Active Detection from Adaptive Representation of High Resolution Images
Build Fast and Efficient Data Set for Automatic Environmental Assessment
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Active Learning, Semi-supervised Learning, Human in the Loop, Environmental Application, Computer Vision

Research Context

Nowadays, photo interpretation for environmental assessment is widely used but time-consuming.

- Automation of object detection is needed, but classical machine learning approaches show their limits.
- Creating a fully labeled dataset is also time-consuming and very dependent on topics.

Needs:
- Fast, efficient and robust data set
- Take into account the possibly fast changes between two assessment campaigns
- Adapt to each species
- Use the expert feedback

Within WIPSEA & IRISA partnership, two complex aerial image data sets are collected periodically. From 250 turtles to 1000 humans to detect, from 150 to 1000+ pictures each flight.

Framework and Problematics

How to select unlabeled instances?
- Real time feedback
- Reduced processing time

Create

Data Set
Labeled and Unlabeled Instances

Detection System
Features selection
Features extraction
Machine Learning Algorithms

Query
Label

Control

New campaign

Which image representation?

Detected and classified results

Labeling time & cost

My thesis work
System interaction

Provide Best Training Set

Train

Expert