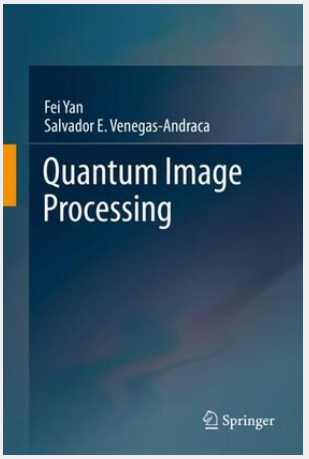
Venegas-Andraca / Yan

Quantum Image Processing



This book provides a comprehensive introduction to quantum image processing, which focuses on extending conventional image processing tasks to the quantum computing frameworks. It summarizes the available quantum image representations and their operations, reviews the possible quantum image applications and their implementation, and discusses the open questions and future development trends. It offers a valuable reference resource for graduate students and researchers interested in this emerging interdisciplinary field.

This book provides a comprehensive introduction to quantum image processing (QIP), which focuses on extending conventional image processing tasks and operations to quantum computing frameworks. It starts with the fundamentals of quantum computation and quantum information and an introduction to the birth of QIP. It then summarizes a variety of possible representations for quantum images as the premise for the ensuing discussions in the book. With reference to the available representations, it also comprehensively reviews a complete list of basic and advanced operations, applications, and the likely extensions. Lastly, it offers a detailed discussion of the open questions and future directions in QIP in order to stimulate further interest in the pursuit of more advanced algorithms and experimental validations for available technologies and extensions to other domains. The book offers readers with a background in both computer science (esp. digital image processing) and physics (esp. quantum mechanics) valuable insights into the interdisciplinary field of QIP. It also provides a diverse and readable introductory text and reference guide for graduate students and researchers interested in this emerging field.

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