

## Preface: Water-related vision

Water-related optical imaging serves as a crucial tool and method for human beings to understand aquatic environments, develop and utilize water resources, and protect aquatic ecosystems. It offers distinct advantages such as intuitive target detection, high imaging resolution, and rich information content. However, due to the absorption and scattering properties of water, water-related optical imaging is often plagued by noise, making the acquisition of clear images a challenging task. With the advancement of artificial intelligence, water-related optical imaging and processing technologies have made remarkable progress. It can be anticipated that the continuous development of advanced water-related optical imaging and processing technologies will provide more accurate and comprehensive information for water-related scientific research and environmental protection, opening up more opportunities for human exploration and development of the ocean.

This special topic focuses on the latest technological advancements and achievements in the field of water-related optical imaging and processing. These papers delve into noise suppression techniques in water-related environments, expanding our understanding of noise interference in water-related environments. With this theme, our goal is to shift the perspective of researchers and practitioners—encouraging them to view noise not merely as an obstacle to be overcome but as a fundamental factor that influences the accuracy and reliability of water-related observations. This is also one of the important tasks I have done since joining TeleAI. I would like to express our sincere gratitude to all the contributors to this special topic. This preface aims to set the tone for the subsequent discussions on this topic, positioning noise management as a key to the advancement of water-related optical imaging technologies and emphasizing the role of cutting-edge research in shaping future exploration and applications.

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