



The Lab of CLEF dedicated to
biodiversity data

LifeCLEF: Species identification and prediction (6th edition)

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Introduction

A better knowledge and management of biodiversity is crucial to human food safety and health



[Comment](#) | [Published: 24 February 2020](#)

Declining biodiversity for food and agriculture needs urgent global action

Dafydd Pilling, Julie Bélanger  & Irene Hoffmann

Nature Food **1**, 144–147(2020) | [Cite this article](#)

1413 Accesses | **117** Altmetric | [Metrics](#)

The continuing loss of ecosystems, species and intraspecific genetic diversity has profound implications for agriculture, food security and human wellbeing. An urgent response is needed, including at global level.



[Review Article](#) | [Published: 09 December 2019](#)

Towards common ground in the biodiversity–disease debate

Jason R. Rohr , David J. Civitello, Fletcher W. Halliday, Peter J. Hudson, Kevin D. Lafferty, Chelsea L. Wood & Erin A. Mordecai

Nature Ecology & Evolution **4**, 24–33(2020) | [Cite this article](#)

1235 Accesses | **3** Citations | **30** Altmetric | [Metrics](#)

Abstract

The disease ecology community has struggled to come to consensus on whether biodiversity reduces or increases infectious disease risk, a question that directly affects policy decisions for biodiversity conservation and public health. Here, we summarize the primary points



LifeCLEF challenges



PlantCLEF



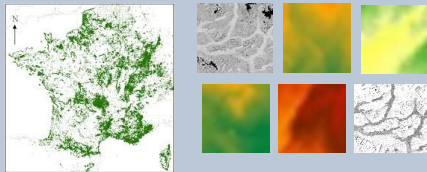
BirdCLEF



AICrowd



GeoLifeCLEF



SnakeCLEF





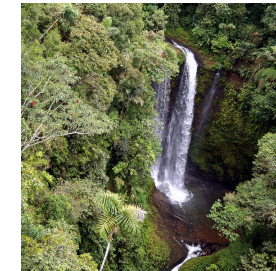
PlantCLEF a long term evaluation

Scientific investigations in automated plant species identification:

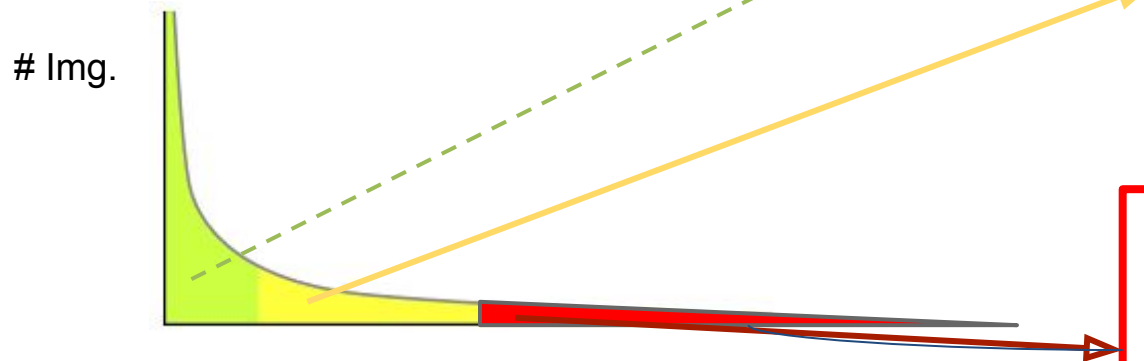
- 2011-12: early state of the art based on leaf (scans & photos)
- 2013: multi-organ (leaf, flower, fruit, stem, entire plant)
- 2014-15: scaling up to a psychological threshold of 1,000 species
- 2016: plant classification in an open world
- 2017: learning from noisy training data + up to 10,000 species
- 2018: comparison with experts
- 2019: performances in tropical floras?



