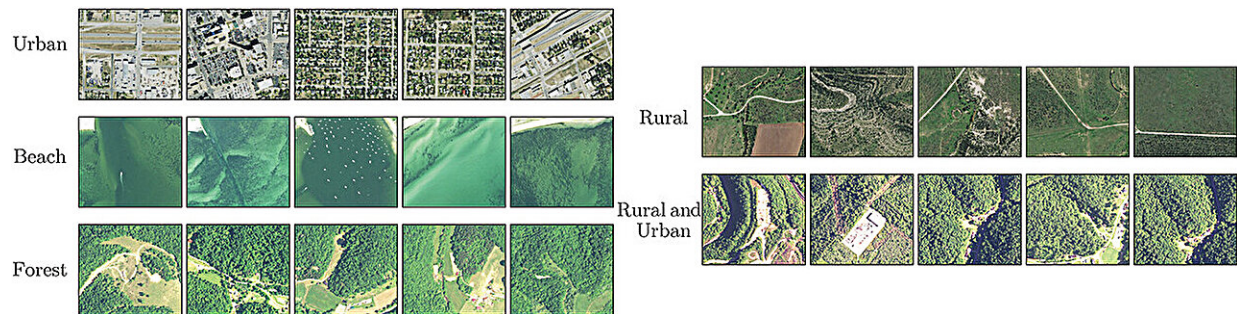


# Using AI to enhance satellite imagery to monitor the planet

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NAIP imagery patches 1–5 (left to right) for each geographical type. Credit: *Remote Sensing Letters* (2024). DOI: 10.1080/2150704X.2024.2318756

A [new method](#) to assess different satellite designs using a powerful AI technique to more cheaply monitor our planet from space has been published in the journal *Remote Sensing Letters*.

Thanks to an international team led by Swinburne University of Technology and leading provider of global Earth observation data, Planet Labs, the AI-powered method reduces the cost of Earth Observation satellites while keeping the quality of images high.

Traditionally, designing and operating Earth observation satellites involves trade-offs between the size, cost and quality of different hardware options.

Dr. Steve Petrie, Earth Observation Research Fellow at Swinburne, was part of the team developing the innovative method. "We used AI to compensate for compromises limitations in satellite hardware that degrade the quality of images," he says.

"The glass lens was the most difficult component to compensate for, suggesting that satellite designers should not compromise on the quality of the lens relative to the quality of other components."

Taking images of the Earth's surface is important for many applications, from monitoring [climate change](#) and biodiversity loss, to tracking [extreme events](#) like bushfires and floods.

Lowering the cost of Earth observation satellites will allow better tracking of these important phenomena.

Professor Alan Duffy, Swinburne Pro Vice-Chancellor of Flagship Initiatives says, "The new method demonstrates how AI can enhance images of Earth beyond the limits of the satellites themselves.

"This provides higher-quality data with potentially lower-cost satellites and can help drive the uptake of Earth Observation as a tool for everything from agriculture to mining.

"Swinburne is proud of the close collaborations it has nurtured with industry. This project is a wonderful example that brings together the best of Swinburne's Space Technology and Industry Institute researchers as well as leading Earth Observation companies like Planet Labs and EY to show how space can be used to help Earth."

Dr. Petrie hopes that the research collaboration with Planet Labs and EY can be further developed on future satellite-focused research projects.

"The project gave us experience in using AI to enhance satellite images, and those techniques can potentially be used across several Swinburne projects that involve [satellite imagery](#)."

**More information:** Jack White et al, Quantifying trade-offs in satellite hardware configurations using a super-resolution framework with realistic image degradation, *Remote Sensing Letters* (2024). [DOI: 10.1080/2150704X.2024.2318756](#)

Provided by Swinburne University of Technology

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