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News

Artbots show talent

Brain cells draft portraits via robot more than a thousand kilometers away.

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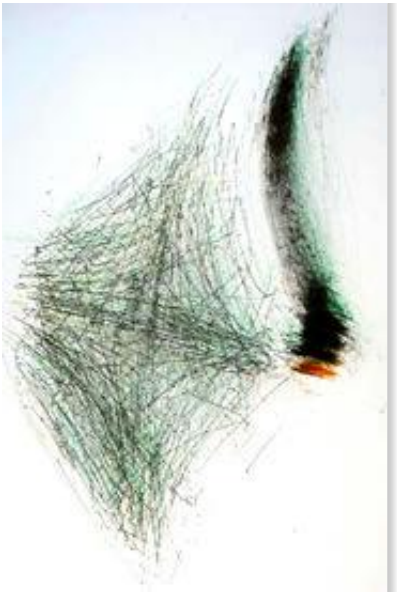

Culture shock: brain cells in Atlanta drew this portrait in New York.

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They may look like mindless scrawls. But the portraits sketched by a robotic arm in New York's Eyebeam gallery are actually the creation of brain cells - growing more than 1,300 kilometres away.

The cultured culture - entitled MEART - is staring in ArtBots: The Robot Talent Show in Manhattan's Chelsea art district. The exhibition showcases artists' increasing use of electronic and mechanical robotic technology.

Such a display of robot creativity "is a counter-example" to the number-crunching, warring drones often portrayed in films and books, explains the exhibition's curator Douglas Repetto. He plans to make Artbots an annual event.

MEART is the product of a collaboration between SymbioticA, an art-science group led by Guy Ben-Ary of the University of Western Australia in Perth, and Steven Potter's neuroscience lab at the Georgia Institute of Technology in Atlanta.

Its spider-like hinged arm is connected via the Internet to a dish of embryonic rat brain cells growing in Potter's Atlanta lab. The cells live on a grid of 64 electrodes called a multi-electrode array (MEA) that fires electrical signals into the cells - or detects those that shoot naturally along them.

Visitors to the gallery are invited to pose for MEART. A digital image of MEART's initial doodles is subtracted from a digital photo of them. The difference between the images is converted into a grid of 64 pixels; a high-value pixel represents a spot that is dark on the original but remains blank on the paper.

Every second, the 64 pixel values are beamed to the growing brain cells, converted into electrical signals and zapped into them via the corresponding 64 electrodes. After a pause, each electrode then measures the electrical signals generated by the nerve cells' in response to the stimulation, and shoots this information back to the robotic arm.

High electrical activity in one region of cells sends the robotic arm towards the corresponding area of the canvas to scrawl with one of three pens. "They are scribbles," concedes Ben-Ary, "but

aesthetically they're beautiful."

Live and learn

MEART's sketchy efforts "are definitely furthering the science", says Atlanta lab member Douglas Bakkum. The team is trying to figure out how groups of nerve cells communicate and learn like a fully formed brain.

Signals from the nerve cells guide the robot arm.

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Using data collected throughout the show, Bakkum hopes to work out whether, for example, cells that are stimulated the most also respond more and hence direct the pen to an empty spot. These patterns are hard to tease out because of impulses that travel between the interconnected nerve cells.

Science aside, MEART's portraits are already winning fans in the art world. They will go on display at another New York gallery, The Tank, on 17 July. And the project is a strong contender for the robotic equivalent of the Turner prize - ArtBots visitors and artists are voting for their favourite machine. ■

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