

# YUHE TIAN

Assistant Professor

Department of Chemical and Biomedical Engineering, West Virginia University

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## EDUCATION

Texas A&M University, College Station, TX	Ph.D. in Chemical Engineering	2016-2021
Tsinghua University, Beijing, China	B.Sc. in Chemical Engineering	2012-2016
	B.Sc. in Pure & Applied Mathematics	

## PROFESSIONAL EXPERIENCE

West Virginia University, Morgantown, WV

Assistant Professor, Department of Chemical and Biomedical Engineering

2021-present

## RESEARCH ACTIVITIES

### Area of Expertise: Process Systems Engineering

Computer-aided process intensification, Process synthesis and optimization, Multiscale energy systems, Supply chain optimization, Mechanistic/data-driven modeling

### Publication Statistics: As of July 15, 2022

1 Authored Book, 11 Journal Publications, 400+ Google Scholar Citations

6 Peer-Reviewed Conference Proceedings, 20+ Research Presentations

## HONORS & ACHIEVEMENTS

- **Finalist Award** of for American Institute of Chemical Engineers (AIChE) Computing & Systems Technology (CAST) Division Directors' Student Presentation Awards 2020
- **Most Downloaded & Most Cited Article** in *Chemical Engineering and Processing: Process Intensification Journal* – Tian, Demirel, Hasan, Pistikopoulos (2018)
- **Chair/Co-Chair of Sessions** at AIChE Annual Meeting and Spring Meeting:
  - CAST Division: 10A Process Intensification through Process Systems Engineering (2021, 2022), 10B Modeling, Control, and Optimization of Energy Systems (2022)
  - Environmental Division: Environmental Issues and Controls in Select Industrial Sectors (2022), Carbon Management and Sustainability (2022)
- **Peer Reviewer** of major academic journals and conferences in process systems engineering, control, optimization, energy systems with 100+ distinct manuscripts

## TEACHING EXPERIENCES

- **Course Instructor** | *West Virginia University*
  - CHE 355 Process Simulation and Design Spring 2022
  - DOE/RAPID Short Course CH377 Strategies for Computer-Aided Process Intensification 2021
- **Team Member for Course Development** | *PIs: Drs. Hasan, Pistikopoulos, El-Halwagi*
  - DOE/RAPID Education & Workforce Development Project: COMPLETE – Computer-aided, Model-based Process Intensification Learning, Training, and Education 2020-2021
  - DOE/RAPID eLearning ELA 351: Modeling and Simulation for Process Intensification 2020
  - DOE/RAPID eLearning ELA 350: Process Design for Process Intensification 2019
- **Teaching Communities**
  - Member, American Society for Engineering Education Dean's Program 2022-present
  - Member, AIChE Education Division 2021-present
  - Junior Mentor, AIChE Future Faculty Mentoring Program 2021-present

- Mentee, AIChE Future Faculty Mentoring Program 2020-2021
- Associate Certificate, Center for the Integration of Research, Teaching & Learning 2020
- Member, Texas A&M Academy for Future Faculty 2019-2021

### **MENTROING EXPERIENCES**

- **Doctoral Advisory Committee Chair** | *West Virginia University*
  - Ayooluwa Akintola 2021-present  
Project: Process Synthesis Intensification for Multi-Scale Reaction Systems
  - Benjamin Akoh 2021-present  
Project: An Optimization Framework for Energy Supply Chain Decarbonization
- **Undergraduate Research Advisor** | *West Virginia University*
  - Joshua Swecker 2021-present  
Project: Machine Learning-Assisted Microwave Catalytic Process Optimization

### **BOOK**

1. Pistikopoulos, E. N., **Tian, Y.** Synthesis and Operability Strategies for Computer-Aided Modular Process Intensification, Elsevier, 2022.

