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- 國立中央大學 學士，民國一百零四年
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- B.S. National Central University, 2015
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主要研究領域

▪人工智慧與數據科學

人工智慧與數據科學可以為化工製程建立預測模型，利用模型來監測與分析製程，從而找出提升效率、減少污染的最佳方法。我們的目標是開發更先進的AI模型與數據科學技術，讓化工程序運作得更高效，同時降低對環境的影響，邁向永續發展。

▪ 數據驅動最佳化

數據驅動最佳化是利用數據，來找到最理想的解決方案。在化工領域，就是利用製程數據來找出能讓效率最高、污染最低的操作條件。本團隊的目標是研發運算成本低、快速且可靠的最佳化數學方法，並應用於化工與AI領域。

▪ 隨機模型預測控制

化工程序中常存在許多不確定因素，例如未知的化學反應或進料波動等。隨機模型預測控制是一種專門用於處理這種情境的控制方法，能在確保安全與可行性的前提下，找出最佳的控制策略。本團隊的目標是開發創新、容易使用、運算快速且可靠的隨機模型預測控制方法，並應用於複雜化工製程。

Main Research Interests

▪ Artificial Intelligence and Data Science

Artificial intelligence and data science can build predictive models for chemical processes, using these models to monitor and analyze the processes to identify optimal methods for improving efficiency and reducing pollution. Our goal is to develop more advanced AI models and data science technologies to enable chemical processes to operate more efficiently while minimizing environmental impact, paving the way toward sustainable development.

▪ Data-Driven Optimization

Data-driven optimization is a technique that uses data to find the optimal solution. In the field of chemical engineering, it involves using process data to determine the operating conditions that achieve the highest efficiency and the lowest pollution. Our team's goal is to develop low computational burden and reliable mathematical optimization methods and apply them in the chemical engineering and AI fields.

▪ Stochastic Model Predictive Control

In chemical processes, there are often many uncertainties, such as unknown chemical reactions or fluctuations in feed flow. Stochastic model predictive control is a method specifically designed to handle these scenarios, capable of identifying the optimal control strategy while ensuring safety and feasibility. Our team's goal is to develop innovative, user-friendly, computationally efficient, and reliable stochastic model predictive control methods and apply them to complex chemical processes.

代表作 (Selected Publications)

- **Yang, S. B.**, Kammammettu, S., & Li, Z. (2023). Data-driven distributionally robust chance-constrained optimization with large data set and outliers: Sequential sample removal algorithm for solution improvement. *Computers & Chemical Engineering, 179*, 108407.
- **Yang, S. B.**, Moreira, J., & Li, Z. (2023). Bioinspired encoderdecoder recurrent neural network with attention for hydroprocessing unit modeling. *Industrial & Engineering Chemistry Research, 62*(44), 18526-18540.
- **Yang, S. B.**, & Li, Z. (2023). Distributionally robust chance-constrained optimization with Sinkhorn ambiguity set. *AIChE Journal, 69*(10), e18177.
- **Yang, S. B.**, & Li, Z. (2022). Kernel distributionally robust chance-constrained process optimization. *Computers & Chemical Engineering, 165*, 107953.
- **Yang, S. B.**, Li, Z., & Moreira, J. (2022). A recurrent neural network-based approach for joint chance constrained stochastic optimal control. *Journal of Process Control, 116*, 209-220.
- **Yang, S. B.**, Moreira, J., & Li, Z. (2022). Predicting crude oil properties using fourier-transform infrared spectroscopy (FTIR) and data-driven methods. *Digital Chemical Engineering, 3*, 100031.
- **Yang, S. B.**, Li, Z., & Wu, W. (2021). Data-driven process optimization considering surrogate model prediction uncertainty: A mixture density network-based approach. *Industrial & Engineering Chemistry Research, 60*(5), 2206-2222.