Artificial Intelligence: A Hands-On Introduction

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BUSINESS DAY

Google's AlphaGo Defeats Chinese Go Master in Win for A.I.
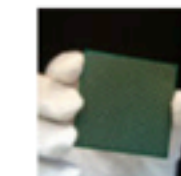
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By **PAUL MOZUR**   MAY 23, 2017

Ke Jie, the world's top Go player, reacting during his match on Tuesday against AlphaGo, artificial intelligence software developed by a Google affiliate. China Stringer Network, via Reuters
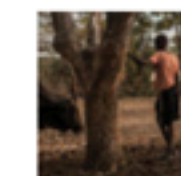
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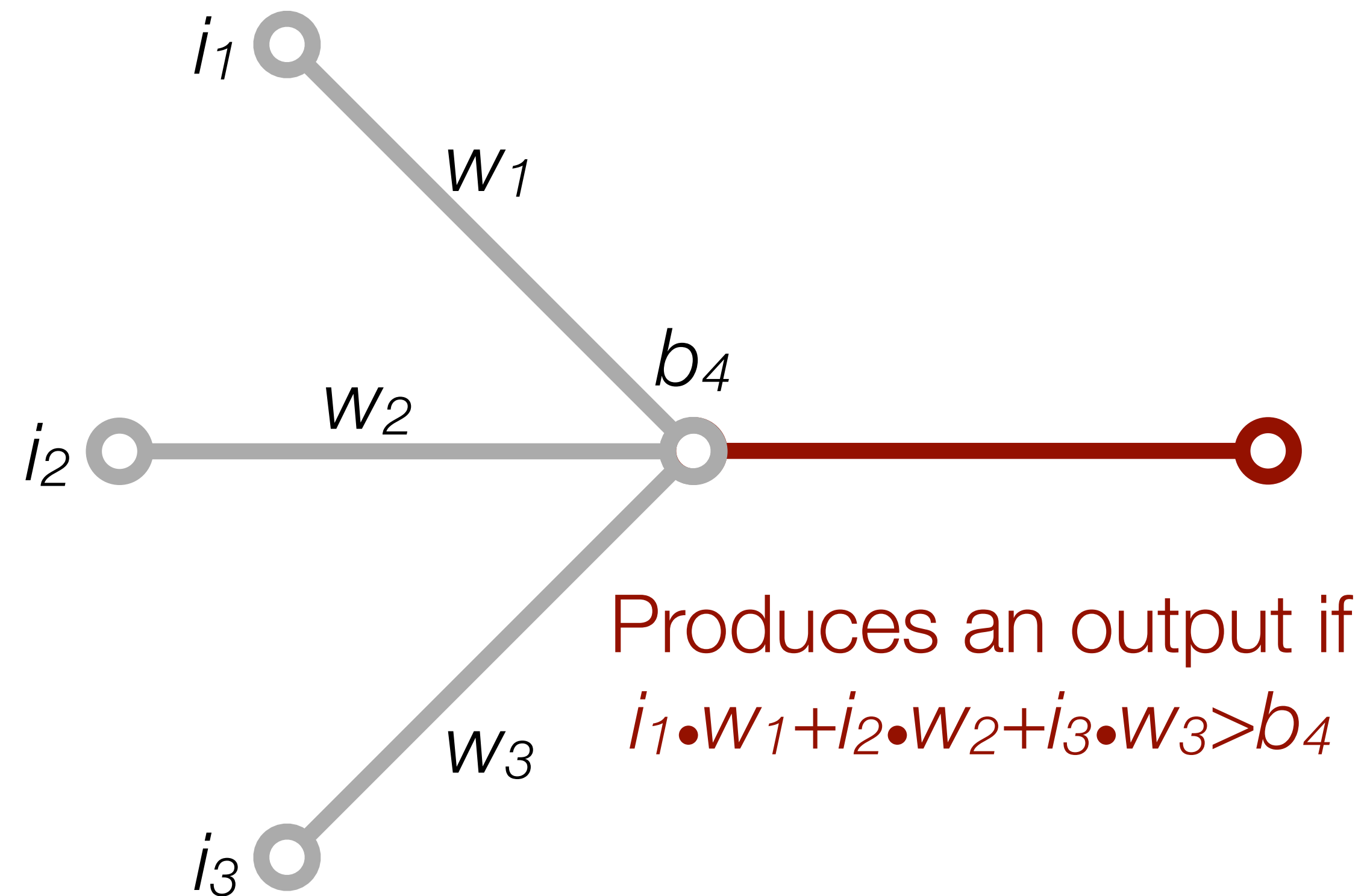**China's Intelligent Weaponry Gets Smarter** FEB. 3, 2017

