InsectUp : Crowdsourcing Insect Observations to Assess Demographic Shifts and Improve Classification

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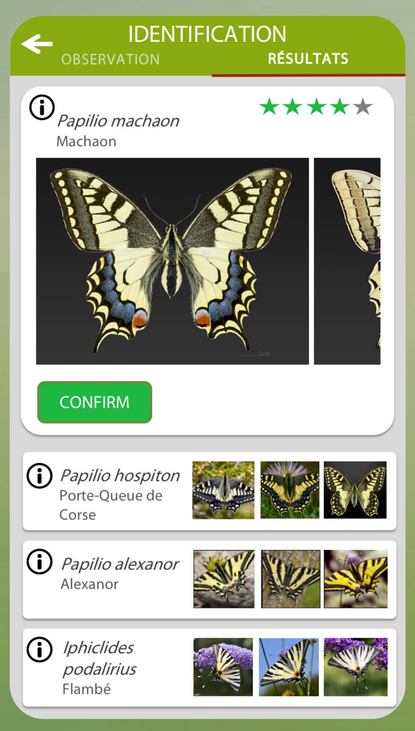
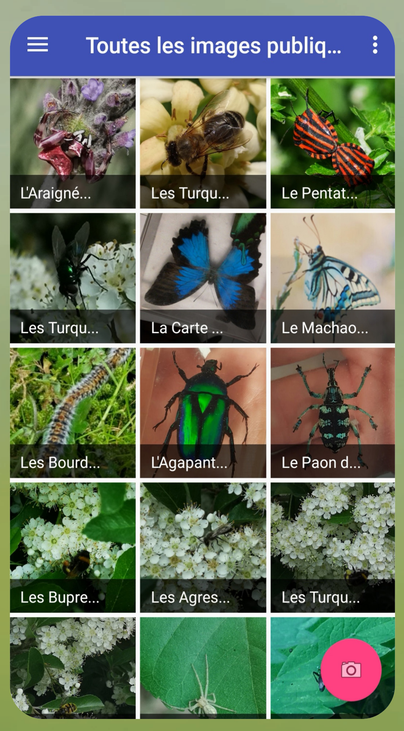
InsectUp : an Insect Identifier Mobile Application



AI assisted classification

Playful **features** to attract users



Feed to share and identify photos with the community

InsectUp Motivation

Insect demography shift causing devastating consequences for agriculture and ecosystems

Difficulties to evaluate insect demographics

InsectUp Mission

Crowdsource insect observations

Provide data to researchers to mitigate environmental threats

Raise people's awareness about the upcoming danger

The Original Dataset

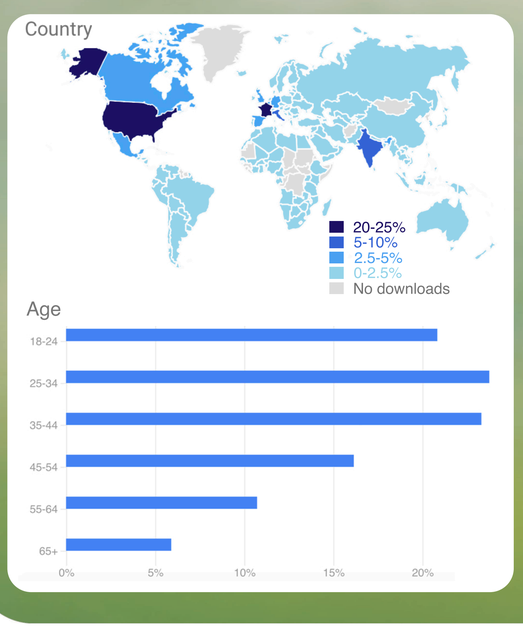
- 150k labelled photos of 403 European species of insects.
- Dataset provided by the SPIPOLL, a program from the French National Museum of Natural History.

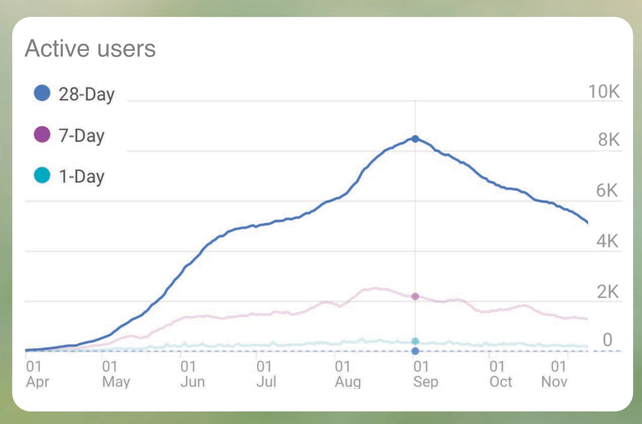
The Classification Algorithm

CNN architecture	Top 1 Accuracy
Inception v4	87%
ResNet152	84%

Transparent workflow using RampStudio platform

InsectUp Success





Left: Age and geographic distribution of InsectUp users.
Right: Active users from April to Nov. 2018 during the alpha phase.

Challenges & Potential Solutions

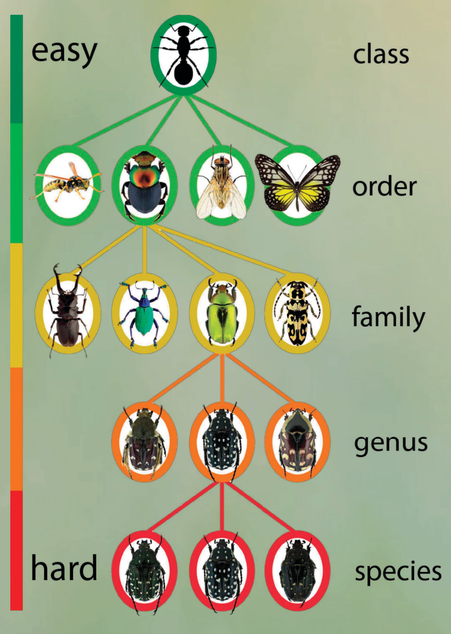
Algorithm capable of recognizing all 1 million known insect species

Species class balance highly variable.

Observer bias: some species will be reported more than others.

Few-shot learning

Less refined classification



Build a rigorous annotation pipeline to avoid erroneous identifications

Manual annotations from humans with different levels of expertise

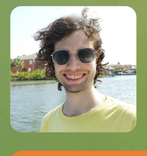
High level of similarity between some species.

Use reputation score

Use multiple identification suggestions

Attract entomologists for high quality identifications

Handle false observations



Degrades data quality and user experience

Moderated feed

Anomaly detection

Educate people

Data Collected

45k photos uploaded during the alpha phase.
Photo quality and insect species are very variable.