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Computer Science Research Notes

Quantum Informatics, Computing & Technology 2025

QC–HORIZON 2025

Plzen, Czech Republic
August 26-27, 2025

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Preface

The QC–HORIZON 2025 Conference on *Quantum Informatics, Computing & Technology* was held online on August 26, 2025, under the auspices of the **www.QC-Horizon.eu** initiative. Originally intended as an in-person event, the conference was successfully conducted entirely online via Zoom due to the prevailing world security and political situation. This change of format allowed broader international participation while maintaining the high standards of scientific exchange and collaboration that the conference series represents.

The aim of QC–HORIZON 2025 was to bring together leading experts from academia, industry, and defense sectors to explore the rapidly advancing field of quantum computing. The conference served as a forum to present new findings, exchange ideas, and stimulate collaborations in areas spanning quantum informatics, algorithms, architectures, communication, and applications. The guiding motto of the event emphasized its mission:

> *"The QC–Horizon conference will bring together leading experts from academia, industry, and defense sectors to explore the rapidly advancing field of quantum computing. It aims to uncover emerging breakthroughs, share insights, and support collaborations to drive quantum innovation and impact across various topics and applications."*

The conference program included keynote talks, regular presentations, and discussions covering a wide spectrum of topics in quantum science and technology.

We were honored to welcome distinguished keynote speakers:

- **Sabre Kais**, North Carolina State University, North Carolina, USA
  Modulator-Assisted Local Control of Quantum Battery via Zeno Effect
- **Cheng Wu**, Missouri University of Science and Technology, USA
  Nonlocal quantum computing theory.
- **Eduardo Bayro-Corrochano**, Poznan University of Technology, Poland
  Geometric Algebra in Quantum Computational Intelligence.

More than 65 participants joined the conference online, with the 21 research papers originating from institutions across the world, demonstrating the truly international scope and strong global support for the event.

The proceedings presented in this issue of the *Computer Science Research Notes (CSRN)* reflect the diversity and depth of the contributions. They include theoretical advances, algorithmic developments, implementation studies, and application-oriented research, all of which highlight the transformative potential of quantum computing for science, technology, and society.

We express our deep gratitude to all authors, reviewers, and participants for their valuable contributions and engagement. Special thanks are due to the organizing and technical teams who ensured that the transition to an online format was smooth and effective. Their dedication made QC–HORIZON 2025 a successful and memorable event.

We hope that this collection of research papers will inspire further advances and collaborations in the quantum computing community. We look forward to future editions of QC–HORIZON and to continuing the tradition of fostering innovation and dialogue in this rapidly evolving field.

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