

NITheCS COLLOQUIUM: Quantum machine learning with parameterized quantum circuits

Ryan Sweke (IBM Research)

Monday, 18 September 2023 | 16h00 – 17h00 SAST

Venue: in person* and online

* *Neelsie Cinema, Stellenbosch University*

--- Cheese and wine will be served at the venue ---

ABSTRACT

Quantum machine learning (QML) is one of the most explored applications of near-term quantum devices. In particular, much focus has been put on variational QML where parameterized quantum circuits (PQCs) are used as learning models, analogously to neural networks in the classical setting. However, despite this intense focus, it is still unclear to what extent variational QML can offer any meaningful advantages over state-of-the-art classical methods.

In this talk I will give an introduction to PQC based variational QML, with a strong focus on the mathematical structure of PQC models. I will then show how one can use this rich structure to (a) derive generalisation bounds for variational QML, and (b) to construct efficient classical learning algorithms which are guaranteed to match the performance of variational QML for certain learning tasks.

BIOGRAPHY

Since 2022, Ryan Sweke has been a Research Scientist in the Quantum Computational Sciences research group at IBM Research, with a broad set of interests at the intersection of theoretical computer science, machine learning and many-body physics.

Before joining IBM, Ryan spent five years as a post-doctoral fellow at the Freie-Universität Berlin in Germany. He received his Ph.D. from the University of KwaZulu-Natal.



REGISTER TO ATTEND

Visit <https://ury1.com/Qo24W>
or scan/click:



SUBSCRIBE TO THE NITheCS MAILING LIST:

