Simulating two types of brain cells may allow robots to navigate in a new way

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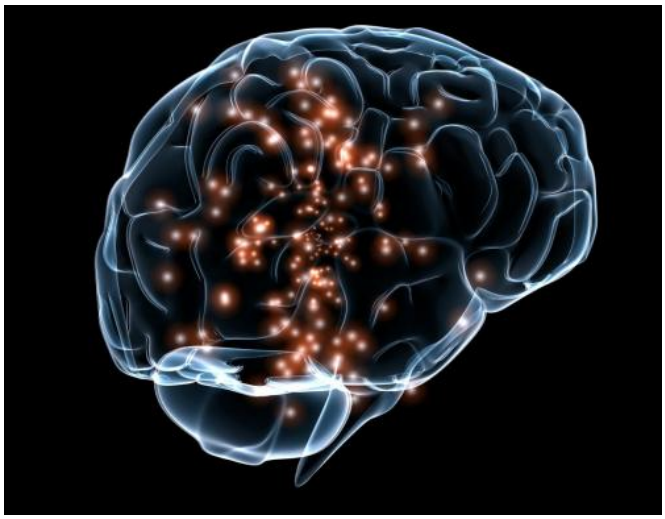

Credit: Wikimedia Commons

A team of researchers with Singapore's Agency for Science, Technology and Research has developed a new way to allow robots to navigate on their own. It is based on mimicking two types of neural cells in the brain, and as *MIT Technology Review* reports, initial tests indicate the approach might lead to robots that are able to adapt as an environment changes, allowing for a more robust navigation system.

Prior research (which led to a Nobel Prize in medicine last year) has shown that there are two types of neural cells in the brain, which have been called "grid" and "place" cells. Grid cells help to put together the concept of three dimensional space via a grid of sorts, which makes it possible for a human or other animal to keep track of where it is in the physical world. Place cells on the other hand are involved in recognizing certain physical places, such as a certain cage or a neighborhood. The two types of cells do not do it all of course, but work with other cells in the brain to provide for an extremely robust navigation system—one capable of adjusting to changes that would stymie modern robots that learn using conventional neural networks.

The team in Singapore took this idea and implemented it in software and then added it to an existing neural network used by an autonomous robot to make its way around. They tested the robot by letting it roam around their office and report that while the results are not yet as good as those of a standard neural network, the virtual cells did work as envisioned (they mimicked the natural versions) which suggests some tweaking my lead to a whole new type of navigation system.

In addition to offering hope for an improvement in robot navigation, the findings by the team also show that using such an approach can help to better understand how the brain works as well—and, it suggests that other types of brain activity might be copied too—in software or perhaps dedicated devices that serve the same functions for robots as parts of the brain do for us humans.