



Practice Abstract no. 26

Food and nutrition components - Food recognition from photos

To facilitate the development of innovative applications for personalised nutrition and food retail, FOODITY has made available five components. FOODITY partner CErTH crafted these components and are directly related to functions concerning food and nutrition.

This practice abstract describes the second iteration of the food recognition from photos component (initially presented in Practice Abstract 1), particularly its characteristics, specific formats, functionalities, the mechanisms in which they operate, and the licensing terms under which it can be made available.

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| What is provided | The updated version of the AI model from FOODITY Deliverable D1.1, which is a deep learning network that automatically recognises food, depicted in a photo. This updated model is lighter than the previous version due to the use of UniFormer. |
| Component format | In the form of a <i>.py</i> (Python) file and <i>.bin</i> (model weights) file. |
| What it does | Receives as input a photo of food, analyses the photo, and provides as output a probability for each element in a specified list of foods (food titles), to be the depicted food. |
| How it works | The model is based on a UniFormer network architecture which splits photos in patches, processes the patches in different scales, produces photo specific feature vectors, and classifies them to food classes (specific foods). The model has been trained on and evaluated on the Food2K dataset ¹ . Food2K is a large food recognition dataset with 2,000 categories and over 1 million images. |
| Technical details/considerations | The above model has been developed, trained, and tested on the following system requirements: GPU GeForce RTX 3080 10 GB, RAM 32 GB, CPU i9-10900K, Cuda 11.3, Cudatoolkit 11.3.1, Python 3.9.16, Pytorch 1.10.2, Ubuntu 20.04.5 LTS. |
| Related datasets/standards | The dataset used for the training and test of this model are the Food2K. It consists of 2000 categories respectively. Some of the Food2K categories are Margherita pizza, Black pepper steak, Tonkatsu, to give some examples. |
| References | The component was based on validated work that has been published (Min et al., 2023). |

¹ <http://123.57.42.89/FoodProject.html>



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Food recognition from photo - examples of images on Food2K