

Event metadata

Event title	WORKSHOP: Machine learning in the life sciences
Event type	Workshop
Date of event	11 June 2024
Time of event	11am - 3pm AEST
Topic description	<p>Machine learning promises to revolutionise life science research by speeding up data analysis, enabling prediction of biological patterns and modelling complex biological systems.</p> <p>But what exactly is machine learning and when should you use it?</p> <p>This hands-on online workshop provides a high-level introduction to machine learning: what it is, its advantages and disadvantages compared to traditional modelling approaches and the types of scenarios where it may be the right tool for the job.</p> <p>Using example datasets and basic machine learning pipelines we contrast a few commonly used algorithms for constructing predictive models and explore some of their trade-offs. We discuss common pitfalls in how machine learning is applied and evaluated, with a focus on its application in the life sciences, to help you recognise overly optimistic results. We discuss how and why such errors arise and strategies to avoid them.</p>
Format description	<p>Workshop, online via Zoom.</p> <p>Dr Benjamin Goudey led the training by introducing key concepts and demonstrating the steps involved in the analysis. Participants then completed code along exercises giving them a chance to apply these skills with support from facilitators.</p> <p>Facilitators provided assistance troubleshooting code and answering questions. For the online version of the workshop this support was provided via Slack in parallel to the main session</p> <p>The workshop followed the Google Colab notebook linked in the 'Related work' section.</p> <p>A breakdown of timings and topics is provided in the schedule.</p> <p>Participation was free but subject to application with selection. Applications were reviewed by the organising committee.</p>
Identifier(s)/URL	biocommons.org.au/events/machine-learning

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Keywords	Bioinformatics http://edamontology.org/topic_0091 Analysis http://edamontology.org/operation_2945 Machine Learning http://edamontology.org/topic_3474
Contact	training@biocommons.org.au
Audience	This workshop is for Australian researchers who want to know more about machine learning and who are considering using it as part of their projects. You must be associated with an Australian organisation for your application to be considered.
Prerequisites	This workshop assumes some familiarity with R. You do not need to be an expert but you should be able to set up directories, run commands, read in and output files and be familiar with the “tidyverse” collection of packages. Code will be provided in a Google Colab Notebook. The expectation is that you follow along rather than write this code from scratch.
Technical requirements	<ul style="list-style-type: none"> • Slack was used to facilitate discussions. • Access to the internet, speakers, a webcam, microphone and Zoom. • Google Colab was used to provide computational resources for the included exercises.
Learning outcomes	<p>By the end of the workshop you should be able to:</p> <ul style="list-style-type: none"> • Give a high-level description of what machine learning is and what it can do • Explain the basics of evaluating supervised machine learning models • Recognise when evaluation of machine learning models is optimistically biased • Outline types of models and metrics • Explore and extend some R code for implementing machine learning pipelines <p>What you will not learn:</p> <ul style="list-style-type: none"> • Detailed knowledge of algorithms underpinning machine learning models • Anything that is not supervised (reinforcement learning, unsupervised learning) • How to run the latest and greatest deep-learning/AI models • Details around data cleaning, engineering, organisation
Lead Trainers	Dr Benjamin Goudey, Research Fellow, Florey Department of Neuroscience and Mental Health

Facilitators	<p>Dr Erin Graham, Queensland Cyber Infrastructure Foundation (QCIF) / James Cook University</p> <p>William Pinzon Perez, Queensland Cyber Infrastructure Foundation (QCIF)</p> <p>Dr Giorgia Mori, Sydney Informatics Hub, University of Sydney</p> <p>Joseph McConnell, University of Adelaide</p> <p>Jessica Chung, Melbourne Bioinformatics</p>
Training materials	<p>Shared in this Zenodo record:</p> <p>Shared elsewhere:</p> <p>Google Colab notebook: https://github.com/bwgoudey/IntroMLforLifeScienceWorkshopR</p>