Use Cases

December 2022 – December 2024

QuantumBasel has made significant progress in various areas over the past two years. With the vision of democratizing access to quantum computing in mind, QuantumBasel works with start-ups, large companies and universities. The interplay between quantum computing and AI shows how both technologies can benefit from each other and jointly create new opportunities for research and concrete applications. Thanks to the unique capabilities of quantum computers, machine learning models can achieve greater accuracy and at the same time be trained more efficiently - be it in terms of the time required, the quantity and quality of input data or energy efficiency.
In addition, classical machine learning is used to optimize the methods of the quantum computer. Machine learning methods help to better understand the behavior of noise in quantum processors and to eliminate errors in a targeted manner.

QuantumBasel's projects are often subject to secrecy, but it is now possible to name at least some of the use cases.

Vinci Energies is using quantum optimization for air conditioning technology, while a **major Swiss bank** is exploring quantum applications for financial services. **Hermes** is looking at ways to improve the efficiency of its delivery service with quantum technologies. **ARTIDIS** is exploring QML in areas such as nanotechnology and **Pfizer** is researching optimization applications in the pharmaceutical industry.

CGC uses specially trained Large Language Models (LLMs) to analyze gene mutations of tumors to identify the best possible treatment strategy, **Merian Iselin Clinic** uses self-generated LLMs to diagnose patients in the emergency room as part of a proof-of-concept, while **Moonlight AI** uses quantum machine learning (QML) in computational pathology.

KIPU develops hardware/application-specific quantum algorithms, while **Commutator Studios** creates quantum software for modeling applications such as the corrosion of materials.

In science and research, the **ZHAW** is doing pioneering work with QML and the **FHNW** is researching the application of quantum-based NMR data analysis for molecular modeling.

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VINCI ENERGIES	HVAC quantum optimization (air conditioning technology)
SWISS BANK	Quantum applications in financial services
HERMES	Quantum-enhanced delivery efficiency
ARTIDIS	QML in nanotechnology
PFIZER	Optimization applications in pharmacy
CGC	LLMs for genomic reports
MERIAN ISELIN	Fine-tuned LLMs for emergency wards
MOONLIGHT AI	QML in pathology
KIPU	Hardware-specific quantum alogrithms
COMMUTATOR STUDIOS	Quantum software, e.g., for quantum chemistry
FHNW	Quantum-based NMR data analysis for molecular modeling
ZHAW	«Quantum machine learning» (QML)