

Preface

It is recognized that there is a rapidly increasing awareness of the need for quantum computing applications, and there is a great desire to produce quality quantum software in a controlled manner. However, this is ineffective unless research and practitioners come to understand how software engineering can help. As the Talavera Manifesto for Quantum Software Engineering and Programming stated, Quantum Software Engineering (QSE) is a necessary contribution to the success of quantum computing. IEEE defines Software Engineering as “*the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software, as well as the study of these approaches*”; that is, the application of engineering to software. It is time to take care of producing quantum software by applying knowledge and lessons learned from the software engineering field. This implies to apply or adapt the existing software engineering processes, methods, techniques, practices, and principles for the development of quantum software, or even to create new methods and techniques.

To address this challenge, the 1st Quantum Software Engineering and Technology Workshop (Q-SET) has been organized. Q-SET is promoted by aQuantum, a research unit that groups Alarcos Research Group at University of Castilla-La Mancha (UCLM) and Alhambra company.

Q-SET was conducted on October 13, 2020 co-located with IEEE International Conference on Quantum Computing and Engineering (IEEE Quantum Week). It was to be held in Denver — Broomfield, Colorado, USA, although it was eventually conducted in online mode because of the COVID-19 pandemic.

The first edition of Q-SET had 6 speakers plus a keynote by Dr. Eleanor G. Rieffel, senior research scientist lead of Quantum Artificial Intelligence Laboratory (QuAIL) at NASA Ames Research Center. Thus, Q-SET proceedings consists of 6 papers, in which researchers and practitioners in Q-SET discussed main challenges of quantum software engineering.

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