



Singapore University creates robot that can build flat-pack Ikea furniture

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Scientists from Nanyang Technological University (NTU) in Singapore, have developed a robot that can assemble a flat-pack Ikea chair.

The unit was developed by Assistant Professor Pham Quang Cuong and his team from NTU's School of Mechanical and Aerospace Engineering. It is designed to mimic the human form, with "eyes" in the form of a 3D camera, "arms" made from parallel grippers and force sensors on the wrists to determine how strongly the "fingers" should grip the parts, and how powerfully they should push objects into contact with each other.

In tests, it was able to assemble Ikea's [Stefan chair](#) in 8 minutes and 55 seconds, after taking 11 minutes and 21 seconds to plan its strategy.

The robot is made from materials that can be bought off the shelf and programmed using algorithms from three open-source libraries.

It begins the assembly process by taking 3D photos of the parts laid out on the floor to generate a map of their estimated positions.



Cuong said: “For a robot, putting together an Ikea chair with such precision is more complex than it looks.

“The job of assembly, which may come naturally to humans, has to be broken down into steps, such as identifying where the chair parts are, the force required to grip the parts, and making sure the robotic arms move without colliding with each other.”

Professor Cuong said that in the future he was planning to integrate more artificial intelligence into this approach to make the robot more autonomous so it can “learn the steps of assembling a chair through human demonstration or by reading the instruction manual, or even from an image of the assembled product”.

The project’s findings were [published](#) in the journal *Science Robotics*.

Image courtesy of Nanyang Technological University