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Comparison of Machine Learning and Deep Learning Algorithms for Automatic Classification of 80 Different Pollen Species

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Abstract : Palynology is a field of interest in many disciplines due to its multiple applications: chronological dating, climatology, allergy treatment, and honey characterization. Unfortunately, the analysis of a pollen slide is a complicated and time consuming task that requires the intervention of experts in the field, which are becoming increasingly rare due to economic and social conditions. That is why the need for automation of this task is urgent. A lot of studies have investigated the subject using different standard image processing descriptors and sometimes hand-crafted ones.In this work, we make a comparative study between classical feature extraction methods (Shape, GLCM, LBP, and others) and Deep Learning (CNN, Autoencoders, Transfer Learning) to perform a recognition task over 80 regional pollen species. It has been found that the use of Transfer Learning seems to be more precise than the other approaches

Keywords : pollens identification, features extraction, pollens classification, automated palynology
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