

Beehive Traffic

3D Vision Project Proposal
Supervised by: Sattler Torsten
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GROUP MEMBERS

Jonathan Burkhardt



Jasmin Fischli



Philipp Gldlin



Julie Veya



I. DESCRIPTION OF THE PROJECT

One problem that a beekeeper can encounter in spring, is the sudden swarming of his bees. They do so to find a new location for their colony.

In this project we want to count the number of bees that enter and leave the hive at any particular time, to be able to detect such a bee swarming. Using a GoPro camera we will take several short videos and apply background subtraction and segmentation with OpenCV to recognize the bees. To track the path of the bees in 3D we will use COLMAP.

For the support of our project we found a paper which uses the tracking system 'SwarmSigh' and one camera to count the bees.

II. WORK PACKAGES AND TIMELINE

Task	Group Member	Time period
literature research, get familiar with Python, OpenCV and COLMAP	Everyone	3 weeks
Taking several video recordings (test installation, different camera positions, uniformization of background)	Jonathan	1 week
Frame to frame association and Background subtraction	Julie, Philipp	2 weeks
Prepare presentation	Everyone	1 week
Midterm presentation	Everyone	
Implement segmentation (ellipses for the bees) and tracking	Jasmin, Philipp	3 weeks
Determine trajectories using COLMAP	Jonathan	2 weeks
Determine logic to count incoming and outgoing bees	Julie	1 week
Reflect on further improvement, possible enhancement of method and/or measurement	Everyone	2 weeks
Prepare final presentation	Everyone	1 week
Final presentation	Everyone	
Write the final report	Everyone	2 weeks
Final written report	Everyone	

Detailed descriptions of work packages you planned, their outcomes, the responsible group member and estimated timeline. Specify the challenges that will be tackled and considered solutions with possible alternatives, citing related documents if applicable. Mention the platform (Android, PC etc.) and the language (C++ etc.) you plan to use.

III. OUTCOMES AND DEMONSTRATION

In the of this project we want to be able to count the bees entering and leaving a hive and to track them using a single camera. We will show our result using a recorded video.

Instructions:

- The document should not exceed two pages including the references.
- Please name the document **3DVision_Proposal_Surname1_Surname2.pdf** and upload it via the moodle.