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 batch 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

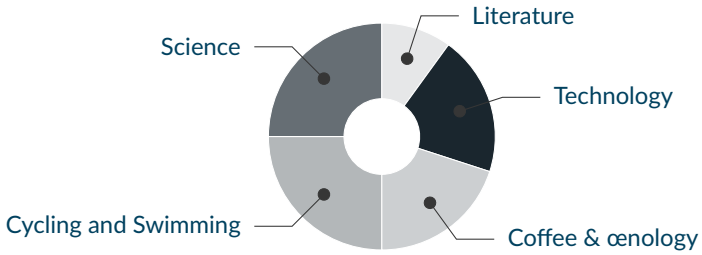
- Delivered lecture and workshop on analytical and numerical propagation of uncertainty in models.
- Ran workshop on modelling and data science workflows using RStudio, Jupyter notebooks, and Git.

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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