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Algorithms for Intelligent Vision Systems

Intelligent vision systems (IVS) are a set of interconnected hardware and/or software components which take digital image(s) as input data and process them by means of methods ranging from low- to high-level techniques/algorithms in order to extract meaningful information, which could be structured and organized into knowledge, and aid to the automatic understanding of the gathered visual data. Nowadays, IVS are present in a wide range of applications, ranging from autonomous vehicles to assisted-living devices; from rescue operations to video surveillance. These systems aim to get a higher autonomy as well as further levels of automated reasoning based on visual input and involves softwares integrating AI-based algorithms. Hence, the design of the new generation IVS is facing several challenges such as correctness and learnability as well as security and transparency. In particular, the choice of adequate algorithms for IVS is of prime importance. Indeed, these algorithms must be not only reliable and accurate, but also explainable and portable. Hence, this talk focuses on presenting efficient algorithms for the IVS dedicated to tasks such as the automated detection, recognition, and tracking of objects of interest.