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PORTALS
Computer Scientists Pull a Tom Sawyer To Finish Grunt Work

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How is this for low: Elite computer scientists are using highly addictive computer games to trick unsuspecting Web users -- possibly including children -- into toiling without pay for some of the world's richest companies on stupefyingly dull grunt work.

It's all true. Though, in fairness, nothing nefarious is going on at all.

The scientists are part of a minimovement known by the oxymoronic name of "human computation." The idea is that because there are many tasks that humans still do better than computers, why not just get people to do them? Often, the best way to do just that is to make a game out of it.

That was the insight of Luis von Ahn, a 28-year-old professor at Carnegie Mellon University who is the creative force behind a Web hit known as the ESP Game, at espgame.org. The site has had more than 130,000 visitors and has lately inspired other researchers to try the same thing.

The game links two random players via the Web. Both are shown the same picture, then have to type in possible keywords to describe what they see. If the keywords match, points are awarded; people have been known to play for hours.

What's really going on, though, is that a previously unlabeled picture collected off the Internet is being given keywords that can be used later to categorize or retrieve it.

Computers still perform woefully on this sort of "image recognition." There isn't a program in the world that can do what any three-year-old can: be shown pictures of a cow or a bridge or a pencil and consistently pick which is which.

Among the inspirations for the game, said Prof. von Ahn, was the realization from computer solitaire that people will happily diddle away endless hours at their machines. A key innovation in the ESP Game was the introduction of a scoreboard, which taps the competitive juices of the players and extends the addiction.

The esp game is not Prof. von Ahn's only contribution to the modern computing scene. He is also one of the developers of the Captcha, those distorted words you have to retype correctly before you can, say, open a new email account.

Prof. von Ahn clearly is on a career roll. Last fall, he was awarded a MacArthur Foundation "genius" grant; he was also just named a Research Fellow at Microsoft.Google has licensed the ESP Game and is now using it with its Google Image Labeler to ID its own massive collection of Web pictures.

Just as significantly, other researchers in other projects are starting to warm to the idea of using games to solicit human help. Douglas Turnbull, a graduate student at the University of California, San Diego, developed a game for classifying music. People supply text descriptions of brief passages for later use in a program intended to help with musical recommendations. Two other game-based efforts are going to be discussed at an upcoming convention of music researchers, he said.

The game approach has limitations. The chief one being that when two people play a game, it tends to produce the lowest common denominator of responses, because the points are won when the player comes up with a term someone else also chooses. Dan Ellis, a Columbia University researcher who with graduate student Michael Mandel is working on a music-oriented game, said that in his own playing, he learned quickly to avoid clever terms and stick to the basics.

Another limitation with the game approach is that lay players usually are of no help at all with technical or scientific images. How many nonscientists would be able to spot and then accurately label a molecule of guanine?

Prof. von Ahn agreed that the gaming approach works best for relatively simple tasks. Still, this notion of human computation is beginning to infiltrate other computer corners. Google is now hinting that in Web searches, for example, humans might have a role in refining search results, weeding out low-quality pages.

In addition, Amazon.com offers a site called "Mechanical Turk" (named for a fake 18th-century chess-playing robot), that is an outsourcing service for people to perform simple tasks under contract. The pay is shockingly low -- write a summary of a movie plot for 10 cents; answer a question about computers for two cents. It's hard to know which is worse: paying next to nothing, or, as with the games, paying nothing at all.

To what extent is this use of humans to dot the I's that computers can't themselves dot a retreat from the grand idea of computer scientists to have machines spare people from just this sort of work?

Prof. von Ahn says it's just a stopgap; that in 20 years, at least in the case of vision and images, all of these problems will have been solved, and we won't need the human labor. But he concedes that result is contingent upon a research breakthrough, the likes of which he can't even begin to describe. Absent such a bolt from heaven, even 20 years might not be enough time, at least in the field of computer vision and image recognition, and human beings will likely be needed for much longer.

"We really are just inching along here," he says.

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