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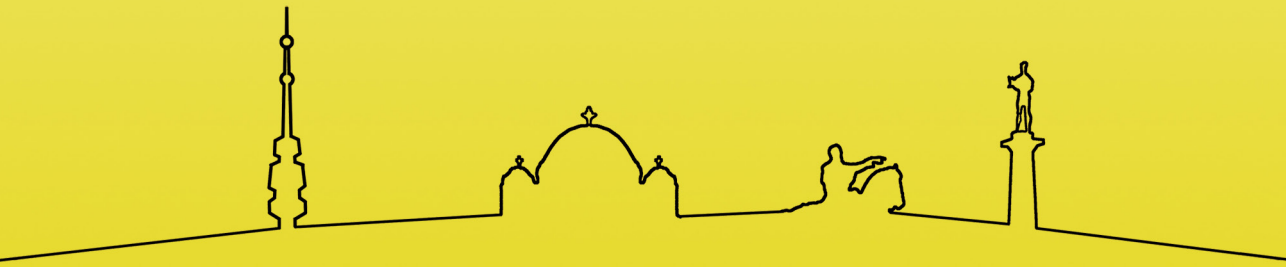

ARTIFICIAL INTELLIGENCE TO COUNT AND DISCRIMINATE HONEY BEE ACTIVITY AT THE HIVE ENTRANCE

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As a part of the European MEDIBEES project, the study of the behaviour of foraging bees under different levels of environmental stress is one of the most ambitious challenges, as it requires field trials to determine their activity and to be able to compare the data obtained in different Mediterranean countries in a reliable way. The most commonly used method up to now has been to manually count bees entering and leaving the hive during a certain time. Ideally, several measurements should be made at different times of the day during the whole period of beekeeping activity. However, this method is very time-consuming and therefore the number of measurements is often reduced, which can lead to inaccurate data on bee activity. On the other hand, colonies in very warm environments maintain their optimal temperature conditions thanks to bees that remain static at the entrance, beating their wings to increase the airflow inside the hive. At CIAPA (Centro de Investigación Apícola y Agroambiental de Marchamalo), we have tested the computer tool KATUA® Bees, developed by a Spanish company which, by means of artificial intelligence, has managed to count with more than 96% reliability both the bees that enter and leave the colony and also those that remain static at the entrance of the hive. This tool works on high quality videos of about 2 minutes previously recorded from the entrance of the hive and can be programmed to collect several videos, with the added advantage that data from several hives can be collected at the same time, allowing a more accurate comparison to be made. This new device represents a very important advance in the study of the vigour of bee colonies in real time. MEDIBEES: *Monitoring of the Mediterranean Honeybee Subspecies and their Resilience to Climate Change for the Improvement of Sustainable Agro-Ecosystems.* This project is part of the PRIMA program supported by the European Union

Keywords: Climate change adaptations, honeybee conservation, resistance to stressors