

# Preface

Encoding local features of images (also known as feature coding) is a key issue in computer vision and pattern recognition and essential to many visual tasks such as object/scene classification and image/video retrieval. It has been widely studied, and a large number of algorithms have been proposed in the past several years.

However, there has not been a monograph that carefully summarizes various feature coding algorithms and discusses how to apply them successfully, possibly due to the variety of their motivations and representations, the difficulty of exploiting their relations and characteristics, and the difference in experimental comparison rules. With an attempt to address these problems, this monograph provides a comprehensive study in the following aspects:

- Introduces various feature coding methods, including their motivations and mathematical representations;
- Exploits their relations, based on which a taxonomy is proposed to reveal how they evolve and develop;
- Summarizes the main characteristics of current feature coding algorithms, each of which is shared by several coding strategies;
- Discusses the applications of feature coding in different visual tasks, and considers the influence of some key factors in feature coding with sufficient experimental studies;
- Provides suggestions of enhancing and employing feature coding in practice, and points out potential directions for future work.

We hope that this monograph provides a useful reference toward feature coding for researchers, practitioners, and students working on problems where feature coding is an issue, such as object classification, scene categorization, and image retrieval.

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