

From PI@ntNet to GeoPI@ntNet: new AI-based approaches for monitoring plant biodiversity

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Résumé. PI@ntNet is a citizen science platform that relies on artificial intelligence (AI) to facilitate the identification and inventory of plant species. It is based on a cooperative learning principle: users generate a large number of observations of plants in the field, which are automatically identified by an artificial intelligence algorithm and revised by the community itself, with a weighting principle based on the user's expertise. Observations that reach a sufficient degree of confidence are then added to the training set of the AI model, which is enriched and progresses over time. In addition, the data produced is used to model species distribution and map biodiversity indicators at very high spatial resolution. To this end, we are working on a new type of model called Deep Species Distribution Models (DeedSDM), which combine a wide range of sources of information on biotic and abiotic factors. These models, trained on large-scale, heterogeneous data, are very promising, but also pose a number of challenges in terms of multi-modal representation, input data bias and prediction uncertainty. Their integration into an interactive cartographic tool, called GeoPlantNet, will help make decisions on species conservation and land use planning.

Summary

Alexis Joly is a senior computer scientist with interests in machine learning applied to biodiversity. He is the scientific leader of the PI@ntNet citizen science project which develops a million-users platform based on AI. He is the founder of the LifeCLEF international virtual lab dedicated to the computer-assisted identification of living organisms.