*Mainly Western
Europe and
North America*



*Amazonian
Rain Forest*



**2020: performance on
visually
underrepresented
tropical species?**



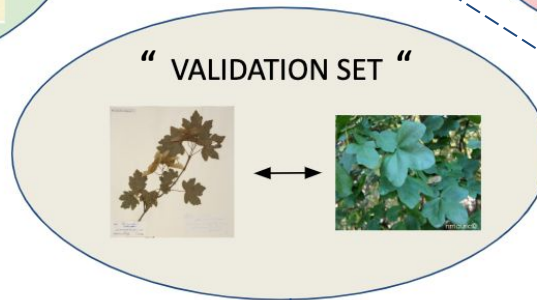


PlantCLEF

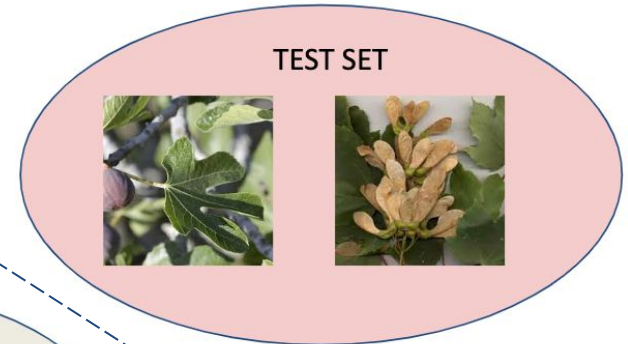
Cross-domain Plant Identification



330k herbarium sheets
1000 species



**350 individual plants (specimens)
associated with both herbarium
sheet(s) and photo(s) in the field**



3k photos in the field

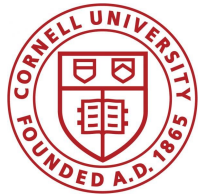




BirdCLEF 2020

Bird detection in soundscapes

Scenario: Predict the list of species that are audible in a 5-second segment of a soundscape recording.



Training data (~72,000 audio files):

- Mono-species recordings + metadata from Xeno-canto
- 960 classes (South & North America, Central Europe)

Test data (~25 hours of audio):

- 4 recording sites, 3 countries (USA, Peru, Germany)
- Very intense acoustic scenes with up to 8 species vocalizing at the same time (Average: 1.9)





BirdCLEF 2020

Bird detection in soundscapes

Rules:

- Train on mono-species recordings only
- Test on soundscapes only
- Validation data must not be used for training
- No model ensembles (but model distillation is allowed)

Metrics:

- rMap and cMap as in 2018 & 2019
- Separate evaluation for each recording location
- We are open for input from participants





