Bees can solve counting tasks with very small numbers of nerve cells in their brains, according to a study.

In order to understand how bees count, the researchers at Queen Mary University of London in the U.K. simulated a very simple miniature ‘brain’ on a computer with just four nerve cells – far fewer than what a real bee has.

The ‘brain’ could easily count small quantities of items when inspecting one item closely and then inspecting the next item closely, which is the same way bees count. This differs from humans who glance at all the items and count them together.

In the study, published in the journal *iScience*, the researchers propose that this clever behaviour makes the complex task of counting much easier, allowing bees to display impressive cognitive abilities with minimal brainpower.

Previous studies have shown bees can count up to four or five items, can choose the smaller or the larger number from a group and even choose ‘zero’ against other numbers when trained to choose ‘less’.

They might have achieved this not by understanding numerical concepts, but by using specific flight movements to closely inspect items which then shape their visual input and simplifies the task to the point where it requires minimal brainpower.

**Right wiring**

This finding demonstrates that the intelligence of bees, and potentially other animals, can be mediated by very small nerve cells numbers, as long as these are wired together in the right way.

The study could also have implications for artificial intelligence because efficient autonomous robots will need to rely on robust, computationally inexpensive algorithms, and could benefit from employing insect-inspired scanning behaviours.

“Our model shows that even though counting is generally thought to require high intelligence and large brains, it can be easily done with the smallest of nerve cell circuits connected in the right manner,” said Ms. Vera Vasas from Queen Mary University of London.

“We suggest that using specific flight movements to scan targets, rather than numerical concepts, explains the bees’ ability to count,” Vasas said.