### **JOURNAL ARTICLES**

1. **Tian, Y.**, Meduri, V., Bindlish, R., Pistikopoulos, E. N. A Process Intensification Synthesis Framework for the Design of Dividing Wall Column Systems, *Computers & Chemical Engineering*. Available Online. (*Invited Special Issue: In Honor of Prof. George Stephanopoulos*)
2. **Tian, Y.**, Pistikopoulos, E. N. A process intensification synthesis framework for the design of extractive separation systems with material selection, *Journal of Advanced Manufacturing and Processing*, e10097, 2021. (*Invited Special Issue: Advancing U.S. Manufacturing: A Focus on the AIChE RAPID Manufacturing Institute for Process Intensification and Modularization*)
3. Pistikopoulos, E. N., **Tian, Y.**, Bindlish, R. Operability and Control in Process Intensification and Modular Design: Challenges and Opportunities, *AIChE Journal*, e17204, 2021.
4. **Tian, Y.**, Pappas, I., Burnak, B., Katz, J., Pistikopoulos, E. N. Simultaneous Design & Control of a Reactive Distillation System – A Parametric Optimization & Control Approach, *Chemical Engineering Science*, 230, 116232, 2021.
5. **Tian, Y.**, Pistikopoulos, E. N. Towards an Envelope of Design Solutions for Combined/Intensified Reaction/Separation Systems. *Industrial & Engineering Chemistry Research*, 59(24), 11350–11354, 2020.
6. **Tian, Y.**, Pappas, I., Burnak, B., Katz, J., Pistikopoulos, E. N. A Systematic Framework for Synthesis of Operable Process Intensification Systems – Reactive Separation, *Computers & Chemical Engineering*, 134, 106675, 2020. (*Invited Special Issue: 29th European Symposium of Computer Aided Process Engineering*)
7. Avraamidou, S., Baratsas, S., **Tian, Y.**, Pistikopoulos, E. N. Circular Economy – A Challenge and an Opportunity for Process Systems Engineering. *Computers & Chemical Engineering*, 133, 106629, 2020. (*Invited Special Issue: In Honor of Prof. Roger H. W. Sargent*)
8. **Tian, Y.**, Pistikopoulos, E. N. Synthesis of Operable Process Intensification Systems – Steady-State Design with Safety and Operability Considerations. *Industrial & Engineering Chemistry Research*, 58(15), 6049-6068, 2019. (*Invited Special Issue: Frameworks for Process Intensification and Modularization*)
9. **Tian, Y.**, Pistikopoulos, E. N. Synthesis of Operable Process Intensification Systems: Advances and Challenges. *Current Opinion in Chemical Engineering*, 25, 101-107, 2019. (*Invited Special Issue: Process Systems Engineering: process intensification*)
10. **Tian, Y.**, Demirel, S. E., Hasan, M. M. F., Pistikopoulos, E. N. An Overview of Process Systems Engineering Approaches for Process Intensification: State of the Art. *Chemical Engineering and Processing: Process Intensification*, 133, 160-210, 2018. (*Invited Review Article*)
11. Niziolek, A. M., Onel, O., **Tian, Y.**, Floudas, C. A., Pistikopoulos, E. N. Municipal Solid Waste to Liquid Transportation Fuels – Part III: An Optimization-Based Nationwide Supply Chain Management Framework.

Computers & Chemical Engineering, 116, 468-487, 2018. (*Invited Special Issue: Multi-scale Systems Engineering – in memory & honor of Professor C.A. Floudas*)

