ED BARRY

@ ed.barry@netc.fr ✆ 0481 320 570 📍 Brisbane, AUS in edmbarry ⌕ edmbarry 🎓 Publications

Adaptable chemical and computational engineer with expertise in process modelling, data science and engineering, scientific computing, high performance computing, laboratory skills, and machine learning.

EXPERIENCE

Computational Modeller

Advanced Water Management Centre Trojan Technologies

📅 Apr 2015 – present 📍 Brisbane, AUS & London, CAN

- *Rationale*: To replace expensive physical prototyping with computational models when scaling up bioreactors.
- Developed open source partial differential equation models to simulate fluids and biochemistry.
- Deployed models using Linux containers on high performance computing infrastructure.
- Post-processed data-rich simulation results for 8 papers, technical reports and 3 conferences.
- Developed scientific libraries in C++ for coupling radiation and biology to model photosynthesis at Trojan Technologies in London, Canada.

Software Instructor

The Carpentries Organization

📅 Apr 2018 – present 📍 Worldwide

- Designed and taught computational thinking, data analysis and software techniques to industry professionals using Python for data science, shell for automation, and git for version control.
- Improved my data and statistical workflow efficiencies and those of course attendees based on their feedback.

Research Scientist

Advanced Water Management Centre

📅 Nov 2019 – Mar 2020 📍 Brisbane, AUS

- Designed and ran experiments on a novel glass recycling process.
- Discovered analysis technique based on coffee science. Improved waiting times for results from days to minutes.
- Analysed experimental results with ANOVA, Markov chain Monte Carlo, linear and nonlinear regression. Estimated kinetic and operating parameters.

Scientific Officer

Queensland Department of Environment and Science

📅 Apr 2019 – Sep 2020 📍 Brisbane, AUS

- Prepared a report into the state of leading wastewater treatment practice in the Great Barrier Reef catchment.
- Conducted interviews, and analysed monitoring and survey data to gain qualitative and quantitative insights.
- Recommended operation practices across a range of treatment plant sizes with a view to minimise nutrient discharge into the Great Barrier Reef.

Laboratory Research Assistant

Advanced Water Management Centre

📅 Nov 2013 – Apr 2015 📍 Brisbane, AUS

- Operated laboratory- and pilot-scale bioreactors.
- Designed batch experiments and carried out chemical analysis.

EDUCATION

PhD in Chemical Engineering

University of Queensland
Trojan Technologies

📅 Apr 2015 – Nov 2019

Title: ***Distributed parameter modelling of phototrophic bioreactor systems.***

- Modelled the growth of bacteria used in biotechnology taking into account biochemical processes, fluid flows, and electromagnetic radiation in bioreactors.
- Used the finite volume method to solve the partial differential equations.
- Improved estimate accuracy by including spatial variations compared with lumped-parameter modelling.
- Published in *Water Research* and project was presented in Canada, Cuba and Switzerland.

BE in Chemical Engineering (Hons)

University of Queensland

📅 Mar 2009 – Nov 2014

- Studied a diverse range of general engineering courses during an exchange programme at École Centrale Paris.

COMPUTING SKILLS

Python, Julia, Matlab	●●●●●
MS Office	●●●●●
Linux, Unix, Containers	●●●●○
Latex, Markdown	●●●●○
Git, SQL	●●●●○
PyTorch, Tensorflow, Spark	●●●○○
C, C++, Rust	●●●○○
R, Fortran	●●○○○

TECHNICAL SKILLS

Differential Equations

Computational Modelling Simulation

Deep Learning Regression

Classification Bayesian Inference

Time Series Probabilistic Programming

Markov Chain Monte Carlo

Data Wrangling

CERTIFICATES

Epidemics - the Dynamics of Infectious Diseases
Penn State University

📅 Mar 2020   📍 Online (Coursera)

Julia Scientific Programming
University of Cape Town

📅 Mar 2020   📍 Online (Coursera)

Machine Learning with Python
IBM

📅 Mar 2020   📍 Online (Coursera)

TEACHING & SUPERVISION

Research Supervisor
Advanced Water Management Centre

📅 Nov 2019 – Mar 2020   📍 Brisbane, AUS

– Supervised and mentored Master's student for their summer research project.
– Initiated student on experimental design, laboratory techniques and safety, chemical analysis and statistical analysis.

Lecturer - Wastewater Modelling and Control
UQ Chemical Engineering

📅 Jun 2019 – Nov 2019   📍 Brisbane, AUS

– Coordinated course on principles of biological wastewater treatment, common industry models, numerical methods, uncertainty analysis and propagation, continuous and discrete control strategies, and scientific computing.

Guest Speaker
UQ Chemical Engineering
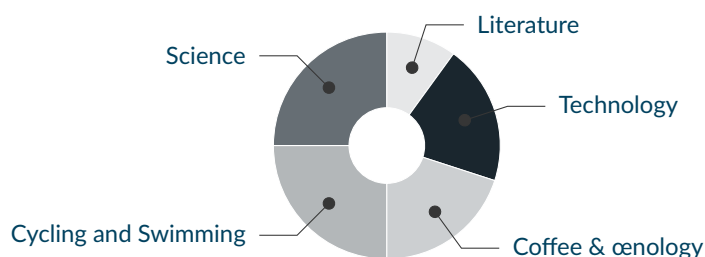
📅 Jun 2019 – Nov 2019   📍 Brisbane, AUS

– Delivered lecture and workshop on analytical and numerical propagation of uncertainty in models.
– Ran workshop on modelling and data science workflows using RStudio, Jupyter notebooks, and git.

AWARDS

Sporting

2019	Australian Champion, Underwater Rugby
2003-2007	Australian Medallist, Swimming

INTERESTS

VOLUNTEERING

Rugby Coaching
Anglican Church Grammar School

📅 Apr 2018 – Sep 2019

- Coached the U13 C and D teams.
- Ran twice-weekly training sessions and Saturday game days.

Laboratory coordinator
Advanced Water Management Centre

📅 Feb 2014 – May 2018

- Maintained good workplace health and safety culture for >20 lab users.
- Managed stocks of consumables and supplies.
- Organised maintenance and cleaning schedules.

SOFT SKILLS

Learning Potential · Team Work · Responsibility · Work Ethic · Professionalism · Vim Master

LANGUAGES

English ●●●●●
French ●●●●●
German ●●●○○

REFERENCES

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