Pioneering new tools for **image analysis**

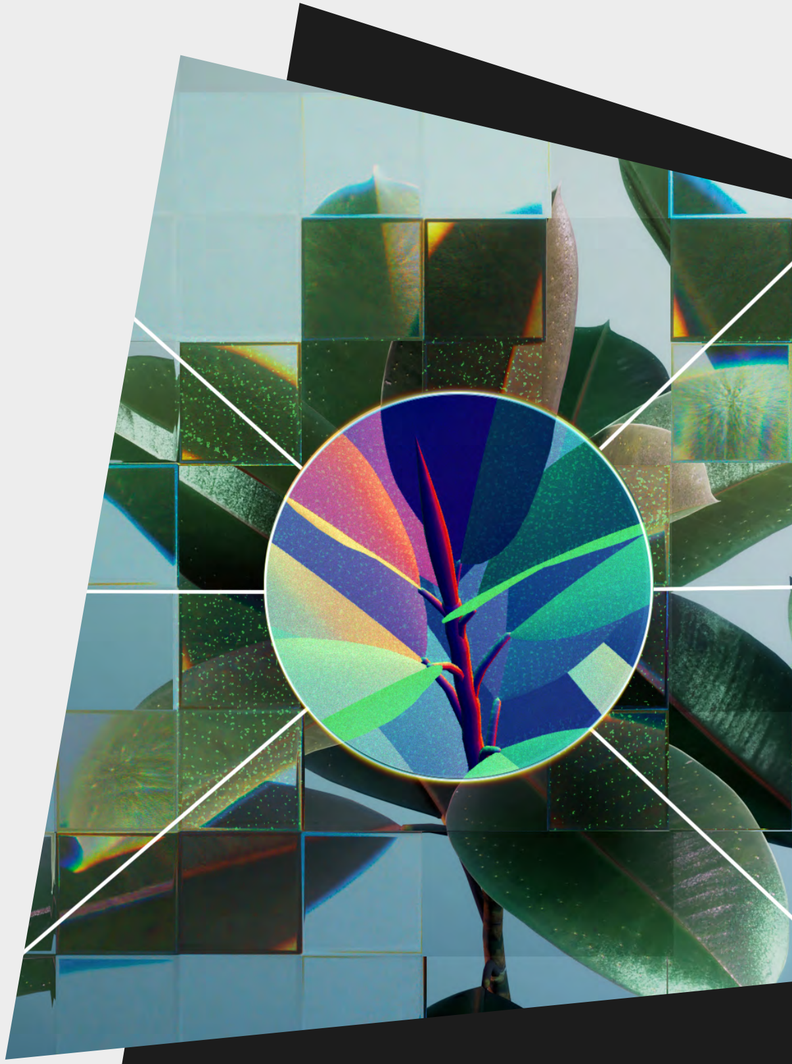
Image analysis is central to myriad research areas, from climate change and human history to medicine, microbiology and astronomy. Computer vision techniques are used to automatically extract useful information from images, saving researchers time and energy. However, many of the researchers who are analysing images are not computer vision experts: there is a knowledge gap between those developing the algorithms and those whose research can benefit.

Two new tools developed at the Turing are aiming to bridge this gap. The first, called **MapReader**, is a free, open-source software package written in the Python programming language. Created as part of the Living with Machines project (also see page 22), it is the first tool that enables historians to automatically find features in maps on a large scale. MapReader's key feature is to divide maps into patches – a more efficient approach than considering every map pixel individually. To demonstrate the tool's capability, the team has used it on over 16,000 19th century Ordnance Survey maps of the UK (digitised by the National Library of Scotland) to **identify buildings and railway infrastructure**, creating a visualisation of the growth of urban areas and the rail industry after the Industrial Revolution.

The second tool, called **scivision**, is a more general-purpose Python toolkit for analysing scientific imagery. Developed by a team at the Turing, the aim is to create a searchable, open-source catalogue of computer vision algorithms and image datasets for the wider research community – enabling algorithm developers to find image creators, and vice versa – as well as an interface that allows users to easily load the datasets and run the models. To showcase scivision's potential, the team is developing a series of **use cases**, including classifying plankton species in images of ocean samples (this began as a Data Study Group at the Turing with the Centre for Environment, Fisheries and Aquaculture Science (Cefas), which is now testing the resulting algorithm on its research ship), and adapting the MapReader tool to categorise the physical features of plants, which could, for example, help researchers quantify how plants respond to different climate conditions.

"What's really powerful about these tools is the way they are combining knowledge from the humanities and the sciences. It's a great example of cross-pollination within the Turing."

Katherine McDonough
Senior Research Associate and MapReader team member, The Alan Turing Institute



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