

BATTELLE NEUROLIFE

2016 Nominet Trust 100 Winner

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2016

NEURAL TECHNOLOGY HELPING QUADRIPLÉGICS REGAIN MOVEMENT

By Battelle

Project URL: <http://www.battelle.org/>

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Ian Burkhart was just 19 when a wave tossed him onto a hidden sand bank, damaging his spinal cord and paralysing all his limbs. For the next four years he was unable to move any muscles in his arms or legs.

There are 250,000 Americans with spinal cord injuries, 47% of whom are quadriplegic like Ian. A 2004 survey asked 681 quadriplegics to rank functions that they would most like to have restored – recovering motion to the hands and arms topped the list.

The Battelle Memorial Institute and a team of researchers from Ohio State University started working with Ian in 2014 while developing Neurolife – a new technology that would bypass Ian's neuro signals to his hands, and send them to a computer instead. The computer could then connect to external electrodes that could stimulate Ian's arm.

It was no easy task. Ian's arm and hand muscles were weakened through years of immobility, and he spent months preparing for the project by stimulating and strengthening them.

The team then implanted a Neurolife device in Ian's motor cortex. This pea-sized sensor collects signals from over 100 billion neurons and transmits them to a computer, which then relays electric signals to Ian's arm through 130 electrodes embedded in a wearable sleeve.

Similar technology has allowed people to control robotic arms with their minds in the past, but Neurolife is the first example that shows restoration of movement to paralysed limbs and that is tailored to the user's own neural

commands. Ian can now pick up a glass, pour out its contents, and grasp a smaller object like a straw.

Neurolife currently works in a clinical environment, but the team at Battelle are planning to expand the project to a handful of other participants in the near future, with the hope that the system can ultimately be made portable. Learn more at www.battelle.org

Image courtesy of Simon Fraser University

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