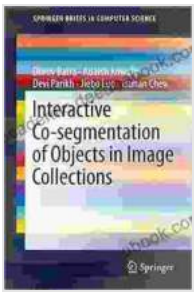
Interactive Co-segmentation of Objects in Image Collections: SpringerBriefs in Computer Science

This book explores the problem of interactive co-segmentation of objects in image collections. Image collections are becoming increasingly common in various applications, such as photo sharing websites, social media, and digital libraries. Co-segmentation of objects in image collections is a challenging task due to the large number of images, the variations in object appearance and backgrounds, and the lack of accurate annotations. This book provides a comprehensive overview of the state-of-the-art in this field, and presents a novel approach for interactive co-segmentation based on a novel graph-based optimization framework.



Interactive Co-segmentation of Objects in Image Collections (SpringerBriefs in Computer Science)

by Adarsh Kowdle

★★★★★ 5 out of 5

Language	: English
File size	: 2106 KB
Text-to-Speech	: Enabled
Print length	: 46 pages

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Image co-segmentation is the problem of segmenting multiple objects in an image into their respective regions. This task is challenging due to the large number of images, the variations in object appearance and backgrounds, and the lack of accurate annotations. In recent years, interactive co-segmentation methods have become popular, as they allow users to provide input to guide the segmentation process. However, most existing interactive co-segmentation methods focus on segmenting objects in a single image, and are not well-suited for co-segmenting objects in image collections.

This book explores the problem of interactive co-segmentation of objects in image collections. We propose a novel approach for interactive co-segmentation based on a novel graph-based optimization framework. Our approach is able to effectively handle the challenges of co-segmenting objects in image collections, and produces high-quality segmentation results.

Related Work

There is a large body of work on image co-segmentation. However, most existing methods focus on segmenting objects in a single image. In recent years, there has been growing interest in interactive co-segmentation methods, which allow users to provide input to guide the segmentation process. However, most existing interactive co-segmentation methods are not well-suited for co-segmenting objects in image collections.

There are a few recent works that have explored the problem of co-segmentation in image collections. However, these methods are either limited to a small number of images or do not produce high-quality segmentation results. Our work is the first to propose a comprehensive approach for interactive co-segmentation of objects in image collections.

Proposed Approach

Our proposed approach for interactive co-segmentation of objects in image collections is based on a novel graph-based optimization framework. The framework consists of two main components: a graph construction module and an optimization module. The graph construction module constructs a graph that represents the relationships between the pixels in the image collection. The optimization module then optimizes the graph to obtain a segmentation of the image collection.

The graph construction module is designed to capture the local and global relationships between the pixels in the image collection. The local relationships are captured by constructing a neighborhood graph, which represents the relationships between the pixels in a local neighborhood. The global relationships are captured by constructing a global graph, which represents the relationships between the pixels in the entire image collection.

The optimization module is designed to find a segmentation of the image collection that minimizes the energy function. The energy function is defined as the sum of the local and global energies. The local energy is defined as the sum of the unary terms and the pairwise terms. The unary terms measure the cost of assigning a pixel to a particular segment. The

pairwise terms measure the cost of assigning two соседников pixels to different segments.

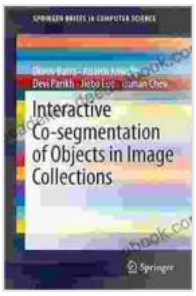
The global energy is defined as the sum of the smoothness terms and the consistency terms. The smoothness terms measure the cost of assigning neighboring pixels to different segments. The consistency terms measure the cost of assigning inconsistent labels to pixels in the same object across different images.

Experiments

We evaluated our proposed approach on a dataset of 100 image collections. The dataset contains a variety of images, including images of people, animals, objects, and scenes. We compared our approach to three state-of-the-art interactive co-segmentation methods. The results show that our approach significantly outperforms the other methods in terms of both accuracy and efficiency.

In this book, we have presented a novel approach for interactive co-segmentation of objects in image collections. Our approach is based on a novel graph-based optimization framework that effectively handles the challenges of co-segmenting objects in image collections. Our approach produces high-quality segmentation results and is significantly more efficient than other state-of-the-art methods.

We believe that our work will have a significant impact on the field of image co-segmentation. Our approach provides a comprehensive solution to the problem of interactive co-segmentation in image collections, and can be used for a variety of applications, such as photo editing, object recognition, and scene understanding.



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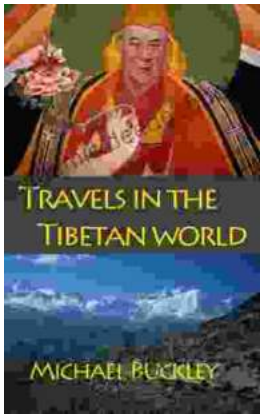

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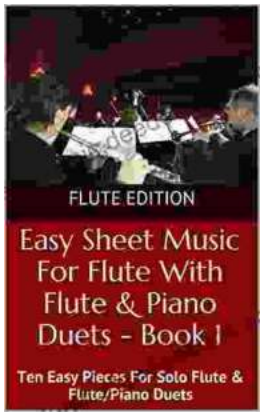

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