

# Rob Hoelzle, PhD

## Data Scientist and Engineer

Results-driven end-to-end data scientist with 8 years' experience in big data analytics, 13 years' experience in high paced R&D environment, and a life-long passion for finding creative solutions to complex problems. Proficient in **Python**, **R**, and **SQL** for database construction, data mining, statistical analysis, visualization, and various machine learning models.

## Skills & Techniques

### Languages & Libraries

**Python** • SKLearn, SciPy, Folium, DB-APIs, SQLAlchemy, PyODBC, RegEx, BeautifulSoup, Dash, Matplotlib, Plotly, Seaborn  
**R** • Vegan, NBCLust, RCy3, RStatix, mvabund, lsmeans, dplyr, tidyr, spaa, SpiecEasi, ggplot, sciplot, corrplot, igraph, stringr  
**SQL** • MS Server, Lite, Transact • **Bash** • **C++**

### Modeling & Statistics

Linear/Non-Linear/Logistic Regression • Monte Carlo • K-Means Clustering • Hierarchical Clustering • KNN • Decision Trees • Support Vector Machines • Network Analysis • Dimensional Reduction • Ordination • Multivariate Statistics • ANOVA • PERMANOVA • T-test • Z-test • Chi-square Test

### Tools

[GitHub](#) • Power BI • VS Code • Jupyter Notebook • R Studio • Adobe Suite • M365 Suite

### Cloud & Systems

IBM Watson Studio • IBM DB2 • Galaxy Australia • Linux HPCs

### Professional

Database Design & Management • Data Pipeline Automation • Machine Learning • Statistical Validation • Research & Analysis • Creative Problem Solving • Technical Writing & Communication • Project Management • Strategic Planning • Teamwork & Coordination • Leadership • Consulting

## Professional Experience

### Senior Quantitative Analyst

*Jan 2023 – Present*

Clean Energy Transfer Fund Pty Ltd, Brisbane, Queensland, Australia

- **Python, SQL, Power BI, Regression, Monte Carlo, Clustering, Statistical Validation**
- Develop and deploy financial, energy, and weather models to inform investment and portfolio management decisions for Australian wind, solar, and BESS PPAs, as well as weather and energy derivatives
- Design, build, and maintain automated SQL databases using extract-transform-load (ETL) pipelines for energy (AEMO & client meter), trading and futures (ASX, Bloomberg, & others), and weather (BOM & ERA5) data
- Provide market research, analysis, and insights through automated dashboards and detailed bespoke reporting to support the energy trading, finance, and executive leadership teams
- Developed interactive Power BI new asset discovery tool using a **Python** back-end to analyze the historical market and generation performance of all Australian wind, solar, and battery farms, model a market PPA price range, and forecast the resulting short, medium, and long-term impact on CETF's total portfolio under various risk scenarios
- Created Python and R-based tools used by the trading, finance, and analytics teams for standardized data collation, basic modelling, and performance metric reporting
- Deployed live product performance models for clients to support deal origination and negotiation for PPAs and weather hedges using client and market data

### Data Scientist (Bioinformatics) – Team Lead

*Sep 2021 – Dec 2022*

### Data Scientist (Bioinformatics)

*Aug 2016 – Aug 2021*

The University of Queensland (Faculty of Science), Brisbane, Queensland, Australia

- **Python, R, SQL, Bash, Dimensional Reduction, Regression, Clustering, Classification, Statistical Validation**
- Automated data collection and modeled complex interactions between highly diverse genomic, environmental, agricultural, immunological, mining, electrochemical, and environmental engineering data in **Python, R, SQL**, and **Bash**
- Mentored and coached professional and student researchers on experimental design, data management and processing, predictive modeling, and statistical validation. Included running code reviews and workshops
- Forecast greenhouse gas emissions from thawing arctic permafrost using **k-means clustering**, **PERMANOVA**, and **multivariate regression** on environmental, genomic, and protein expression datasets
- Identified source of groundwater cyanide for industry client using **dimensional reduction**, **KNN classification**, and **PERMANOVA** on genomic and environmental datasets
- Identified probiotic bacteria for an industry client using **dimensional reduction**, **multivariate regression**, **k-means clustering**, and **PERMANOVA** on immunological and genomic datasets

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**Bioprocess Engineer**

Jun 2012 – Jul 2016

The University of Queensland (Advanced Water Management Centre), Brisbane, Queensland, Australia

- **R, C++, Bash, Dimensional Reduction, Regression, Statistical Validation**
- Automated experimental controls and data collection of lab-scale custom-built bioreactors in **C++**
- Processed, modelled, and statistically validated large, multivariate datasets to validate carbon biorecycling to bioplastics process, using **dimensional reduction**, **PERMANOVA**, and **multivariate regression**
- Coordinated with research team to design experiments and communicate findings in peer-review publications

**Bioprocess Engineer**

Jun 2010 – Mar 2012

Green Biologics Ltd, Columbus, Ohio, USA

- **C++, Excel, Regression, Statistical Validation**
- Automated experimental controls and data collection of lab and pilot-scale custom-built bioreactors in **C++**
- Designed successful commercial biofuel reactor by modelling collected data using **regression** modelling and **ANOVA**
- Coordinated lab certification by US National Renewable Energy Laboratory for pilot reactor research facility

**Education & Certificates****PhD**, Bioprocess and Chemical Engineering, The University of Queensland

2017

Thesis: *Metabolic mechanisms and regulation of mixed culture fermentation***BSc w/ Hons**, Bioprocess Engineering, The Ohio State University

2010

Hons Thesis: *Genetic improvement of Clostridium tyrobutyricum for butanol production by insertion of adhE from Clostridium acetobutylicum***Professional Certificate**, Data Science, IBM

2022

**Community Engagement****Data Science Blog on Medium**: [medium.com/@RDHoelzle](https://medium.com/@RDHoelzle)

2022 – Present

Personal blog for publishing data science projects and how-to articles

**Mental Health Working Group**, UQ Sch of Earth & Environmental Sci: Mentorship Committee

2020 – 2022

Developed school-wide mental health, wellness, and mentorship programs

**Joint Academic Microbiology Seminars (JAMS)**: Organizing Committee

2018 – 2022

SE Queensland university and industrial microbiology networking and seminar series

**March for Science, Brisbane**: Organizing Committee

2017

Coordinated international demonstration promoting scientific and data-driven governmental policies

**Engineers Without Borders**: UQ Institute Engagement Committee

2015 – 2016

UQ research and student engagement arm of international engineering aid organization

**Top Peer-Reviewed Publications***Genome-resolved metagenomics of milk microbiomes reveals the influence of maternal dietary fiber on neonatal inheritance of immunoregulatory traits.* First author. **Research Square** (2023)*Maternal diet modulates the infant microbiome and intestinal Flt3L necessary for dendritic cell development and immunity to respiratory infection.* Contributing author. **Immunity** (2023)*Electro-fermentation: sustainable bioproductions steered by electricity.* Second author. **Biotechnology Advances** (2022)*Substrate availability drives mixed culture fermentation of glucose to lactate at steady state.* First author. **Biotechnology & Bioengineering** (2021)*Genome-centric view of carbon processing in thawing permafrost.* Contributing author. **Nature** (2018)*Influence of pH regulation mode in glucose fermentation on product selection and process stability.* Contributing author. **Microorganisms** (2016)*Regulation mechanisms in mixed and pure culture microbial fermentation.* First author. **Biotechnology & Bioengineering** (2014)**Personal Interests**

Rock Climbing • Ultimate Frisbee • Home Brewing • Escape Rooms • Photography • Gardening

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