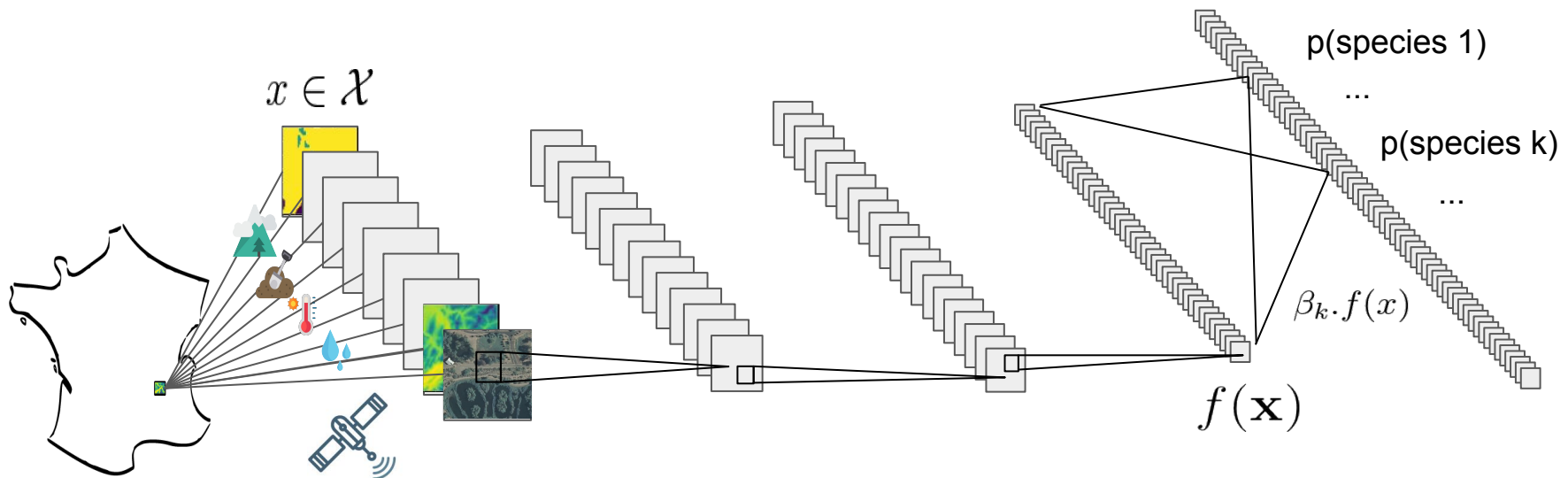
GeoLifeCLEF



Caltech

informatics mathematics
inria

- **Task:** Automatically predict the list of species that are the most likely to be observed in a given environment
- **Originality:** first publicly available dataset to pair remote sensing imagery with species observations

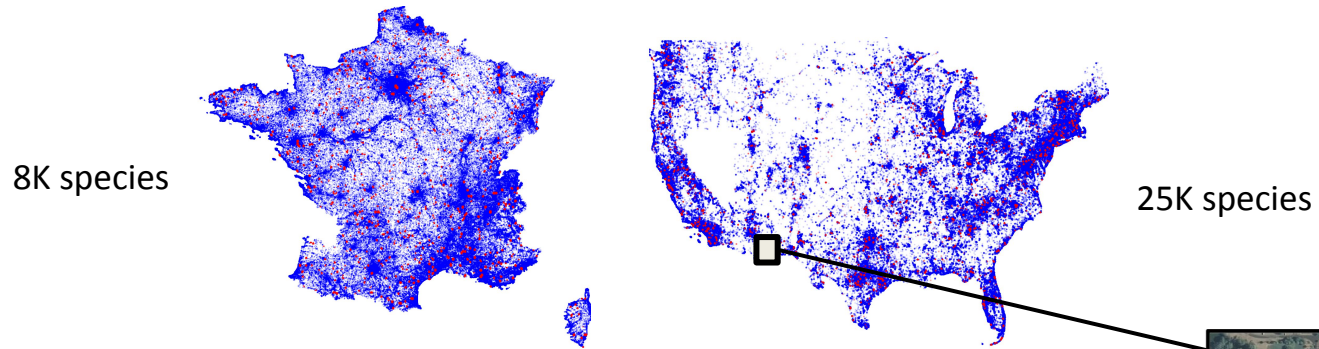




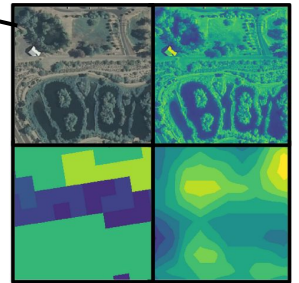
GeoLifeCLEF



- 2M species occurrences from  Pl@ntNet & iNaturalist

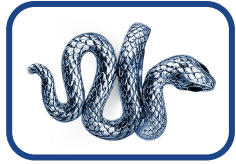


Each occurrence is paired with high-resolution covariates (RGB, IR, altitude, land-use) and coarse covariates (climate & soil variables)



- Train/test split: spatial-block hold-out (5km grid)
- Metric: adaptative top-K accuracy





SnakeCLEF

Scenario:

- Predict snake species in photos taken in the wild
- Over half a million victims of death & disability from venomous snakebite annually

Data: 245K images of 783 species, with geographic information at the continent and country level

- Pictures: iNaturalist, HerpMapper, Flickr, IndianSnakes.org
- Can be divided into training & testing as desired
- Other, more private testing data are available for later validation



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Organization team

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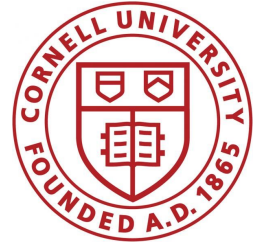


Thank you !



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