

Crowds for Clouds: Using an Internet Workforce to Interpret Satellite Images

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ABSTRACT

Before satellite images can be used to track land use and land cover change they need to be examined for clouds and cloud shadows. While computers provide an inexpensive way of interpreting satellite images, computer algorithms are only imperfectly suited for this task. The aim of this project is to explore outsourcing the cloud interpretation task to "turkers" - workers recruited via amazon.com's online job market known as "Mechanical Turk".

A labor market experiment was conducted with over fifteen hundred participants to examine worker accuracy and provide a proof of concept for this approach. Each turker completed a brief instructional module, then was presented with three satellite images we rated as "easy", "medium" or "hard" to classify. Images were divided into an eight by eight grid, and turkers needed to classify each tile as "impacted" or "not impacted" by cloud or shadow.

We find that turkers were more accurate than Fmask for some, but not all, tiles. Feedback from participants suggests that straightforward modifications of the training module and task could be expected to increase turker accuracy. As expected, accuracy varied with task difficulty. While we find that wage does not have a significant effect on accuracy, we find that other factors, such as being from the US, are significantly correlated. Some of these factors could be used to screen turkers so that only those most likely to have high accuracy are hired. Given the low cost of hiring turkers we believe this is a promising strategy for cloud interpretation.