

The Global Human-Machine Neural Network

Joel Neidig
ITAMCO
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R. G. LeTourneau once said, “The pebbles of knowledge must be bonded together by the cement of experience.”

What if we could permanently connect the knowledge contained in digital devices with the experience and knowledge of humans? The Internet of Things—device-to-device connections—is a reality in manufacturing and the future can hold human-to-machine and even human-to-human connections via common protocols and neural networks.

To make human-to-machine connections, humans and machines must speak the same language, using protocols similar to MTConnect®. MTConnect is a machine-to-machine protocol that provides a standard schema and a common definition (name, units, values, etc.) that is readable by humans and machines. These functions break down the human language barrier through consistent translations and definitions, because words do matter. Just imagine if we could share knowledge freely and uninhibited by the constraints of our current communication liabilities, economic restraints and social inequalities. In addition to the need for a common language, human-to-machine and human-to-human communication is dependent on neural networks. A neural network is a computer system modeled on the human brain and nervous system.

Human-to-machine communication has been accomplished on a small scale in medical breakthroughs. For example, a paralyzed man is now able to translate thought into movement, but it requires a physical connection between medical implant and a device to accomplish this.¹ A Global Human-Machine Neural Network would cut the physical cord, bringing human neurons and software together. Connecting such a neural network requires the most secure peer-to-peer and end-to-end encryption, such as blockchain technology.

From its release in 2009, bitcoin, a digital currency, has been supported by blockchain technology. Blockchain provides a digital ledger that records every bitcoin transaction that has ever occurred. Since then, blockchain has been used in multiple domains, including a permanent, transparent ledger system for decentralized crowdfunding, decentralized and shared social networks, sales data compilation, rights data storage, and digital use and payments traceability for content creators, such as musicians.

The backend operating environment for blockchain has historically been confined to desktop computers, workstations, and servers. However, because devices are becoming more advanced with faster processors, larger storage, larger memory capacity, and reliable network connections, cryptography processing capabilities can be integrated into the neural network software and devices themselves, thus creating a secure environment for human-to-human or

human-to-machine interaction. Only those with permission to access the information would be able to do so.

The Global Human-Machine Neural Network doesn't hold promise only in medicine but in manufacturing as well. For example, remotely controlling a factory cell of collaborative robots with Microsoft HoloLens mixed reality headset.

For the future of manufacturing, we must embrace not only the machine connection but the human connection as well.

¹www.npr.org/sections/health-shots/2016/04/13/473821367/technology-helps-a-paralyzed-man-transform-thought-into-movement