

# HUI TIAN

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## EDUCATION

- **Ph.D.** in Chemical and Biological Engineering, **2020**, University of British Columbia (UBC), Vancouver, BC, Canada
- **M.Sc.** in Control Science and Engineering, **2013**, Harbin Institute of Technology, China
- **B.Eng.** in Control Engineering, **2011**, Harbin Institute of Technology, China

## TEACHING EXPERIENCE

**Instructor**, Texas Tech University, Texas, USA 2022 – Present

- Teach the following courses: CHE3326-Heat Transfer, CHE3341-Mass Transfer, CHE3323-Chemical Reaction Engineering, CHE3322-Thermodynamics II, CHE4353-Process Control
- Develop syllabus, deliver lectures, host discussion sessions and office hours, design homework, projects, and exams, collaborate with other instructors on course delivery
- Assist the department with student recruitment and other service

**Graduate Teaching Assistant**, UBC, Canada 2014.09 – 2019.11

- CHBE 356, Process Dynamics and Control
  - Led the discussion sessions for the course (around 70 students each year)
  - Developed tutorial sessions based on practical projects to enhance students' ability in system modeling, control design, and computer programming
  - Held office hours to address students' questions and conducted review sessions to assist their understanding of the course
  - Graded homework assignments, projects, and exams
  - Topics covered: ODE dynamical models, Laplace transform, transfer function, PID control and tuning, time-domain and frequency-domain analysis, advanced control
- CHBE 244, Thermodynamics I
  - Led the discussion sessions for the course (around 120 students each year)
  - Designed and led tutorial sessions. Held office hours
  - Marked exams, assignments, tutorial reports and assisted instructor with exam designs
  - Topics covered: First and second law of thermodynamics, work, heat, and energy, entropy and reversibility, thermodynamics of process, classical thermodynamics, phase equilibrium, and stability

## RESEARCH EXPERIENCE

**University of British Columbia (UBC)**, Ph.D., Vancouver, BC 2013.09 – 2020.05

- Thesis: *Stochastic Multi-objective Economic Model Predictive Control of Two-stage High Consistency Mechanical Pulping Processes*
- Advisors: Prof. R. Bhushan Gopaluni & Prof. Victor M. Zavala
- Collected and analyze pulping mill plant response data; Applied nonlinear dynamic system identification techniques on integrated mechanical pulping systems to identify a nonlinear semi-empirical dynamic process model
- Proposed advanced model-based control and optimization techniques (linear/nonlinear model predictive controls (MPCs), multi-objective economic MPC, stochastic MPC, distributed MPC, etc.) for the nonlinear mechanical pulping and refining processes

- Developed real-time control and optimization and state estimators using Matlab/Simulink models, AMPL software, and IPOPT solver
- Analyzed and provided technical supports and control/optimization solutions for pulping mills to address complex problems
- Research focus: optimization, linear/nonlinear MPC, multi-objective economic MPC, stochastic optimization, system identification, data analytics, state estimator design

## PRESENTATIONS:

- Hui Tian. Moving horizon estimator design for mechanical pulping process, PACWEST Conference, AB, Canada, June 1, 2018
- Hui Tian. Control and estimation for integrated high and low consistency refining, The university of British Columbia, BC, Canada, March 24, 2017
- Hui Tian. Economic nonlinear model predictive control for mechanical pulping processes, Boston, MA, July 6, 2016
- Hui Tian. Multi-objective economic model predictive control and its application in mechanical pulping process, PACWEST, AB, Canada, June 10, 2016

## AWARDS

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| • International Tuition Award, UBC   | 2019.08 |
| • Best Presentation Award, PACWEST Conference                                | 2018.06 |
| • Thunderbird Chapter Outstanding Leadership Pin, UBC                        | 2015.06 |
| • Faculty of Applied Science Graduate Award, UBC                             | 2013.09 |
| • National Scholarship for Graduate Students, Ministry of Education of China | 2013.02 |
| • Scholarships for Excellent Graduate Students, HIT                          | 2012.10 |
| • Best Undergraduate Student, HIT  | 2011.05 |

## LEADERSHIPS AND VOLUNTEERS

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| <b>President</b> , Thunderbird Residence Association, UBC                  | 2014.05 – 2015.05 |
| • <i>Excellent Leadership Award</i> from UBC                               |                   |
| • Organized outreach and educational events for UBC students and residents |                   |
| • Chaired weekly steering committee meetings                               |                   |

## SELECTED PUBLICATIONS

- Hui Tian, J. Prakash, V. M. Zavala, J. A. Olson, and R. B. Gopaluni. A tractable approximation for stochastic MPC and application to mechanical pulping processes, *Computers & Chemical Engineering*, 141 (2020): 106977
- Hui Tian, R. B. Gopaluni, V. M. Zavala, J. A. Olson. An economic model predictive control framework for mechanical pulping processes, *Control Engineering Practice*, 85 (2019): 100-109
- Hui Tian, Q. Lu, R. B. Gopaluni, and V. M. Zavala. Multi-objective economic MPC of mechanical pulping processes, Proceedings of the 55<sup>th</sup> IEEE Conference on Decision and Control. Las Vegas, NV, USA, pp. 4040-4045, December 2016
- Hui Tian, Q. Lu, R. B. Gopaluni, V. M. Zavala, and J. A. Olson. Economic nonlinear model predictive control for mechanical pulping processes. Proceeding of the 2016 American Control Conference, Boston, MA, USA, pp. 1796-1801, July 2016