# Lingqing Yan

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## OBJECTIVE

Seeking a full-time R&D or engineering position where I can utilize my skills in advanced separation process modeling, design optimization and control.

## EDUCATION

**PhD Candidate, Chemical Engineering** **May 2021**
The University of Texas at Austin GPA: 3.94/4.00
Advisors: Dr. Michael Baldea and Dr. Thomas F. Edgar

**Bachelor of Science, Chemical and Bimolecular Engineering** **May 2016**
The University of Illinois Urbana-Champaign GPA: 3.82/4.00
Advisors: Dr. John A. Rogers and Dr. Hong Yang

## RESEARCH EXPERIENCE

**Graduate Research Assistant, The University of Texas at Austin** Oct 2016 - Present

Development of novel operation strategy to reduce separation energy, no need of additional capital investment

- Utilized system's intrinsic nonlinearity and dynamics to improve system's energy performance
- Evaluated steady-state and dynamic nonlinear behaviors of system to confirm energy savings
- Reduced energy cost by 1.5% - 3.6% for conventional binary/ternary distillation columns if imposing periodic forcing to replace standard single steady-state operation; validated results using Aspen Plus, Aspen Dynamics and Excel VBA simulations
- Used MATLAB to read input-output data from ternary column in Aspen Dynamics, developed a data-driven model with 94%+ NMSE; Utilized gPROMS to dynamically optimize the operation strategy of ternary surrogate model and reduced operating cost by 5.5%
- Proposed a new dividing wall column separation of ethylene glycol; the simplified new design can reduce cost by 6.8%
- Improved 1.4 - 1.9% energy performance of intensified processes (i.e., dividing wall columns) through periodic operation
- Interacted closely with industry partner and sponsor through written progress reports and oral presentations
- Current project outputs: 3 journal paper publications + 3 in paper preparation + 1 US patent

**Undergrad Research Assistant, The University of Illinois Urbana-Champaign** Jun 2014 - May 2016

- Micro-fabricated and tested wireless functional electrodes/strain sensors for human-machine interface
- Synthesized monodisperse functional metal nanomaterials and nanostructures with controlled morphology
- Chemically controlled surface composition of Pt and dispersion of Pt and Ag atoms for octahedral catalysts
- Inspected safety of 5+ lab spaces weekly and took responsibility of chemical waste disposal
- Project outputs: 5 journal paper publications

## WORK EXPERIENCE

**Teaching Assistant, The University of Texas at Austin** Jan 2018 - Dec 2018

- Gave step-by-step analysis in weekly recitations/office hours for 70+ undergraduates in “Process Control”
- Introduced problem-solving strategies and emphasized core concepts for 30 graduate students in “Advanced Thermodynamics”

**Undergrad Teaching Assistant, The University of Illinois Urbana-Champaign** Aug 2015 - May 2016

- Improved understanding of course materials through weekly discussion sessions for 35+ undergraduates
- Provided individual suggestions and feedback during office hours in “Principal of CHBE”
- Advised 8 undergraduates for course projects “Principal of CHBE” and “Thermodynamics” by giving constructive and prompt feedback

**Internship, Chinwin Education Group, China** July 2013 - Aug 2013

- Personalized one-on-one Chemistry courses and tutored senior high school students to improve test scores

## SKILLS

Experienced with process modeling and optimization of chemical reactors and distillation columns
4+ years of experience with Aspen Plus®, Aspen Plus dynamics, Excel VBA, MATLAB and gPROMS
Advanced knowledge of linear and nonlinear optimization algorithms, optimal control, stochastic estimation

## ACTIVITIES AND HONORS

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|---|---|
| Graduate safety board member | 2019 - Present |
| American Institute of Chemical Engineers | 2017 - Present |
| Dr. Thomas F. Edgar Endowed Graduate Fellowship | 2016 – 2017 |
| James R. and Merle Fair Endowed Graduate Fellowship | 2016 – 2017 |
| Cum Laude and with High Distinction in the Curriculum | 2016 |
| R. J. Van Mynen Scholarship | 2015 - 2016 |
| Volunteer, Food Packaging Project | 2013 - 2014 |
| Dean's List | 2012 - 2015 |

## PUBLICATIONS

**Yan, L.**; Edgar, T.; Witt, P.; and Baldea, Dynamic intensification divided wall column separating ethylene glycol from water. In preparation.

**Yan, L.**; Edgar, T.; Witt, P.; and Baldea, A systematic approach to dynamically intensify ternary distillation processes. In preparation.

**Yan, L.**; Edgar, T.; and Baldea, M. Maximizing energy savings attainable by dynamic intensification of binary distillation. *STUDIA UBB CHEMIA*, **2019**, *64(2), Tom II*, 357-369.

**Yan, L.**; Edgar, T.; and Baldea, M. Dynamic process intensification of binary distillation via Periodic Operation. *Ind. Eng. Chem. Res.* **2019**, *58(15)*, 5830-5837.

**Yan, L.**; Edgar, T.; and Baldea, M. Dynamic process intensification of binary distillation based on output multiplicity. *AIChE J*, **2019**, *65*, 1162-1172.

Pan, Y.T.; **Yan, L.** et al. Chemically controlled surface compositions of Ag-Pt octahedral catalysts. *MRS Lett*. **2017**, *7*, 179-182.

Pan, Y.T.; **Yan, L.** et al. Regioselective Atomic Rearrangement of Ag-Pt Octahedral Catalysts by Chemical Vapor-Assisted Treatment. *Nano Lett.* **2016**, *16*, 7988-7992.

Liu, Y.; Norton, J.J.S.; Qazi, R.; Zou, Z.; Ammann, K.R.; Liu, H.; **Yan, L.** et al. Epidermal mechano-acoustic sensing electronics for cardiovascular diagnostics and human-machine interfaces. *Sci. Adv*. **2016**, *2(11)*.

Kim, J.; Salvatore, G.A.; Araki, H.; Chiarelli, A.M.; Xie, Z.; Banks, A.; Sheng, X.; Liu, Y.; Lee, J.H.; Jang, K.; Heo, S.Y.; Cho, K.; Luo, H.; Zimmerman, B.; Kim, J.; **Yan, L.** et al. Battery-free, stretchable optoelectronic systems for wireless optical characterization of the skin. *Sci. Adv*. **2016**, *2(8)*.

Lee, C.H.; Kang, S.K.; Salvatore, G.A.; Ma, Y.; Kim, B.H.; Jiang, Y.; Kim, J.S.; **Yan, L.** et al. Wireless Microfluidic Systems for Programmed, Functional Transformation of Transient Electronic Devices. *Adv. Funct. Mater*. **2015**, *25*, 5100-5106.

## PATENT

Baldea, M.; Edgar, T.; **Yan, L**, Distillation Methods, PCT/US19/37552

## SELECTED PRESENTATIONS

**Yan, L.**; Deneke, T.; Heljanko, K. Harjunkosky, I.; Witt, Paul,; Edgar, T.; and Baldea, Process Intensification of Ternary Distillation Using Dynamic Optimization Method and Data-Driven Approach. *AIChE Spring meeting*, **2020**, Virtual. (Oral)

**Yan, L.**; Edgar, T.; and Baldea, Dynamic intensification of ternary distillation columns. *AIChE Annual Meeting*, **2019**, Orlando, FL. (Oral and Poster)

**Yan, L.**; Edgar, T.; and Baldea, Dynamic Intensification of the Operation of Distillation Processes. *AIChE Spring meeting*, **2019**, New Orleans, LA. (Oral)