Augmenting existing food image datasets with Greek dishes

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Abstract

Tourism dates back to ancient times, as ancient Greek philosophers recognized the concept of rest-based tourism. In the Dark Ages tourism took the form of participation in festivals and events, while in the 16th century an aristocratic form of tourism surfaced that focused on culture and education. As the centuries progressed, the emerging middle classes formed the most important element of tourism and reshaped the purpose and related activities. Nowadays, even though we are moving towards a globalized (and, in a way, unified) world, people are more and more looking for unique experiences in tourism, experiences based on 'divergence', distinct identity and culture. *Local gastronomy* has a strong potential in providing that 'divergence' element.

According to the relevant literature *gastronomic tourism* is the visit to primary and secondary food and drink producers, gastronomy festivals, dining venues and specific locations, where tasting and experience of special local food features are a prime motivation for the visit. Apparently, *the level of interest in gastronomy* varies in tourists but it is still there for everyone, as it is connected to one of the most basic human needs for nutrition and socialization.

Several attempts have been made to this date to enhance tourism with technological innovation and support tourists in easily discovering new experiences. Recently, the growing interest in gastronomy pushed forward innovation in relevant applications with focus on visit planning, gastronomy routes, translation and image-based food identification. Modern food recognition systems (dish recognition) employ deep learning methods to learn food representations from the available food datasets. However, the same way they inherit compelling performance scores from the deep learning approaches, they also rely heavily on data. It has been observed that existing datasets contain limited information about Greek food[1]. Thus, these systems fail to recognize Greek dishes accurately, most of the time confusing them with food related to other countries.

This paper introduces a novel food dataset with the aim to provide additional information to computer vision systems tasked to identify local Greek gastronomy dishes, mainly from Northern Greece. Apart from manually collecting data from local gastronomy businesses, a framework that exploits both the abundance of information in the Web and image analysis algorithms has been developed. This framework adopts a web crawler technology that takes advantage of common web searching tools and databases. To filter out unrelated or duplicate data, an image analysis tool has been developed. So far, a significant number of data have been collected successfully (over 100.000 images spanning more than 100 different dishes). Incorporating the new Greek food dataset to the existing global datasets will further enhance the performance of deep learning algorithms.

Therefore, the contribution of this paper is three-fold: first, it introduces a novel framework for data acquisition from the web with minimal human intervention; second, it augments existing global food datasets with Greek dishes (the new dataset will be publicly available); third, it aids in increasing the accuracy of existing food recognition systems on Greek dish identification.

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[1] Extensive study has been done in the framework of the relevant Greek national project GRE-Taste and preliminary results have already been published.