUS algorithm with application to water pollutant trading. *Industrial & Engineering Chemistry Research*, 47(23): 9417-9425, 2008.

62. Y. Shastri, U. Diwekar, H. Cabezas and J. Williamson. Is sustainability achievable? Exploring the limits of sustainability with model systems. *Environmental Science & Technology*, 42(17): 6710-6716, 2008.

63. Y. Shastri, U. Diwekar and H. Cabezas. Optimal control theory for sustainable environmental management. *Environmental Science & Technology*, 42(14): 5322-5328, 2008.

64. Y. Shastri and U. Diwekar. Optimal control of lake pH for mercury bioaccumulation control. *Ecological Modelling*, 216(1): 1-17, 2008.

65. Y. Shastri and U. Diwekar. Sustainable ecosystem management using optimal control theory: Part 1 (Deterministic systems). *Journal of Theoretical Biology*, 241(3): 506-521, 2006.

66. Y. Shastri and U. Diwekar. Sustainable ecosystem management using optimal control theory: Part 2 (Stochastic systems). *Journal of Theoretical Biology*, 241(3): 522-531, 2006.

67. Y. Shastri and U. Diwekar. Sensor placement in water networks: A stochastic programming approach. *Journal of Water Resources Planning and Management*, 132(3): 192-203, May/June 2006.

68. Y. Shastri and U. Diwekar. An efficient algorithm for large scale stochastic nonlinear programming problems. *Computers & Chemical Engineering*, 30(5): 864-877, 2006.

Technical Reports:

1. Y. Shastri and U. Diwekar. Optimal control theory for sustainable environmental management under uncertainty: Phase II. United Stated Environmental Protection Agency (USEPA), Contract EP05C000413, November 2008.
2. Y. Shastri, J. Salazar and U. Diwekar. APECS CAPE-OPEN compliant uncertainty analysis framework. National Energy Technology Laboratory (NETL), Contract: Subtask 41817.312.01.06, September 2008.
3. Y. Shastri and U. Diwekar. APECS CAPE-OPEN compliant uncertainty analysis framework. National Energy Technology Laboratory (NETL), Contract: Subtask 41817.312.01.06, March 2008.
4. Y. Shastri and U. Diwekar. APECS CAPE-OPEN compliant stochastic modeling, multi-objective optimization, and reduced order modeling capabilities. National Energy Technology Laboratory (NETL), Contract: Subtask 41817.312.16, October 2007.
5. Y. Shastri and U. Diwekar. Optimal control theory for sustainable environmental management under uncertainty. United Stated Environmental Protection Agency (USEPA), Contract EP05C000413, September 2007.

Edited books:
1. Y.N. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. *Engineering and Science of Biomass Feedstock Production and Provision*, Springer Science Publishers, ISBN: 978-1-4899-8014-4, 2014.

Book Chapters:

1. Y.N. Shastri and K.C. Ting. Biomass feedstock production and provision: Overview, current status, and challenges. In *Engineering and Science of Biomass Feedstock Production and Provision*, Y. Shastri, L.F. Rodriguez, A.C. Hansen and K.C. Ting (Ed.), pp. 1-15, Springer Science Publishers, ISBN: 978-1-4899-8014-4, 2014.
2. Y.N. Shastri, A.C. Hansen, L.F. Rodriguez and K.C. Ting. Systems informatics and analysis. In *Engineering and Science of Biomass Feedstock Production and Provision*, Y. Shastri, L.F. Rodriguez, A.C. Hansen and K.C. Ting (Ed.), pp. 195-232, Springer Science Publishers, ISBN: 978-1-4899-8014-4, 2014.
3. Z. Miao, Y.N. Shastri, T.E. Grift, and K.C. Ting. Lignocellulosic biomass feedstock supply logistics and system integration. In *Biomass Processing, Conversion and Biorefinery*, Bo Zhang and Y. Wang (Ed.), pp. 37-60, Nova Science Publishers, Hauppauge, New York, ISBN: 978-1-62618-346-9, 2013.
4. Y. Shastri and U. Diwekar. Freshwater ecosystem conservation and management: A control theory approach. In *Freshwater Ecosystems and Aquaculture Research*, Felice De Carlo and Alessio Bassano (Ed.), pp. 301-345, Nova Science, ISBN: 978-1-61209-419-9, 2010.
5. Y. Shastri and U. Diwekar. Industrial pollution management: A sustainability perspective. In *Industrial Waste: Environmental Impact, Disposal and Treatment*, John Samuelson (Ed.), pp. 121-204, Nova Science, ISBN: 978-1-60692-720-5, 2009.
6. U. Diwekar and Y. Shastri. Nonlinear programming. In *Introduction to Applied Optimization* (2$_{nd}$ edition), U. Diwekar (Author), Kluwer Academic Publishers, Netherlands.

