



## 鄭西顯 教授

### SHI-SHANG JANG, PROFESSOR

- 國立清華大學 學士，民國六十七年
- 國立台灣大學 碩士，民國六十九年
- 美國華盛頓大學 博士，民國七十五年
- B.S. National Tsing-Hua University, ROC, 1978
- M.S. National Taiwan University, ROC, 1980
- D. Sc. Washington University, U.S.A., 1986

## 主要研究領域

本實驗室之主題為將控制及最佳化理論應用到工業界之製程上。尤其是商業軟體ASPEN及ANSYS之應用為主要之課題。

### ■ 二氧化碳補捉及再利用

研究方向包含化學吸收法之技術發展及設計、放大以及二氧化碳循環再利用。

### ■ 應用CFD模擬及3D列印技術改善傳統化學吸收塔之效率

本研究為應用ANSYS中CFD模擬優化吸收塔之參數及用3D列印技術設計最佳之幾何填充物。

### ■ 人工智慧製程錯誤診斷技術之發展

以各種人工智慧及訊號處理技術發展製程錯誤診斷之方法。

### ■ 新型變頻冷卻水塔節能技術

本研究提出一個簡單的數據驅動模型，來操作工業用冷卻水塔之變頻風扇，以達到節能之目的。

## Main Research Interests

The objective of our research is to implement control and optimization theory to processes interested of chemical industries. Commercial simulation packages including ASPEN and ANSYS are our main tools for chemical system development.

### ■ Development and Application of CO2 Capture and Utilization Technologies for Post-Combustion

The objects of our researches includes chemical absorption simulation, design and scale-up. CO2 recycle and utilization are also important directions.

### ■ Traditional tower mass transfer efficiency improvement by CFD technology combined with 3D printing

The purpose of this study is to optimize the system parameters and control methods by fluid dynamics with the implementation of fluid dynamic simulation and geometric optimization technology using 3D printing.

### ■ Fault Classification Using Artificial Intelligence

Various fault classification for industrial processes based on artificial intelligence method in combination with signal processing techniques.

### ■ Energy Conservation of Cooling Towers

This study present a strategy to operate the variable frequency drives fans on cooling towers in industry by a simple data-driven model.

## 代表作 (Selected Publications)

- “Design and Application of a Variable Selection Method for Multi-layer Perceptron Neural Network with LASSO” IEEE Transactions on Neural Networks and Learning Systems, 28, 6, 1386-1396, 2017.
- “A Comparison between Packed Beds and Rotating Packed Beds for CO2 Capture Using Monoethanolamine and Dilute Aqueous Ammonia Solutions”, International Journal of Green House Gas Control, 46, 228-239, 2016.
- “Model Predictive Control for Improving Waste Heat Recovery in Coke Dry Quenching Processes”, Energy, 80, 275-283, 2015.
- Chun-Cheng Chang, Shyan-Shu Shieh, **Shi-Shang Jang\***, Chan-Wei Wu, Ying Tsou, “Energy Conservation Improvement and ON-OFF Switch Times Reduction for an Existing VFD-fan-based Cooling Tower”, Applied Energy, 154, 491-499, 2015.