

## Relevance between Superintelligence and Quantum Computing

Since there is very little reference to quantum computing in the literature on AI and evolving Superintelligence, I wanted to gain more insight using chatGPT as assistant.

As the editor of this article, I posed the following question of the relevance between quantum computing and AI:

**Are there any synergies between AI, Superintelligence and Quantum computing?  
Is there any literature on this subject?**

**ChatGPT said:**

Short answer: **Yes — there are real, concrete synergies between AI (especially machine learning), efforts toward superintelligence/AGI, and quantum computing — but they're mixed: promising algorithmic and simulation advantages exist, yet major theoretical and practical limits mean quantum tech is *unlikely* to magically create hyperintelligence on its own.** Below I summarize the main synergy pathways, the caveats, and give a short, up-to-date reading list you can use to dive deeper.

### How they can help each other — main synergy pathways

1. **Quantum machine learning (QML) algorithms that could speed up core ML primitives.**  
Examples: quantum kernels, quantum linear-algebra subroutines and quantum subroutines for optimization and sampling that — in some settings — offer asymptotic or empirical speedups for training/classification/regression. [arXiv+1](#)
2. **Better optimization and combinatorial search.**  
Quantum heuristics (variational quantum algorithms, QAOA-type approaches) may help solve certain NP-hard or hard optimization subproblems faster in practice, which is useful for hyperparameter search, architecture search, planning and other tasks relevant to advanced AI. Surveys and experiments discuss potential gains and limits. [PMC+1](#)
3. **Richer data representations and feature spaces.**  
Quantum states naturally encode very high-dimensional feature maps; quantum kernels / embeddings can in principle separate data classical methods struggle with — useful for small-data/high-dimension regimes. [arXiv](#)
4. **Scientific simulation + AI synergy (important practical use-case).**  
Quantum hardware excels at simulating quantum systems (chemistry, materials, biological molecules). Coupling quantum simulation with AI (e.g., ML models trained on quantum-simulated data or used to analyze simulation output) accelerates discovery pipelines that classical compute struggles with — a concrete, near-term synergy. (See the IBM/Moderna and other recent demonstrations.) [Live Science+1](#)
5. **Hybrid quantum–classical stacks for AGI-scale workloads.**  
Many authors argue the realistic path is hybrid: classical neural nets augmented by quantum subroutines (or quantum accelerators for targeted tasks), rather than full AGI running purely on quantum hardware. That hybrid view is common in recent reviews. [ScienceDirect+1](#)

### Important caveats & limits

- **No evidence quantum computing by itself provides hypercomputation.** Several recent philosophical/technical papers conclude QC does *not* bypass Turing limits or automatically produce “superintelligence.” Quantum hardware is a tool, not a magic bullet. [SpringerLink+1](#)
- **Practical bottlenecks remain large:** noise, error correction overhead, qubit scaling, and *data loading* (how to efficiently get large classical datasets into quantum form, e.g., qRAM) limit real-world advantage for many ML tasks today. [arXiv+1](#)

- **Provable speedups are often narrow:** many QML proposals show advantage only for specific problem families (structured linear algebra, specific kernel problems, small-sample regimes) — not a universal AGI speedup. [ACM Digital Library](#)

### **So: could quantum computing accelerate a path to superintelligence/AGI?**

Possible in the sense of providing **targeted computational speedups** (better simulation, sampling, optimization, or new feature mappings) that make some AGI components more efficient. **Unlikely** that QC alone will *create* superintelligence; AGI will still require algorithmic breakthroughs, data, safety/interpretability advances and systems engineering. Recent scholarly work explicitly examines and mostly rejects the idea that quantum devices automatically enable hypercomputation. [SpringerLink+1](#)

### **Recommended recent literature (good starting list)**

1. **“A Survey on Quantum Machine Learning: Basics, Current Trends ...”** — arXiv survey summarizing QML techniques and open problems. Good technical primer. [arXiv](#)
2. **“Quantum machine learning: A comprehensive review”** — PMC / open-access review covering algorithms, hybrid frameworks, and application areas. Helpful for applied/readable overview. [PMC](#)
3. **“On quantum computing for artificial superintelligence”** (Springer / philosophy of science paper, 2024) — critical perspective arguing QC doesn’t grant hypercomputational powers; useful for clarifying limits. [SpringerLink](#)
4. **ACM / other 2024–2025 surveys on QML** — recent peer-reviewed overviews that discuss foundations, datasets, and when advantage is realistic. (See ACM survey and other reviews.) [ACM Digital Library+1](#)
5. **Industry/white papers & news examples** — e.g., IBM/Moderna quantum simulation of mRNA structures and quantum/industry pieces showing practical Q×AI projects (good to ground expectations).