Quantum Workforce Development
Connecting Industry, Academia and Society

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Abstract: We present a workforce training proposal characterized by demystifying quantum technologies, focusing on practical, ready-for-application solutions and offering hands-on training, including a pilot program showcasing the practical potential of quantum computing.

Motivation and Objectives

The quantum industry is at a pivotal moment, demanding disruptive solutions that generate tangible economic outcomes within tight timeframes. Unlike academia, which focuses on fundamental research in these areas, whether incremental (small improvements) or transformative (ground-breaking discoveries) the industrial sector prioritizes technologies that are ready for immediate application and offer clear returns on investment.

In this context, workforce development must transcend generic training programs or certifications and adopt a pragmatic, tailored approach. [1] [5]. This proposal addresses three key challenges:

- Demystification: Cutting through the hype surrounding quantum technologies to clearly delineate what is genuinely achievable versus speculative.
- Readiness: Focusing on technologies that are mature enough for industrial adoption, such as quantum sensing.
- Funding Support: Assisting companies in navigating funding opportunities and building quantum-driven projects by leveraging national and European resources, including PNRR and Horizon Europe.

The goal is twofold: to equip professionals with actionable knowledge of quantum technologies and to foster dialogue between experts, decision-makers and funding bodies, ultimately ensuring that quantum innovation has a meaningful societal impact. [2] [5] [4]

Proposed Training Program

The **Q-TRAIN** program offers an interdisciplinary curriculum tailored for managers, engineers, innovators and non-STEM professionals. It provides a comprehensive introduction to quantum technologies, emphasizing state-of-the-art advancements like quantum sensing and NISQ systems. Participants will engage in practical demonstrations, exploring industrial applications such as optimization and quantum-enhanced machine learning, supported by hands-on training with relevant technologies.

A key component of the program is the **Partenope pilot project**, centered on the superconducting quantum computer at the University of Naples Federico II. Participants will gain exclusive access to the laboratory, interact with experimental physicists showcasing the integration of quantum computing into industrial workflows.

This initiative stands out for its focus on demystifying quantum technologies, fostering clarity and delivering practical exposure. Through sessions designed to dispel misconceptions and interactive experiences with industry experts, participants will acquire actionable knowledge and strategies for engaging with decision-makers, funding bodies, and real-world applications.

References

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