QUANTUM AI

Leiden Institute of Physics

who we are: physicists who collaborate with computer scientists and chemists to explore the promise of quantum technology for machine learning, drug design, and simulation of materials.

Carlo Beenakker: quantum transport and nanotechnology

Thomas O'Brien: quantum algorithms and quantum error correction

Collaborators:

Francesco Buda (LIC Leiden) Vedran Dunjko (LIACS Leiden) Lucas Visscher (VU Amsterdam) Leonardo DiCarlo (QuTech/TUDelft) Lieven Vandersypen (QuTech/TUDelft) Barbara Terhal (QuTech/TUDelft) Detlef Hohl (Shell)

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what we do: we develop algorithms that we test on small quantum computers at QuTech in Delft; the first quantum computers are already here!

dual-track approach:

- top-down development, costing and simulation of future algorithms
- bottom-up development of small scale experiments on current devices





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what we can contribute to SAILS:

- explore opportunities to accelerate machine learning calculations using the massive parallelism of a quantum computation
- identify targets in chemistry and drug design that can benefit from quantum computational power
- help non-physicists develop intuition for the quantum world (entanglement, superposition, teleportation, ...)







