Appu Shaji, CEO and Chief Scientist at Mobius Labs

Algorithms at altitude

So far, the tools to create actionable, high-resolution observations of earth have been in the hands of sophisticated users with deep pockets. Mobius Labs contends that next generation computer vision AI technology will not only simplify the user interface but also dramatically lower the price of entry, thereby enabling the democratization of satellite imagery.

Appu Shaji, CEO and Chief Scientist and Will Hannan, Chief Commercial Officer at Mobius Labs

Recently, there have been several headline grabbing examples of artificial intelligence being used to analyze satellite imagery. Earlier this year, a team of scientists from the University of Bath, the University of Oxford, and the University of Twente in the Netherlands took advantage of satellite cameras coupled with deep learning algorithms to track the movements and populations of African elephants.

In urban environments, researchers from MIT and the Qatar Center for Artificial Intelligence have developed a machine learning system that analyses high-resolution satellite imagery, GPS coordinates and historical crash data in order to map potential accident-prone sections in road networks.

Satellite imagery, combined with AI, also has a role to play in mitigating the impact of climate change. This includes assessing the risk of damage to buildings caused by severe weather events, such as cyclones and floods.

As all these examples demonstrate, there is enormous potential for AI when combined with satellite imagery and high-altitude photography. Some of these benefits involve simply counting and locating a certain category of objects. From wild animals roaming the wilderness, to container ships sailing from port to port, simply being able to quantify the number and position of each object offers valuable insights.

ZOOMING IN FOR GREATER DETAIL

The next level of analysis is the comparison of areas or objects at different moments in time. When comparing the pollution hotspots in a city from one month to the next, satellite imagery can help predict and pre-empt the impact on local populations. This is also true when examining geological features, where the technology can measure the impact of climate change on river courses or lake volumes and help reverse negative trends in the landscape.

The third level of analysis adds another layer of sophistication to the satellite AI mix. This is where there is an opportunity to connect artificial intelligence with the data modelling done by scientists who may not be AI experts themselves.

In the next few years, we should be able to achieve

Will Hannan, Chief Commercial Officer at Mobius Labs

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this goal, especially in research intensive fields such as climate change.

GETTING RID OF THE BOTTLENECKS

We will also see a reduction in the number of bottlenecks that prevent wider access to the technology. The first of these is price. Satellite imagery is still prohibitively expensive for many businesses, governments, and NGOs. Unsurprisingly, this is driven largely by hardware and launch costs which start at $10 million. Then there's the costly process of downloading digital images from space, although this is already falling dramatically making the technology increasingly affordable for a wider range of businesses. But even as costs are falling, organizations are struggling to turn imagery and data into actionable insights. The people with these skills—data scientists, data analysts and others— are in short supply. As a result, the benefits remain largely in the hands of big businesses in sectors such as agriculture, energy, insurance, and others.

To fill the gap, we've seen the arrival of data platforms that aggregate content from different platforms and then present it in a unified way to customers. But this still requires an in-house analytics team to process it. What's missing is the AI software in the middle that can take all this imagery and process it efficiently at a price that is affordable and accessible to non-data, non-AI specialists.

INTO A SUSTAINABLE FUTURE

This is where the latest generation of computer vision AI comes in. It acts as that middle layer, so that data platforms aren't selling pixels, but data with certain analytics already pre-computed that greatly simplify the user experience and lower the price dramatically.

The technology also does a lot of the heavy lifting upstream, quickly separating useful imagery from not so helpful content. This matters enormously when you can install the software on the satellites themselves thanks to power-efficient technology that is optimized for low-latency, low-data scenarios where every ounce of space hardware is critical.

This means that you don't waste energy and effort filtering out images that offer little or no value, such as views obscured by cloud cover. Approximately 70 percent of content gathered from satellites is essentially worthless for this reason.

