

BeeScanning-detect danger in time

With a smartphone using the camera and the BeeScanning app, beekeepers can combat the parasite mite varroa destructor as well as diagnose other features in the hive. Images are taken on living bees on the comb and analysed by artificial intelligence. Images help beekeepers diagnose the health status in the hive. The tool will also form basis for selection in breeding programmes as well as the basis for population modelling research in the colony.

BeeScanning is funded by the European Innovation Program, the Swedish Board of Agriculture and via Kickstarter. The project has been rewarded both Innovation of the year and Digital Innovation of the year 2018, at the ÖrebroEvent Regional contest.

Accomplished: 21 march 2018, the app launched. It communicates with a server where images are instantly analysed in the following categories : (accuracy figures)

- Detection of individual bees with varroa visible on body (≈ 95 %)
- Detection of Queen (>95 %)
- Detection of deformed wing virus ($=60$ %)
- Counting of number of bees in image ($=99\%$)
- Results are presented to the user in absolute figures and as mean varroa infestation level %.

Detected objects are labeled and displayed for review. Histograms indicates trends of the colony performance as a tool for decisions on treatment and/or breeding purposes.

The Beescanning technology is based on proprietary convolutional neural network, NN, and deep learning. Not to be mistaken by classification or algorithmic image analysing. This means results will continue to improve as the artificial intelligence learns from the ever increasing data its fed by the users.

Data is collected from growing the worlds largest database of images of bees on combs. The project march 2018 contains about 4000 images where regions of interest are labeled for the training of the NN. Published at tagger.beescanning.com. During 2018 we are investigating optical visual signs of several brood-diseases, new categories indicating varroa presence and varroa resistance traits as de- and recapping along with new techniques, sequence imaging, video, spectral analysing. We aim for a tool that can monitor events, nutritional status, health and make prognoses.

BeeScanning is based on our findings that there is a correlation between the actual varroa infestation level, as measured by alcohol washing or Apistan, and varroa that is optically detectable.

Please read more at <https://beescanning.com/eng/>