### **PEER-REVIEWED CONFERENCE PROCEEDINGS**

1. Vedant, S., Atencio, M. R., **Tian, Y.**, Meduri, V., Pistikopoulos, E. N. Towards a Software Prototype for Synthesis of Operable Process Intensification Systems. 31st European Symposium on Computer Aided Process Engineering (ESCAPE-31), June 2021. In Computer Aided Chemical Engineering, 50, 767-772. Elsevier.
2. **Tian, Y.**, Pistikopoulos, E. N. Operability and Safety Considerations in Process Intensification. 21st International Federation of Automatic Control (IFAC) World Congress, July 2020. In IFAC-PapersOnLine, 53(2), 11434-11439.
3. **Tian, Y.**, Pistikopoulos, E. N. Generalized Modular Representation Framework for the Synthesis of Extractive Separation Systems. Foundations of Computer-Aided Process Design (FOCAPD 2019), July 2019, Copper Mountain, Colorado. In Computer Aided Chemical Engineering, 7, 475-480. Elsevier.
4. **Tian, Y.**, Pappas, I. S., Burnak, B., Katz, J., Avraamidou, S., Diangelakis, N. A., Pistikopoulos, E. N. Towards a Systematic Framework for the Synthesis of Operable Process Intensification Systems – Application to Reactive Distillation Systems. 29th European Symposium on Computer-Aided Process Engineering (ESCAPE-29), June 2019, Eindhoven, Neitherlands. In Computer Aided Chemical Engineering, 46, 73-78. Elsevier.
5. **Tian, Y.**, Mannan, M. S., Pistikopoulos, E. N. Towards a Systematic Framework for the Synthesis of Operable Process Intensification Systems. 13th International Symposium on Process Systems Engineering (PSE 2018), July 2018, San Diego, California. In Computer Aided Chemical Engineering, 44, 2383-2388. Elsevier.
6. **Tian, Y.**, Mannan, M. S., Kravanja, Z., Pistikopoulos, E. N. Towards the Synthesis of Process Intensification Systems with Safety and Operability Considerations – Application to Heat Exchanger Network. 28th European Symposium on Computer-Aided Process Engineering (ESCAPE-28), June 2018, Graz, Austria. In Computer Aided Chemical Engineering, 43, 705-710. Elsevier.

### **RESEARCH PRESENTATIONS (\* Corresponding author)**

1. **Tian, Y.\***, Akintola, A. Modular Process Intensification Synthesis of Membrane-Based Reactive Separation Systems for Sustainable Hydrogen Production. Advanced Manufacturing and Processing Conference 2022, June 2022, Bethesda, Maryland. (**Invited Talk**)
2. Zitney, S., Bhattacharyya, D., Lima, F., **Tian, Y.** Science-Informed Virtual Digital Twin for an Integrated Energy System with Carbon Capture: Research, Training, and Education. Advanced Manufacturing and Processing Conference 2022, June 2022, Bethesda, Maryland. (**Invited Talk**)
3. **Tian, Y.\*** Synthesis and Operability Strategies for Computer-Aided Modular Process Intensification. Virtual joint group seminar of Dr. Antonio del Rio Chanona and Dr. Dongda Zhang. May 2022. (**Invited Talk**)
4. **Tian, Y.\***, Innovation-Driven Sustainable Process Systems Engineering. AIChE Student Chapter Meeting, February 2022, Morgantown, West Virginia.
5. **Tian, Y.\***, Pistikopoulos, E. N. A Process Intensification Synthesis Approach to Adsorption-Based Reactive Separation Systems. AIChE Annual Meeting, November 2021, Boston, Massachusetts.
6. **Tian, Y.**, Meduri, M., Bindlish, R., Pistikopoulos, E. N. A Process Intensification Synthesis Framework for the Design of Divided Wall Columns. AIChE Annual Meeting, November 2021, Boston, Massachusetts.
7. Rivera, M., Vedant, S., Pistikopoulos, E. N., **Tian, Y.\*** A Data-Driven Optimization Approach and Software Toolkit for Modular Process Intensification Synthesis. AIChE Annual Student Conference, November 2021, Boston, Massachusetts. (**AIChE Undergraduate Student Poster Competition**)
8. **Tian, Y.\*** Process Intensification Synthesis of Multi-Scale and Multi-Functional Reaction Systems. 2021 Annual Meeting of Pittsburgh-Cleveland Catalysis Society, October 2021, Pittsburgh, Pennsylvania.
9. Avraamidou, S., **Tian, Y.**, Pistikopoulos, E. N. Process Modeling, Optimization and Intensification. Ascend Performance Materials LLC, May 2021.
10. **Tian, Y.**, Pistikopoulos, E. N. A Framework for Synthesis of Operable Process Intensification Systems. AIChE Annual Meeting, November 2020. (**Invited to CAST Director’s Student Presentation Award Session**)

