

# Robert Hoelzle, PhD

## Data Scientist

Results-driven data scientist and bioinformatician with 6 years' experience in big data analytics, 11 years' experience in high paced R&D environment, and a life-long passion for problem solving. Proficient in **Python**, **R**, and **Bash** for data extraction/transformation/analysis, multivariate modeling and statistics, and visualization.

## Skills & Techniques

<b>Languages</b>	<u>Python</u> • SKLearn, SciPy, Pandas, NumPy, BeautifulSoup, FuzzyWuzzy, Dash, Matplotlib, Plotly, Seaborn, Folium <u>R</u> • Vegan, NBCLust, RCy3, RStatix, mvabund, lsmeans, spa, dplyr, tidyr, SpieEasi, ggplot, sciplot, corplot, igraph <u>Bash</u> • <u>T-SQL</u> • <u>SQLite</u> • <u>C++</u>
<b>Modeling &amp; Statistics</b>	Predictive modeling • Generalized linear models • Ordination • Clustering • Network analysis • Model validation • Multivariate statistics • Linear & polynomial regression
<b>Cloud &amp; Infrastructure</b>	IBM Watson Studio • IBM DB2 • Galaxy Australia • Linux architecture
<b>Tools</b>	GitHub • Atom • Spyder • Jupyter Notebook • R Studio • Adobe Suite • MS Office Suite
<b>Professional</b>	Creative problem solving • Technical writing & communication • Project management • Team coordination • Leadership • Teamwork • Research & analysis • Strategic planning • Consulting • Engineering • Budget management

## Experience

### Senior Data Scientist (Bioinformatics)

*Sep 2021 – Present*

### Data Scientist (Bioinformatics)

*Aug 2016 – Aug 2021*

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

- Published 4 peer-reviewed publications (+3 in review) which develop data-driven insights from integrated genomic, proteomic, and environmental datasets in **Python**, **R**, and **Bash**
- Delivered microbiology data-driven solutions to biotech industry stakeholders by developing **multivariate regression** and **general linearized models** in **R** on consulting projects for groundwater quality monitoring, soil carbon sequestration, and copper bioleaching
- Slashed research group's processing time for genomic data by 60% through custom built **Python** bioinformatic programs for manipulating and extracting genomic data
- Supervised eight research students, and mentored four research professionals, providing guidance for coding and data analysis in **Python**, **R**, and **Bash**
- Coordinated cross-institutional research collaborations, including synthesizing technical information between such diverse disciplines as microbiology, immunology, mining, and electrochemistry
- Awarded and managed \$6M+ in fellowships, research grants, and strategic funding through competitive national and international funding schemes

### Bioprocess Engineer

*Jun 2012 – Jul 2016*

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

- Discovered and published novel bioplastic production method (+2 additional publications) by integrating complex genomic, proteomic, and environmental datasets in **R** and **Bash**
- Developed custom bioreactor control systems in **C++** for experimental bioplastics and wastewater which automated conditions such as nutrient supply, temperature, and pH

### Bioprocess Engineer

*Jun 2010 – Mar 2012*

Green Biologics Ltd, Columbus, Ohio, USA

- Developed custom bioreactor control systems in **C++** for pilot and demonstration scale biofuel reactors, resulting in a commercially operating biofuel plant
- Coordinated lab certification by US National Renewable Energy Laboratory for pilot reactor research facility
- Supervised two research assistants for pilot and demonstration scale reactor development

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## 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

- Mental Health Working Group: UQ School of Earth & Environmental Sciences** 2020 – Present  
Mentorship and Activities Committees: Working group to develop and implement positive mental health programs within the School of Earth & Environmental Sciences, including a mentorship program for early career researchers, networking events, and lunch and sporting activities.
- Joint Academic Microbiology Seminars (JAMS)** 2018 – Present  
Brisbane Organizing Committee: Bimonthly networking and seminar series aimed at developing collaboration between academic, industry, and medical microbiologists across Southeast Queensland.
- March for Science: Brisbane** 2017  
Organizing Committee: Coordinated international demonstration calling for increased scientific and data-driven governmental policy making, especially on issues of climate change and public health.
- Engineers Without Borders** 2015 – 2016  
UQ Institute Engagement Committee: International engineering aid organization. The UQ Institute Engagement program aligned PhD candidates with UQ researchers working on infrastructure projects for developing nations, especially low-maintenance wastewater and drinking water facilities.
- Navigating the Realities of a Diverse Engineering Workplace: UQ School of Chemical Engineering** 2015  
Organizing Committee: Panel Q&A session on workplace culture in professional engineering, with a focus on diversity of race and gender identity. The panel consisted of a highly diverse range of early, mid, and late career engineering professionals, and facilitated networking between engineering students and professionals.

## Top Publications

- Substrate availability drives mixed culture fermentation of glucose to lactate at steady state.* RD Hoelzle, D Puyol, B Viridis, D Batstone. **Biotechnology and Bioengineering** (2021)
- A facile method to enhance the performance of soil bioelectrochemical systems using in situ reduced graphene oxide.* C Camedda, RD Hoelzle, A Carucci, S Milia, and B Viridis. **Electrochimica Acta** (2019)
- Genome-centric view of carbon processing in thawing permafrost.* BJ Woodcroft, CM Singleton, JA Boyd, PN Evans, JB Emerson, AAF Zayed, RD Hoelzle, TO Lamberton, CK McCalley, SB Hodgkins, RM Wilson, SO Purvine, CD Nicora, C Li, S Frolking, JP Chanton, PM Crill, SR Saleska, VI Rich, GW Tyson. **Nature** (2018)
- Influence of pH regulation mode in glucose fermentation on product selection and process stability.* Z Mohd-Zaki, JR Bastidas-Oyanedel, Y Lu, R Hoelzle, S Pratt, FR Slater, and DJ Batstone. **Microorganisms** (2016)
- Regulation mechanisms in mixed and pure culture microbial fermentation.* RD Hoelzle, B Viridis, and DJ Batstone. **Biotechnology and Bioengineering** (2014)

## Personal Interests

Rock climbing • Ultimate frisbee • Home brewing • Escape rooms • Photography • Gardening