YEDITEPE UNIVERSITY
Faculty of Engineering
Electrical and Electronics Engineering Seminars

STATISTICAL METHODS FOR FINE-GRAINED RETAIL PRODUCT RECOGNITION

İPEK BAZ

Abstract

In recent years, computer vision has become a major instrument in automating retail processes with emerging smart applications such as shopper assistance, visual product search (e.g., Google Lens), no-checkout stores (e.g., Amazon Go), real-time inventory tracking, out-of-stock detection, and shelf execution. At the core of these applications lies the problem of product recognition, which poses a variety of new challenges in contrast to generic object recognition.

Product recognition is a special instance of fine-grained classification. Considering the sheer diversity of packaged goods in a typical hypermarket, we are confronted with up to tens of thousands of classes, which, particularly if under the same product brand. They tend to have only minute visual differences in shape, packaging texture, metric size, etc… It is very difficult to discriminate from one another. Another challenge is the limited number of available datasets, which either have only a few training examples per class that are taken under ideal studio conditions, or are captured from the shelf in an actual retail environment and thus suffer from issues like blur, low resolution, occlusions, unexpected backgrounds, etc. Thus, an effective product classification system requires substantially more information in addition to the knowledge obtained from product images alone.

In this talk, I will present statistical methods for fine-grained retail product recognition. In the first part of the talk, I will focus on a novel context-aware hybrid classification system for the fine-grained retail product recognition problem. In the second part of the talk, I will introduce a new approach for fine-grained classification of retail products that learns and exploits statistical context information about likely product arrangements on shelves, incorporates visual hierarchies across brands, and returns recognition results as "confidence sets" that are guaranteed to contain the true class at a given confidence level.

Biography:

İpek Baz received the B.Sc. degree in Electronics Engineering from Sabancı University, Istanbul, Turkey and the M.Sc. degree in Electrical and Electronics Engineering from École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland. She received her Ph.D degree in Electronics Engineering at Sabancı University. Since 2019, she has been working as a senior researcher at TUBİTAK BİLGEM. Her research interests include machine learning, pattern recognition, statistical modeling, image processing, and computer vision.

Date: 26th June 2020
Time: 11:00 am
Online Link: meet.google.com/bhn-wqqg-dqv