Monograph:

1. Y. Shastri. Sustainable system management: Achieving sustainability with a systems theory approach. VDM Verlag, Germany, ISBN: 363904715X, 2008

Book Review:

1. U. Diwekar and Y. Shastri. Sustainability science and engineering: Defining principles. Martin A. Abraham (Ed.), Elsevier. In *Environmental Progress* 26(1): 11-14, 2007.

Media/Other:

1. Developed educational module titled "Optimization methods for sustainability" for the Computing & Systems Technology Division of AIChE through the Sustainability Manufacturing Case Studies (SMCS) initiative, January 2016.
2. Stanford Social Innovation Review, Winter 2009: Reviewed the research paper titled 'Is sustainability achievable? Exploring the limits of sustainability with model systems' from Environmental Science & Technology, 42, 2008.

Peer Reviewed Conference Proceedings:

1. V. Punnathanam and Y. Shastri. Optimization of a large-scale biorefinery problem by decomposition. At *29th European Symposium on Computer Aided Process Engineering (ESCAPE-29)*, Eindhoven (The Netherlands), June 2019.
2. V. Kumar, A. Hoadley, Y. Shastri. Dynamic evaluating of the economic and environmental impact of resource depletion for a new chemical project. At *PRES (Process Integration, Modeling and Optimization for Energy Saving and Pollution Reduction) conference*, Prague, Czech Republic, 2018.
3. Deepankar Varshney, Prasad Mandade, and Y. Shastri. Optimization of sugarcane bagasse based industrial cluster for economic and environmental benefits. At Process Systems Engineering (PSE) 2018, San Diego, USA, 2018.
4. Payala Venkat Vikash and Y. Shastri. Economic optimization of integrated lignocellulosic biorefinery. In *ESCAPE 27 (European Symposium on Computer Aided Process Engineering)*, Barcelona, Spain, 2017.
5. Sumit Kumar Verma and Y. Shastri. Deterministic and stochastic optimization of acid pretreatment for lignocellulosic ethanol production. In *ESCAPE 27 (European Symposium on Computer Aided Process Engineering)*, Barcelona, Spain, 2017.
6. Riju De, S. Bhartiya and Y. Shastri. Multi-objective optimization of a batch transesterification reactor for biodiesel production. In *ESCAPE 27 (European Symposium on Computer Aided Process Engineering)*, Barcelona, Spain, 2017.
7. S. Sen Gupta, Y. Shastri and S. Bhartiya. Impact of protein co-production on techno-economic feasibility of microalgal biodiesel. In *ESCAPE 26 (European Symposium on Computer Aided Process Engineering)*, Portoroz, Slovenia, 2016
8. Y. Shastri. Process systems engineering for techno-economic feasibility of microalgal biofuels. In *PSE Asia 2016*, 7th *International Symposium on Design, Operation and Control of Chemical Processes*, Tokyo (Japan), July 2016.
9. Suryanarayana Vegi and Y. Shastri. Economic optimization of dilute acid pretreatment of lignocellulosic feedstock. In *PSE Asia 2016*, 7th *International Symposium on Design, Operation and Control of Chemical Processes*, Tokyo (Japan), July 2016.
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<u>Reviewer:</u>

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