Paulina Quintanilla

✉ p.quintanilla@imperial.ac.uk   🖥 Personal website   in /in/paulinaquintanilla

Qualifications

PhD in Earth Science and Engineering   Nov 2022
Imperial College London   *London, United Kingdom*
Thesis: *Dynamic physics-based flotation models for effective predictive control*

MSc and BEng in Chemical Engineering   Jan 2017
Universidad Técnica Federico Santa María   *Valparaíso, Chile*
Thesis: *Analysis of the effect of pressure and porosity on diffusion-controlled leaching*

Work experience

Postdoctoral Researcher in Process Systems Engineering   Dec 2022 - now
Imperial College London   *London, United Kingdom*

Co-founder and Developer of Bubble Analyser   Jan 2021 – now
Independent project
- Bubble Analyser is the first open-source software for bubble size measurements using image analysis. More information on our website: www.bubbleanalyser.com

Guest Lecturer in Mining Geology and Engineering   Dec 2022
Imperial College London   *London, United Kingdom*
- Delivered theoretical and practical class in Mineral Processing and Flowsheet Design for the module "Mining Geology and Engineering".

Research Assistant in Froth Flotation   Nov 2022 - Dec 2022
Imperial College London   *London, United Kingdom*
- Part of the Fine Future project, funded by the EU, which aims at creating new scientific knowledge to enable the development of groundbreaking technologies to exploit fine particle fractions by froth flotation.

Graduate Teaching Assistant (GTA)   Feb 2019 – Oct 2022
Imperial College London   *London, United Kingdom*
- Courses: Data Science and Machine Learning with python, Mathematics for Geoscientists, Mining Geology and Engineering, Mineral Processing, Mining Water and Waste Management, Excel and Statistics workshop.
- Graduate Teaching Assistant coordinator.

Co-supervisor MSc student   Mar 2022 – Sept 2022
Imperial College London   *London, United Kingdom*
- Supervision of an MSc in Applied Computational Science student. Project: "Bubble Analyser - Identification and characterisation of bubbles using Machine Learning".

Guest Lecturer in Process Control and Statistics   Mar 2018 – Aug 2018
Universidad Técnica Federico Santa María   *Santiago, Chile*
- Courses: "Process control seminar" and "Analysis and Design of Industrial Experiments" (applied statistics).

Co-supervisor Chemical Engineering students   Mar 2018 – Aug 2018
Universidad Técnica Federico Santa María   *Santiago, Chile*
- Assisted and supervised two undergraduate students in their final projects for BEng in Chemical Engineering.

Research Assistant in Process Systems Engineering   Aug 2017 – Aug 2018
Universidad Técnica Federico Santa María   *Santiago, Chile*
- Project: "Including stochastic information in Real-Time Optimisation for process supervision".
- Set up and instrumented the Laboratory of Optimisation in the Department of Chemical Engineering.

Undergraduate Teaching Assistant (UTA) — Mar 2011 – Jun 2016

Universidad Técnica Federico Santa María — *Valparaíso, Chile*

- Modules: Transport Phenomena, Reactor Design, Mass Transfer, Statistical Design and Analysis of Industrial Experiments, Heat Transfer, General Physics III (waves theory, fluid mechanics and thermodynamics), Mathematics III (multivariable calculus, ODE, Laplace transform, Fourier series).

Awards & research grants

IChemE Global Awards 2022 - Young Researcher finalist — 2022

Institute of Chemical Engineers — *London, United Kingdom*

MEI Young Person's Award 2021 — 2022

Minerals Engineering International — *London, United Kingdom*

1st Place Best Poster Award — 2022

Society of Chemical Industry — *London, United Kingdom*

SCI Messel Scholarship 2020 — 2020

Society of Chemical Industry — *London, United Kingdom*

- Awarded one of the three annual SCI scholarships of £5,000 over two years to support my studies.

Mining Club Award — 2020

Institute of Materials, Minerals and Mining — *London, United Kingdom*

- Grant of £4,100 to perform experiments at Universidad Técnica Federico Santa María, Santiago, Chile.

Imperial College Trust bursary — 2019

Imperial College London — *London, United Kingdom*

- Grant of £350 to participate in the 18th IFAC MMM in Stellenbosch, South Africa.

IOM^3 Travel bursary — 2019

Institute of Materials, Minerals and Mining — *London, United Kingdom*

- Grant of £1,000 to participate in the 18th IFAC MMM in Stellenbosch, South Africa.

PhD Scholarship — 2018

National Research and Development Agency (ANID) — *Santiago, Chile*

- Full scholarship for PhD research abroad ($\sim$ £160,000).

Master's Scholarship — 2016

Universidad Técnica Federico Santa María — *Valparaíso, Chile*

- Full scholarship for MSc degree, including fees and living costs ($\sim$ £20,000).

Award to the Best Chemical Engineering Graduate — 2017

National Engineering College — *Valparaíso, Chile*

Award to the Best Chemical Engineering Graduate — 2017

Universidad Técnica Federico Santa María — *Valparaíso, Chile*

Honour list — 2012 – 2016

Universidad Técnica Federico Santa María — *Valparaíso, Chile*

- Recognition of outstanding academic achievement for the whole BEng programme.

