Gabriel David Patrón

Citizenship: Canadian, Colombian
Languages: English, Spanish
Modelling environments: GAMS, gPROMS, MATLAB, Python (Pyomo)

Department of Chemical Engineering, University of Waterloo
E6-3104, 259 Phillip St, Waterloo, ON, CA, N2L 3W8
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Education

Department of Chemical Engineering, University of Waterloo, CA *2018–*

PhD, Process Systems Engineering

- Supervisor: Luis Ricardez-Sandoval
- Topics: Moving horizon estimation (MHE), model predictive control (MPC), real-time optimization (RTO), post-combustion carbon capture (PCC), chemical looping combustion (CLC).

Department of Chemical Engineering, Imperial College London, UK *2017–2018*

MSc, Process Systems Engineering (Merit)

- Supervisor: Amparo Galindo
    - *An Application of Residual Entropy Scaling to Calculate and Predict Viscosity Using the SAFT-γ Mie Equation of State.*

Department of Chemical and Biomolecular Engineering, National University of Singapore, SG *2016*

Research exchange

- *Supervisors: Ning YAN, Jiaguang ZHANG (now at the University of Lincoln, UK)*
    - *Formic Acid-Mediated Pyrolysis of Woody Biomass.*

Department of Chemical Engineering and Applied Chemistry, University of Toronto, CA *2013–2017*

BASc, Chemical Engineering (Honours)

- Minor in sustainable energy.

Publications

Patron, G and Ricardez-Sandoval, L. (2022). An integrated real-time optimization, control, and estimation scheme for post-combustion CO_2 capture. Applied Energy, 308, 118302.

Patron, G and Ricardez-Sandoval, L. (2020). A robust nonlinear model predictive controller for a post-combustion CO_2 capture absorber unit. Fuel, 265, 116932.

Patron, G and Ricardez-Sandoval, L. (2020). Real-Time Optimization and Nonlinear Model Predictive Control for a Post-Combustion Carbon Capture Absorber. IFAC-PapersOnLine, 53(2), p. 11595–11600.

Conference presentations

Patron, G and Ricardez-Sandoval, L. (2020). Towards an integrated approach for real-time economic optimization, state estimation, and control for a post-combustion carbon capture absorber section. AICHE annual meeting 2020, 596c.

Patron, G and Ricardez-Sandoval, L. (2020). Real-Time Optimization and Nonlinear Model Predictive Control for a Post-Combustion Carbon Capture Absorber. 21st IFAC world congress, VI161-09.9

Awards and grants

Faculty of Engineering Domestic Doctoral Student Award 2018–2022
University of Waterloo

Graduate Research Studentship 2018–2022
University of Waterloo

Centre for International Experience Award 2016
University of Toronto

Cross-Disciplinary Program Summer Grant 2016
University of Toronto

University of Toronto Entrance Scholarship 2013
University of Toronto

Teaching and mentoring

Undergraduate teaching assistantship 2019, 2020

University of Waterloo, CHE420: Introduction to Process Control with Prof. Hector Budman

Undergraduate student supervision

University of Waterloo, final year design project: Design of a Chemical Looping Combustion Model for Reducing Carbon Footprint *2021*

University of Waterloo, final year design project: Modelling and Optimization of Chemical Looping Combustion (CLC) Process *2020*

Professional membership

American Institute of Chemical Engineers (AIChE) - *Graduate Student Member* *2022–*

Canadian Society for Chemical Engineering (CSChE) - *Graduate Student Member* *2022–*

International Federation of Automatic Control (IFAC) - *Affiliate Member* *2022–*

Professional service

Peer reviewer for:

The 13th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS) in Busan, Republic of Korea, June 14-17, 2022.

Industrial experience

EllisDon Corporation *2015*

M.E.I.T. Intern, New Oakville Trafalgar Memorial Hospital

- Worked with specialty teams - Mechanical, Electrical, and Information Technology - during the commissioning of the project.
- Performed calibration, testing, and troubleshooting for hospital communications and emergency systems - to meet strict hospital regulations and standards.
- Identified system deficiencies and liaised with subcontractors to find solutions.
- Modified drawings for hoarding permit applications using Autodesk.

EllisDon Corporation *2014*

Estimating Intern

- Was a part of the proposal team that formed an estimate for - and won - the Eglinton Light Rail Transit (ELRT) Project.
- Management of several project-specific tender packages, including assessment of requirements based on specifications, qualification process, management of quotes, quantity takeoffs, and estimates.

References available upon request