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Sharing robot minds and bodies over the Web could take AI to the next level

INTELLIGENT as people are, we just aren't bright enough to create a machine in our own image. Researchers say the quest for artificial intelligence is floundering because the problems are too great for any individual group to solve on its own. Some researchers are now saying the solution is to let anyone and everyone get in on the act.

To do this, they propose that the AI community breaks away from the tradition of only publishing results in journals, and instead makes all AI software and robots available over the Internet and accessible even to complete novices. In short, they say that for AI to advance, the entire field needs to be democratized. Only by doing so will we finally achieve the revolution that AI has promised for so long.

The idea is part of a project called the World Wide Mind, run by Mark Humphrys and his team of computer scientists at Dublin City University. He believes that in order to make artificial systems complex enough to develop human-like intelligence, this level of collaboration is vital.

In the past, AI researchers set out to make complete robotic systems capable of moving and sensing the world and behaving intelligently. "But AI has gone away from building complete systems to building subsystems," says Humphrys. These include modules for vision, navigation, problem solving and locomotion.

There are a few exceptions, such as the Cog Project headed by Rod Brooks at the Massachusetts Institute of Technology's Artificial Intelligence Laboratory. This aims to build a humanoid robot with the intelligence of a two-year-old child. "But this is pushing the limitations of what an individual team can build," says Humphrys.

To allow researchers to break through these limits, Humphrys has developed a computer program that will let them post their research interactively on the Internet. The program means any piece of AI control software, or "mind" as he calls it, can be set up for others to use. Similarly, physical descriptions of robots can be posted on the Internet as "bodies", even if they've never actually been built.

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Any user, regardless of their location, can then link different minds with different bodies to see what behaviour they produce. "We have already demonstrated that one person's mind can run in another person's virtual body," he says.

Initially, actual robot bodies will not be connected to the Web, says Humphrys. Trials will start with simulations or virtual robots existing in virtual environments.

Humphrys says his system will let researchers do more than just try out a variety of minds in robots. He has written the program so that different vision, locomotion, sensing and problem-solving systems can be linked together as components of a larger mind. By doing this, he hopes AI researchers can achieve levels of complexity far beyond what they could attain through their individual efforts.

"The problem with building a mind this way is that we still don't have a clue what the components should be or how they should interact," says Brooks. "Humphrys is taking a wild stab at these issues and will most likely be wrong in many crucial ways." Humphrys concedes that theoretical breakthroughs are still needed before artificial intelligence can hope to produce key attributes like consciousness.

The World Wide Mind will not solve all of AI's woes, he adds, but he believes it's a necessary step towards more complex - and hopefully more advanced - AI systems. The project should also help fledgling researchers get up to speed. Instead of being stuck with simple robots and rudimentary algorithms, they could plug in and play with the big boys.

The software will be available free to download from the Web by the end of the year.

Duncan Graham-Rowe

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