



Carmen G. Almudever holds a P.h.D. in Electronic Engineering from Universitat Politècnica de Catalunya (UPC BarcelonaTech), Spain. For the work she did during her PhD, she received the Doctoral Student Honor Scholarship by INTEL (2012). In 2021, she joined the Computer Engineering department of the Technical University of Valencia (UPV, Spain) as a distinguished researcher under the Beatriz Galindo program for attracting talented researchers. Before, from 2014 to beginning 2021, she was an Assistant Professor at the Quantum and Computer Engineering Department and group leader at the Quantum Computing division of QuTech at Delft University of Technology. She worked on the definition and implementation of scalable quantum computer architectures, being one of the PI's of the 10-year Intel-QuTech collaboration on quantum computing. She is an associate editor of the ACM Trans. on Quantum Computing and served as the Program Track co-chair (Quantum Systems Software) of QCE22. She is the coordinator of the EIC Pathfinder Open project QUADRATURE on scalable multi-core quantum computer architectures. Her research focuses on different aspects of the quantum computing full-stack including quantum programming languages and compilers, quantum error correction, fault-tolerant quantum computation, compilation of quantum algorithms, benchmarking and scalability of quantum computers.

Women in Science

Architecting full-stack quantum computing systems in the NISQ era and beyond

Carmen G. Almudever

Technical University of Valencia, Spain

Abstract:

The advances in quantum hardware with functional quantum processors integrating tens of noisy qubits, together with the availability of near-term quantum algorithms have allowed the development of the so-called full-stacks that bridge quantum applications with quantum devices. In this talk, we will provide an overview of the different layers of the quantum computing full-stack, with emphasis on the software ones that include the compilation of quantum algorithms. We will then discuss the need for optimal physical-aware and algorithm-driven compilation techniques in the midst of the NISQ (Noisy Intermediate-scale quantum) era. We will also focus on key principles for architecting quantum computers such as codesign, optimization and benchmarking. Finally, we will talk about the scalability of quantum computing systems, which is one of the main challenges the quantum computing community is currently facing .

Date & Time: 18 December, 2023 (27 Azar, 1402)- 18:30-19:30 (Tehran Time)

Link: <https://us02web.zoom.us/j/82766000921?pwd=SUhwaHJYZEtjZUt6dXFMQ2VyTmZBdz09>

Meeting ID: 827 6600 0921 - **Passcode:** 421341