

Open positions for undergraduate research

(Financial support available)

Project: High-throughput video processing for analysis of honeybee behavior

Profile: Major in Computer Science or Applied Math or Biology with Computer Science minor

Context:

Honey Bees exhibit highly complex behavior and are vital for our agriculture. Due to the rich social organization of bees, the overall performance and health of a bee colony depends both on a successful division of labor among the bees and on adequate reaction to the environment, which involves complex behavioral patterns and biological mechanisms. Much remains to be discovered on these matters as research is currently limited by our ability to effectively collect and analyze individual's behavior at large scale. The technology developed in this project will enable us to **study the individual behavior of thousands of bees over extended periods of time** by using video to track them in front of their colony. This multi-disciplinary project is between the Computer Science and Biology departments of UPR-Río Piedras and the Mathematical Sciences department of UPR-Mayaguez.

Objectives:

The undergraduate research will be defined according to the skills, interests and motivation of the students. The project provides opportunities to work on the following topics:

- **Computer graphics:** scientific visualization for the annotation and display of bees' activities
- **Webapp development:** app to crowd-source data analysis, client and server side components
- **Computer vision:** automatic analysis of video data (tag detection, tracking of bees...)
- **High Performance Computing:** parallel computing on Linux cluster, GPU computing, code optimization and performance evaluation

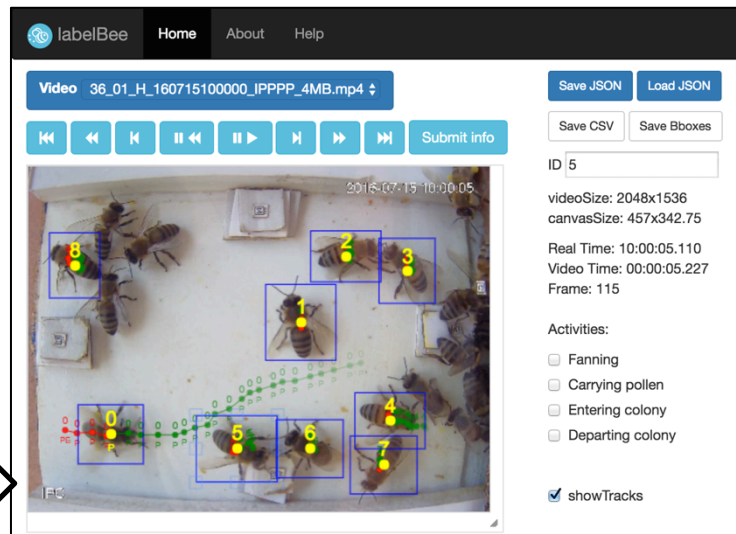


Figure 1. Left: camera recording of the entrance of honeybee colony. Right: Screenshot of WebApp to annotate bees activities (entering/departing from colony, bringing pollen...).

Contact: Rémi Mégret (remi.megret@upr.edu)

Assistant Professor, Computer Science Department, Office A-150

College of Natural Sciences, University of Puerto Rico, Río Piedras campus

Web: <http://ccom.uprrp.edu/~rmegret>

Phone: 787-764-0000 x88355