

**Artificial artificial intelligence, which has been around since the 18th century, is finding its place in the cyber age.**

IF YOU are a tourist interested in seeing a baseball game while in New York, you can find out which of its teams are in town simply by sending a message to AskForCents.com. In a few minutes, the answer comes back, apparently supplied by a machine but actually composed by a human.

Using humans to process information in a machine-like way is not new: it was pioneered by the Mechanical Turk, a famed 18th-century chess-playing machine operated by a hidden chessmaster. But while computers have since surpassed the human brain at chess, many tasks still baffle even the most powerful electronic brain.

Any computer might be able to find you a baseball schedule but they cannot tell you if the Yankees are in town. Nor can they tell you whether sitting in the bleachers is a good idea on a first date. AskForCents can, because its answers come from people. "Whatever question you can come up with, there's a person that can provide the answer - you don't have the inflexibility of an algorithm-driven system," says Jesse Heitler, who developed AskForCents.

Mr Heitler was able to do this thanks to a new software tool developed by Amazon, the online retailer, that allows computing tasks to be farmed out to people over the internet. Aptly enough, Amazon's system is called Mechanical Turk.

Amazon's Turk is part toolkit for software developers, and part online bazaar: anyone with internet access can register as a Turk user and carry out the Human Intelligence Tasks (HITs) listed on the Turk website ([mturk.com](http://mturk.com)). Companies can become "requesters" by setting up a bank account that will pay out fees and then posting their HITs. Most HITs pay between one cent and \$5. So far, people from more than 100 countries have performed HITs, though only those with US bank accounts can receive money for their work; others are paid in Amazon gift certificates.

Mr Heitler says he had previously tried to build a similar tool but concluded that the infrastructure would be difficult to operate profitably. Amazon already has an extensive software infrastructure designed for linking buyers with sellers, however, and the Turk simply extends that model. Last November Amazon unveiled a prototype of the system, which it calls "artificial artificial intelligence". The premise is that humans are vastly superior to computers at tasks such as pattern recognition, says Peter Cohen, director of the project at Amazon, so why not let software take advantage of human strengths?

Mr Cohen credits Amazon's boss, Jeff Bezos, with the concept for the Turk. Other people have had similar ideas. Eric Bonabeau of Icosystem, a US firm that builds software tools modelled on natural systems, has built what he calls the "Hunch Engine" to combine human intelligence with computer analysis.

The French postal service, for example, has used it to help its workers choose the best delivery routes and pharmaceutical researchers are using it to determine molecular structures by combining their gut instincts with known results stored in a database. And a firm called Seriosity hopes to tap the collective brain-power of the legions of

obsessive players of multiplayer online games such as World of Warcraft, by getting them to perform small real-world tasks (such as sorting photographs) while playing, and paying them in the game's own currency.

Alpheus Bingham, head of InnoCentive, an online matchmaking service for scientists and challenging problems, is impressed by both Icosystem and Seriosity because, he says, "there's quite a bit of substance in this - there are some things in areas of pattern recognition that humans are just wired for, and they get it instantly". The challenge is finding the people and then connecting them up using existing computer networks.

Though the Turk officially remains a prototype, scores of companies have used it. Amazon itself uses the Turk for tasks such as labelling pictures on its A9 search engine, or brand preferences. AskForCents exists because of the Turk, as does CastingWords, a service that transcribes spoken audio files using people who have computer access and time to kill - housewives, night-shift security guards and so on.

"It's a labour-intensive business. We could not do this without the Turk," Nathan McFarland, the founder of CastingWords, says.

He says his firm has transcribed thousands of podcasts in only a few months and he has left his previous job to concentrate on the business. Mr McFarland notes that some people try to outwit the Turk, by using software scripts to download a translation assignment, pass it through an online translation service such as AltaVista's Babel Fish, and then offer it up as finished work.

That's an easy one to catch, he says, but for other types of services such spoofs in which people try to use "real" artificial intelligence in place of the more accurate, artificial kind, might be less obvious.

How much should humans expect to be paid for renting out their brains in this way? Business users of the Turk say they **are unsure what they should pay for the simple answers they want but they typically offer only a few cents.** Even online, however, no one likes to pick up a penny. Mr Heitler says requests at that low rate generally go unanswered, though two cents a query seems to spark interest.

But even complicated tasks rate only a few dollars. iConclude, a software start-up aiming to automate corporate technical support, is using the Turk to evaluate developers who can help write its repair tools. It used the Turk to source a list of recommended fixes for common problems in IIS, Microsoft's widely used web-server software. One respondent submitted a superbly thought-out 20-step process made up in Visio, a software tool for making schematics. For this, iConclude paid \$5. "If we'd hired a consultant, we would have paid \$1000-\$2000," says Helen Tang of iConclude. "I was flabbergasted."

It all sounds promising. But the market may have cooled to the Turk, at least for the moment. While Amazon says it has executed "tens of millions" of HITs, there were only 13 active HITs on a recent day and some requests go unanswered. Although it sounds impressive, it may be that, like its 18th-century namesake, there is less to the modern-day Mechanical Turk than meets the eye.