Call for Papers

QCCC-25: The 4th International Workshop on Quantum-Classical Cooperative Computing

Half-Day Workshop at ISCA 2025 — June 21, 2025

Overview

Recent years have brought remarkable advances in quantum computing, transitioning from early noisy-intermediate-scale quantum (NISQ) devices to increasingly sophisticated fault-tolerant quantum computing (FTQC) systems. As these systems continue to evolve, harnessing the power of quantum devices in conjunction with classical computing has emerged as a promising path for addressing scientific and engineering challenges. The **4th International Workshop on Quantum-Classical Cooperative Computing (QCCC-25)** seeks to explore innovative approaches, architectures, and software techniques that enable seamless integration between quantum and classical computing platforms, aiming to enhance the scalability, reliability, and practical impact of quantum computing.

Topics of Interest

We welcome submissions addressing **quantum-classical cooperative computing (QCCC)** in theory, architecture, algorithms, or system design. Relevant topics include, but are not limited to:

- Architectural support for quantum-classical cooperative computing
- Quantum-classical hybrid algorithms
- Hardware/software co-design for QCCC
- Quantum error correction
- Quantum random access memory
- Architectures for distributed quantum computing
- Quantum resource estimation and management
- Circuit decomposition, integration, and transpilation techniques
- Encoding/decoding classical information into/from quantum states
- Quantum error mitigation strategies
- Variational quantum algorithms (VQA)
- Early Fault-tolerant algorithm and architecture design
- Other QCCC approaches and architectures

(Please note that purely quantum or purely classical algorithm/hardware design, as well as general benchmarking without emphasis on hybridization, fall **outside** the scope of this workshop.)

Submission Instructions

- **Submission Format**: Extended abstracts of 2–4 pages (excluding references) are strongly encouraged.
- **Submission Site**: A link to EasyChair or a relevant submission platform will be provided on the workshop website.

- **Publication**: Accepted abstracts will appear in the workshop proceedings. Authors remain free to submit a full version of their work to another venue in the future.

Important Dates

- **Extended Abstract Submission Deadline**: April 25, 2025
- **Acceptance Notification**: May 12, 2025
- **Camera-ready Abstracts Due**: May 30, 2025
- **Workshop Date**: June 21, 2025 (half-day)

Workshop Format

- **Keynote & Invited Talks**: The workshop will feature one keynote presentation by a leading expert from academia, industry or National laboratories. One or two additional invited talks will also be scheduled.
- **Accepted Abstracts**: Authors of accepted abstracts will present short talks (or a poster, depending on scheduling).
- **Venue & Timing**: The workshop is co-located with **ISCA 2025**. It will run for a half day, with the exact schedule announced after final acceptances.

Organizing Committee

- **Workshop co-chair**:
  Chenxu Liu, Pacific Northwest National Laboratory, USA
  Edoardo Giusto, University of Naples Federico II, Italy
  Samuel Stein, Pacific Northwest National Laboratory, USA

Program Committee

A diverse Program Committee (PC) of experts in quantum computing, computer architecture, and systems design will review submissions. PC members and experts from various national labs, universities, and industries will be announced on the workshop website.

For more information, please visit the official **QCCC-25** webpage (URL forthcoming). We look forward to your contributions and to seeing you at ISCA 2025!