3 ways neuroscience and AI can work together to help us understand how we think

The meteoric success of deep learning showcases how insights from neuroscience—memory, learning, decision-making, vision—can be distilled into algorithms that bestow silicon minds with a shadow of our cognitive prowess.

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Here are three ways AI is giving back.

1. Wrangling Data

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For mapping neural connections, detailing how neurons connect physically is rapidly becoming old-school; the trick now is to further correlate brain atlases to other functional maps such as brain-wide gene expression over increasingly longer timescales.

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2. Solving Senses and Movement

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AI models are acting as virtual brains to guide hypotheses and experiments. Rather than testing hypotheses immediately on animals, AI models can act as a middle stand-in that captures a basic representation of brain activity. These brain simulations allow "dry-runs" to perturb neural activity and observe what happens, without sticking electrodes into people.

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3. Cracking Neural Codes

Although much more complicated, the same strategy for solving senses and movement can also help crack more abstract brain functions. For example, mimicking the neural circuits underlying memory in computer chips could potentially off-load memories or other higher cognitive processes onto "memory patches" to be delivered back in old age or after brain damage. DARPA has these experiments underway.

Read full, original post: Three Invaluable Ways AI and Neuroscience Are Driving Each Other Forward