

A platform for extracting crucial information from satellite images

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Franck de Morsier, CTO, and Pierrick Poulenas, CEO of Picterra. Credit: Alain Herzog

EPFL start-up Picterra has devised a smart system that allows users to analyze drone or satellite images of a given territory: in a few clicks,

they can extract information, statistics and representations of changes that have taken place in the area. The startup, which is based at EPFL Innovation Park, will present its system to sector professionals and the public tomorrow at GEOSummit, the Swiss geoinformation trade fair in Bern.

What do monitoring a national park, identifying suitable building locations and managing a vineyard have in common? All these activities, and a wide range of others, can be carried out more quickly and comprehensively by using aerial and satellite images. The artificial intelligence platform developed by startup Picterra allows anyone to extract crucial information from drone or satellite images – many of which are in the public domain – in a few clicks. It will be presented to the public and sector professionals tomorrow at GEOSummit in Bern.

The [system](#)'s basic algorithms were developed by Picterra's CTO Frank de Morsier. It can locate and count user-selected elements and spatio-temporal changes after quickly learning which objects to recognize. The machine interactively and rapidly compares the object's characteristics with the other elements of the image, or compares the basic image with other images of the location, in order to detect changes. "Although [artificial intelligence](#) (AI) has made huge strides in the fields of 'natural' language and text analysis, using AI specifically to analyze terrestrial imaging is almost virgin territory," said de Morsier, also lecturer at Geographic Information Systems Laboratory.

Human expertise at the heart of artificial intelligence

Users simply upload their orthomosaic – i.e., aerial images stitched together to form just one large image – and has also access to several sources of [satellite images](#) corresponding to his area of interest. He selects a few options from a drop-down menu and then pin-point some examples of the selected elements on the image. The process can then be

enhanced through the addition of other images. The system has a huge range of potential applications, for example in the agriculture, defense, finance, shipping, government, university and research sectors. Other platforms that allow users to compile and exploit aerial images exist, but Picterra has created a simple system that everyone can use for their own purposes. It therefore relies on human expertise, which sets the direction that machine learning then follows.

After it was founded in 2016, Picterra tested its system – which offers 5-centimeter resolution – using several real situations, including monitoring illegal logging in several African, Asian and South-American countries, tracking vine stocks in a large vineyard and detecting trees that are dangerously close to high-voltage cables. The startup has used the resulting expertise to develop a new, customizable system that anyone can use. It can observe areas of up to 2,000 km², which corresponds of the size of a satellite image. But the coverage is global: it can scan a surface of a few hectares as well as an entire continent. "For example, it would be perfectly possible for a citizens' association to use AI to analyze a beach and distinguish between organic waste and waste of human origin, or for a company to use a customized AI system to track its cargo all around the world," said Pierrick Poulenas, CEO.

The company also benefits from the liberalization of the space sector. The arrival of many companies able to build, launch and operate at low cost observation satellites, but also new types of equipment such as solar drones in low orbit. This has a direct impact on the cost of images, which has dropped while their spatial and temporal resolution has exploded. "In the next five years, high-resolution, real-time images of the Earth will be available. The market, within 10 years is estimated at several hundred billion dollars," says the CEO of the start-up of the EPFL Innovation Park.

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