At the end user level, recent advances in 'no-code' interfaces means that business users, rather than data specialists, can train algorithms in a matter of minutes, using dozens rather than thousands of images. By putting technology in the hands of people who understand the business, you open the door to new opportunities, new customers, and new markets.

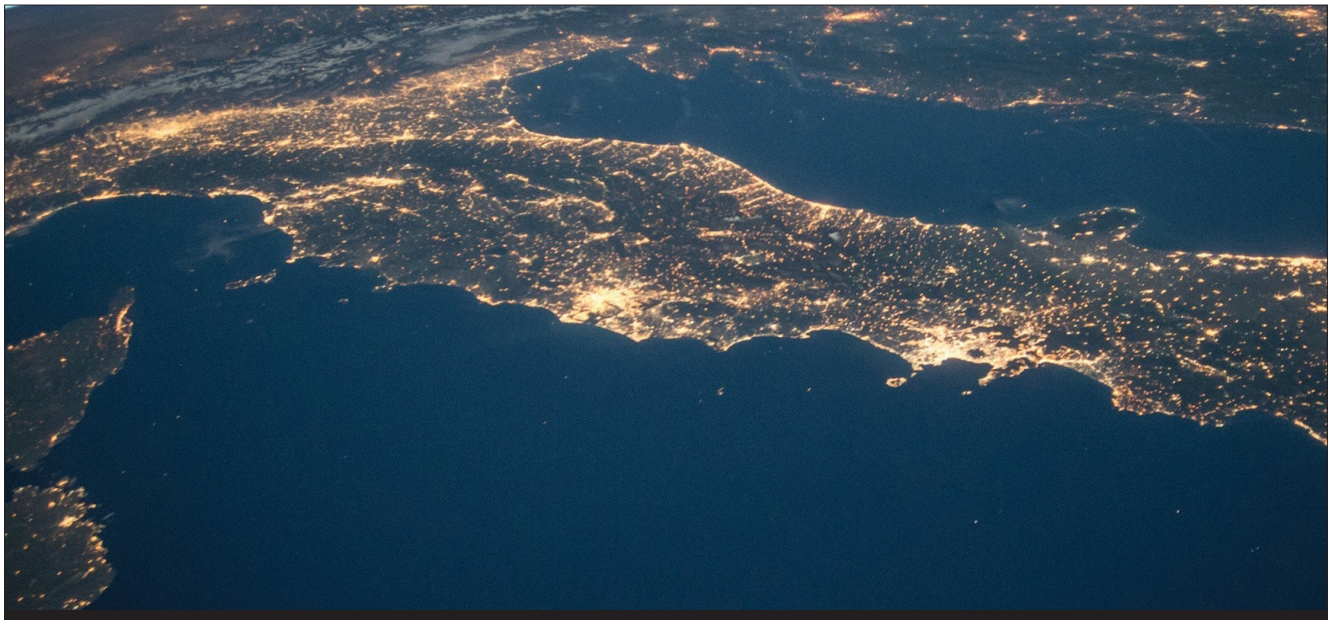
LOWER COSTS FROM LAUNCHPAD TO LAPTOP

Above all, next generation computer vision subtracts operational costs from satellite launchpad to knowledge worker laptop, transforming raw pixels into insights at a scale previously unavailable.

The result: we are at a tipping point in the democratization of satellite imagery and data which unlocks opportunities for organizations of all sizes including farmers, climate scientists, NGOs, and others responsible for the sustainable future of the planet

It's also good news for the commercial satellite imaging market which is expected to double in size from US $3.4 billion in 2020 to $6.34 million in 2026[1]. AI will play a key role in this growth, by enabling more people than ever to leverage insights from previously unobtainable and unaffordable data streams, and bringing unparalleled benefits to businesses, societies, and the planet. When it comes to the future of computer vision and satellite imagery, the sky's the limit.

[1] *"Commercial Satellite Imaging Market | 2021 - 26 | Industry Share ...." https://www.mordorintelligence.com/industry-reports/commercial-satellite-imaging-market*



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