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The source of each piece of information is appropriately cited when relevant.

Relevant topics (index):

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* Caffe framework for Deep Learning

* The Weather Classification problem
  + Description

“Vision based driver assistance systems (DAS) are currently designed to perform under good-natured weather conditions. Unfortunately, limited visibility often occurs in daily life (e.g. heavy rain or fog). As this strongly affects the accuracy or even the general function of vision systems, the actual weather condition is a valuable information for assistance systems. Based on the results of weather classification, specialized approaches for each class can be invoked to improve cognition. This will form a key factor to expand the application of DAS from selected environmental conditions to an overall approach.” [1]

“The weather affects our daily lives in many ways, from solar technologies, outdoor sporting events, to the sort of clothes we wear and whether to stay indoors or not on weekend.

While current accurate weather detection technologies rely on expensive sensors, for centuries weather observing tools consisted of the human eye (and various human senses as well). If we can exploit existing surveillance cameras, which are found almost everywhere, it may be possible to turn weather observing and detection into a powerful and cost-effective computer vision application.” [2]

“The weather conditions not only strongly influence us in our daily lives [1] through the solar energy system and outdoor sporting events as examples, but also affects the functionality of many visual systems including outdoor video surveillance and vehicle assistant driving systems [2, 3] (by heavy rain, haze, etc.). It is no doubt that, judging the weather conditions by a single image, also known as weather classification task, plays a vital role in many visual and weather systems. Nowadays, the weather classification task is commonly accomplished by the human vision or expensive sensors. Since weather condition is local to an area, lack of the required human resources and/or the expensive sensors limits the avail- ability of local measurement of the weather condition. Recently, researchers argued that computer vision techniques could be developed to accurately classify weather conditions through images, which might save expensive human and instrumental resources (i.e., sensors) since economical surveillance cameras are ubiquitous and would be sufficient to accomplish weather classification. In this paper, we refer to weather classification from images as the task of predicting the class of the weather given an image (e.g., cloudy, sunny, etc.).” [3]

* + Applications
  + Approaches

“Different from the works above, we propose a method for classifying multi-class weather from single images which is based on multiple weather features and multiple kernel learning. Implementation of this idea, however, entails substantial challenges. First, it is difficult to find the suitable features to discriminate different weather. Second, the features might be heterogeneous and the feature vectors are high-dimensional. Aiming at the above challenges, firstly, we extract multiple features to represent different weather.” [4]

* + Approaches with CNNs

# Works Cited

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