11. **Tian, Y.**, Vlachos, D. G., Pistikopoulos, E. N. Generalized Modular/Collocation Framework for Representation and Synthesis of Intensified Multi-Scale Reaction Systems. AIChE Annual Meeting, November 2020.
12. **Tian, Y.**, Meduri, V., Vedant, S., Bindlish, R., Pistikopoulos, E. N. Process Design and Intensification of Dividing Wall Column for a Methyl Methacrylate Separation Process. AIChE Annual Meeting, November 2020.
13. **Tian, Y.** A Modular Approach to Process Intensification – Modeling, Optimization and Control. AIChE Annual Meeting, November 2020.
14. García-López, C. A., **Tian, Y.**, Pistikopoulos, E. N., Jiménez-Gutiérrez, A. Design and Control Optimization of Pressure Swing Adsorption Systems for Hydrogen Recovery from IGCC Plants with Co-Capture of Carbon Dioxide. AIChE Annual Meeting, November 2020.
15. **Tian, Y.** Computer-Aided Process Intensification: Synthesis, Operability & Control. West Virginia University, November 2020.
16. **Tian, Y.**, Pistikopoulos, E. N. Design and Optimization of Operable Process Intensification Systems. **Texas A&M Chemical Engineering Departmental Seminar**, October 2020.
17. **Tian, Y.** A Systematic Framework for Synthesis of Operable Process Intensification Systems. The Dow Chemical Company, September 2020.
18. **Tian, Y.**, Pistikopoulos, E. N. Material Selection in Process Intensification – Application to Extractive Separation Systems. AIChE Spring Meeting, August 2020.
19. **Tian, Y.**, Pappas, I. S., Burnak, B., Katz, J., Pistikopoulos, E. N. Process Intensification Framework for Reactive Separation Systems. AIChE Annual Meeting, November 2019, Orlando, Florida.
20. **Tian, Y.**, Pappas, I. S., Avraamidou, S., Pistikopoulos, E. N. A Modular Approach to Process Integration and Intensification. AIChE Annual Meeting, November 2019, Orlando, Florida.
21. **Tian, Y.**, Pappas, I. S., Avraamidou, S., Pistikopoulos, E. N. Process Intensification Framework for Extractive Separation Systems. AIChE Annual Meeting, November 2019, Orlando, Florida.
22. **Tian, Y.**, Demirel, S. E., Li, J., Avraamidou, S., Tula, A. K., Eden, M. R., Hasan, M. M. F., Gani, R., Pistikopoulos, E. N. Towards a Unified Strategy and Prototype Software Platform for the Synthesis of Operable & Sustainable Process Intensification Systems. AIChE Annual Meeting, November 2019, Orlando, Florida.
23. **Tian, Y.**, Pappas, I. S., Katz, J., Burnak, B., Pistikopoulos, E. N. Towards the Incorporation of Operability and Safety in the Synthesis of Intensified Reactive Separation Systems. AIChE Spring Meeting, April 2019.
24. **Tian, Y.**, Mannan, M. S., Pistikopoulos, E. N. Towards a Systematic Process Intensification Framework for Advanced Distillation Systems. AIChE Annual Meeting, October 2018, Pittsburgh, Pennsylvania.
25. Pistikopoulos, E. N., Sholl, D., Hasan, M. M. F., Demirel, S. E., **Tian, Y.** Modeling and Simulation Challenges for Process Intensification. AIChE Annual Meeting, October 2017, Minneapolis, Minnesota.
26. **Tian, Y.**, Pistikopoulos, E. N., Mannan, M. S. Towards a Systematic Framework for the Synthesis of Safely Operable Process Intensification Systems. Mary Kay O'Connor Safety Center 2017 International Symposium, October 2017, College Station, Texas.
27. **Tian, Y.**, Mannan, M. S., Pistikopoulos, E. N. Towards an Integrated Framework for the Synthesis of Operable Process Intensification Systems. Texas A&M Energy Research Society Conference on Energy. September 2017.