RECENT ORAL PRESENTATIONS

- **Society of Chemical Industry - College of Scholars Day (invited)**, London, United Kingdom, November 2022. *Optimising mineral process systems.*

- **Towards Net Zero Seminars (invited)**, Department of Chemical Engineering, Imperial College London, London, United Kingdom, November 2022. *Optimising mineral process systems – The transition to green energy will need bubbles!*

- **Society of Chemical Industry - Annual General Meeting (invited)**, London, United Kingdom, July 2022. *Optimising mineral process systems – The transition to green energy will need bubbles!*

- **Imperial College ResearchFest! (invited)**, July 2022. *Optimising mineral process systems – The transition to green energy will need bubbles!*

- **Flotation 21'**, November 2021. *Development and validation of a dynamic flotation model for flotation predictive control incorporating froth physics.*

- **Society of Chemical Industry - College of Scholars Day (invited)**, November 2021. *Development and validation of a dynamic flotation model for flotation predictive control incorporating froth physics.*

- **Procemin - Geomet 2021**, October 2021. *Validation and implementation of a dynamic flotation model for predictive control including froth physics.*

- **Advances in the Digitalisation of the Process Industries**, IChemE, October 2021. *Development and validation of a dynamic model for flotation predictive control incorporating froth physics.*

- **International Conference in Raw Materials and Circular Economy**, Athens, Greece, September 2021. *Development and validation of a dynamic flotation model for flotation predictive control incorporating froth physics.*

- **Webinar series with Technical University Munich's (TUM) 'Chemical Process Engineering Lab'**, November 2020. *Developing flotation dynamic models for predictive control.*

- **Society of Chemical Industry - College of Scholars Day (invited)**, November 2020. *Development and validation of a dynamic flotation model for flotation predictive control incorporating froth physics.*

- **International Federation of Automatic Control Conference - Mining, Mineral and Metal Processing**, Stellenbosch, South Africa, August 2019. *Dynamic physics-based flotation models for effective predictive control: State-of-the-art.*

RECENT OUTREACH & VOLUNTEER EXPERIENCE

Postdoc Committee - Social media and newsletter rep **Jan 2023 - now**
DEPARTMENT OF CHEMICAL ENGINEERING, IMPERIAL COLLEGE LONDON *London, United Kingdom*

Meeting coordinator and newsletter editor **Jan 2021 - now**
INSTITUTE OF CHEMICAL ENGINEERS (IChemE) *London, United Kingdom*

Speaker in Inspiring Chemical Engineering – How to stand out **Feb 2023**
INSTITUTE OF CHEMICAL ENGINEERS (IChemE) *London, United Kingdom*

STEM for Britain finalist 2022 – **Engineering category.** **March 2022**
HOUSES OF PARLIAMENT *London, United Kingdom*

Ambassador of SCI **2020-2022**
SOCIETY OF CHEMICAL INDUSTRY (SCI) *London, United Kingdom*

ADDITIONAL SKILLS & EXTRA INFORMATION

- **Languages**: English: Full professional proficiency, Spanish: Native proficiency
- **Computer skills**: Matlab (including GUI), Python (including Pyomo, Scikit-learn, Seaborn, Pandas), CasADi, GitHub/GitLab, InTouch Wonderware, Inkscape, LaTeX.
- **Nationalities**: Chilean and Spanish.
- **PhD supervisors**: Dr Pablo Brito-Parada (✉), Prof Stephen Neethling (✉), and Dr Daniel Navia (✉).

LIST OF PUBLICATIONS

I am the corresponding author of all my papers, except numbers (7) and (9).

Scientific peer-reviewed journals

- (1) Quintanilla P, Navia D, Neethling S.J., Brito-Parada P.R. (2023). Economic model predictive control for a rougher froth flotation cell using orthogonal collocations, Minerals Engineering, Vol: 196, 108050. DOI:/10.1016/j.mineng.2023.108050.

- (2) Quintanilla P, Navia D, Moreno F, Neethling S.J., Brito-Parada P.R. (2023). A methodology to implement a closed-loop feedback-feedforward level control in a laboratory-scale flotation bank using peristaltic pumps, MethodsX, Vol: 10, 102081. DOI:/10.1016/j.mex.2023.102081.

- (3) Quintanilla P, Mesa D. Reyes F. (2022). Bubble Analyser — An open-source software for bubble size measurement using image analysis, Minerals Engineering, Vol: 180, 107497. DOI:/10.1016/j.mineng.2022.107497.

- (4) Quintanilla P, Neethling SJ, Mesa D, Navia D and Brito-Parada PR. (2021). A dynamic flotation model for predictive control incorporating froth physics. Part II: Model calibration and validation, Minerals Engineering, Vol: 173, 107190. DOI: /10.1016/j.mineng.2021.107190 .

- (5) Quintanilla P, Neethling SJ, Navia D and Brito-Parada PR.(2021). A dynamic flotation model for predictive control incorporating froth physics. Part I: Model development, Minerals Engineering, Vol: 173, 107192. DOI:/10.1016/j.mineng.2021.107192.

- (6) Quintanilla P, Neethling SJ and Brito-Parada PR. (2021). Modelling for froth flotation control: A review, Minerals Engineering, Vol: 162, 106718. DOI: /10.1016/j.mineng.2020.106718.

- (7) Navia D, Puen A, Quintanilla P, Briceño L, Bergh L. (2019). On dealing with measured disturbances in the modifier adaptation method for real-time optimization, Computers & Chemical Engineering, Vol: 128, Pages: 141-163. DOI:/10.1016/j.compchemeng.2019.06.004.

Conference proceedings

- (8) Quintanilla P, Neethling S.J., Brito-Parada P.R. (2021). Development and Validation of a Dynamic Model for Flotation Predictive Control Incorporating Froth Physics, Materials Proceeding, Vol: 5, no. 1:13. DOI:/10.3390/materproc2021005013.

- (9) Navia D, Puen A, Quintanilla P, Bergh L, Briceño L, de Prada C. (2018). A Proposal to Include the Information of Disturbances in Modifier Adaptation Methodology for Real Time Optimization, Computer Aided Chemical Engineering Vol: 43, Pages 1081-1086. DOI:/10.1016/B978-0-444-64235-6.50189-3.