

# Flickr photo data used to predict people's locations

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Credit: Petr Kratochvil/public domain

A team of researchers with University College in England has found a way to use photo information attached to images uploaded to the sharing site Flickr to create an application that can predict where people will be

at a given time. In their paper published in the journal *Royal Society Open Science*, the team describes how they used millions of photos publicly available on the popular web site and the data attached to them to create a database which was then accessed to provide data for an algorithm they developed.

Many people are still unaware that a lot of modern cameras, especially those on smartphones, add data to [images](#) that can be accessed by others if those images are made publicly available—such as on file-sharing websites. One such data item is GPS coordinates which pinpoint where on the planet the photograph was taken, another is a timestamp specifying exactly when the photo was taken. In this new effort the researchers accessed such data by pulling photographs off of Flickr that had been put there by people wanting others to see what they had captured—in this case, by people in the United Kingdom. In all, the team obtained GPS and timestamp data from 8 million images taken by approximately 16,000 people and put it into a database for easy access.

Next, they created a [computer algorithm](#) that looked at all of the pictures taken by a single camera, noting all the locations where pictures had been taken—over and over again for every unique camera ID in their dataset. The algorithm then used that information to predict future movements based on past movements, of whole groups of people. To test it, they compared their results with a government survey taken to discern national travel patterns and found that the two agreed approximately 92 percent of the time. The team reports that they could also focus on individuals (or at least their cameras) and predict where that person might be at any given moment.

The research done by the team highlights both privacy issues and concerns regarding shared photographs and a new way for governments to track people movement, which could help with road building plans, or other transportation projects.

**More information:** Modelling human mobility patterns using photographic data shared online, *Royal Society Open Science*, Published 12 August 2015. [DOI: 10.1098/rsos.150046](https://doi.org/10.1098/rsos.150046)

## Abstract

Humans are inherently mobile creatures. The way we move around our environment has consequences for a wide range of problems, including the design of efficient transportation systems and the planning of urban areas. Here, we gather data about the position in space and time of about 16 000 individuals who uploaded geo-tagged images from locations within the UK to the Flickr photo-sharing website. Inspired by the theory of Lévy flights, which has previously been used to describe the statistical properties of human mobility, we design a machine learning algorithm to infer the probability of finding people in geographical locations and the probability of movement between pairs of locations. Our findings are in general agreement with official figures in the UK and on travel flows between pairs of major cities, suggesting that online data sources may be used to quantify and model large-scale human mobility patterns.

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