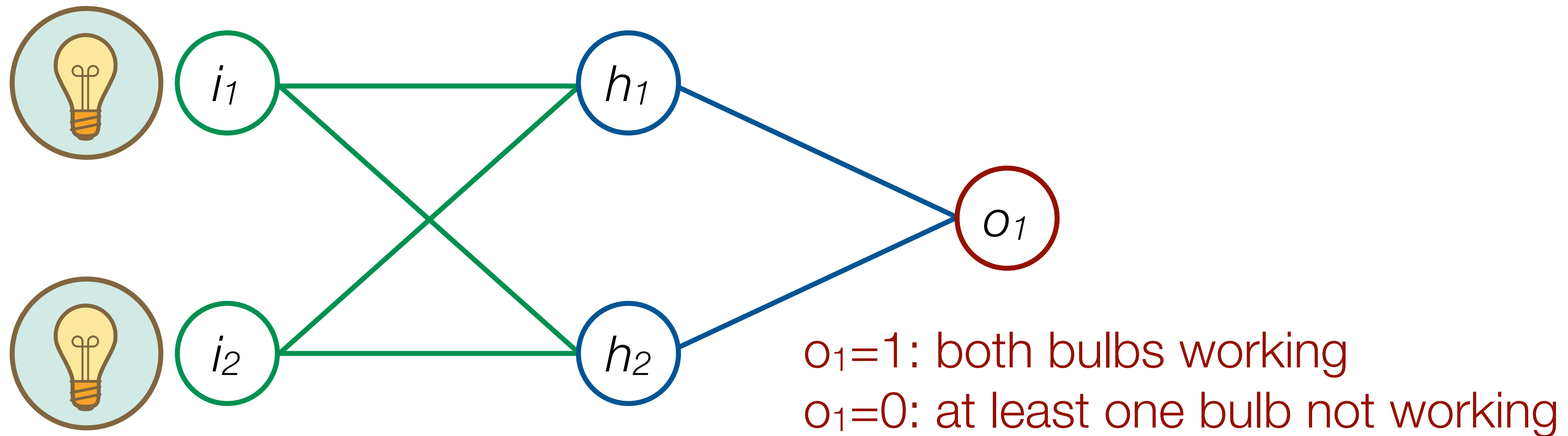THE FUTURE OF WORK
The Future of Not Working FEB. 23, 2017

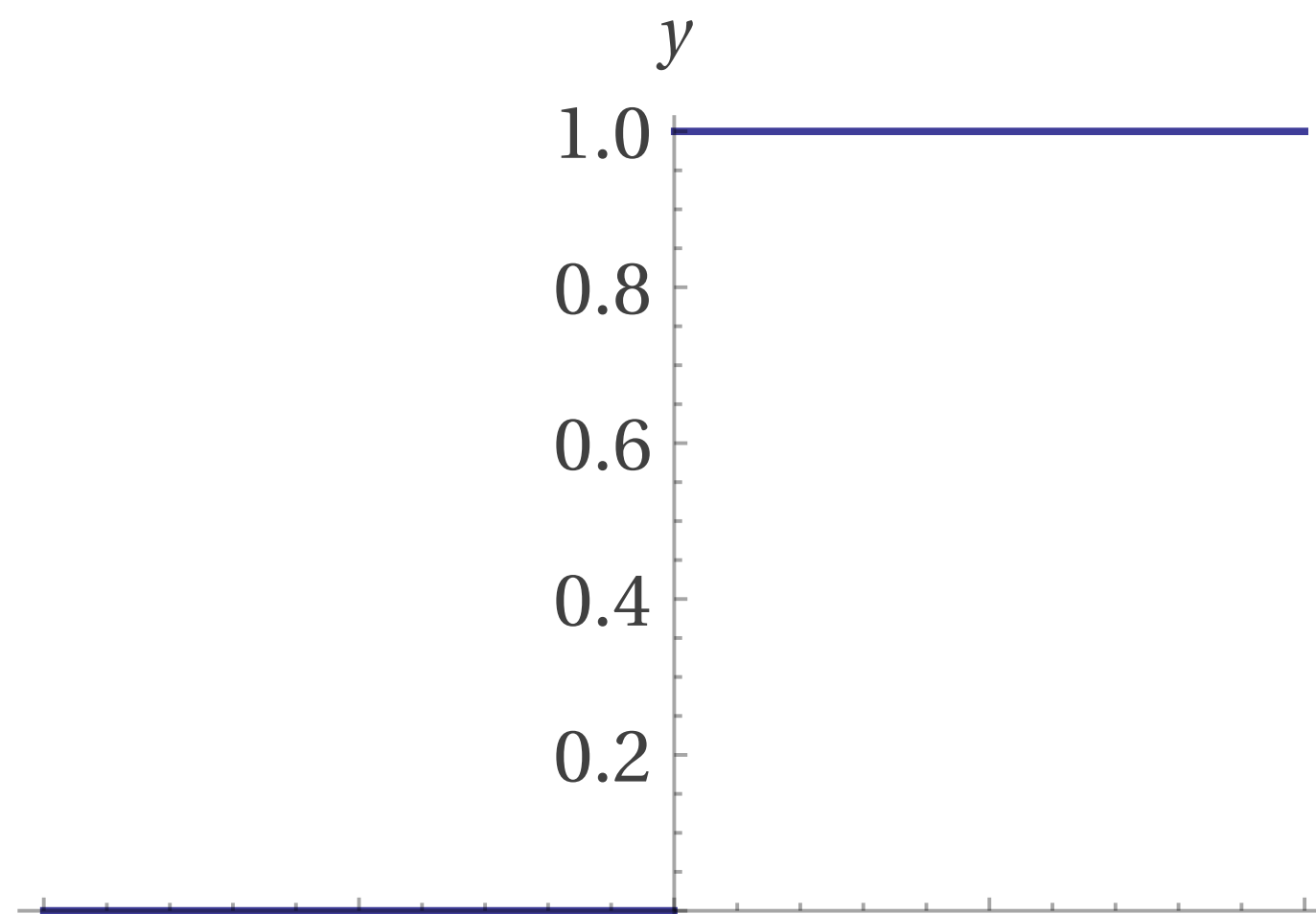**Master of Go Board Game Is Walloped by Google Computer Program** MARCH 9, 2016
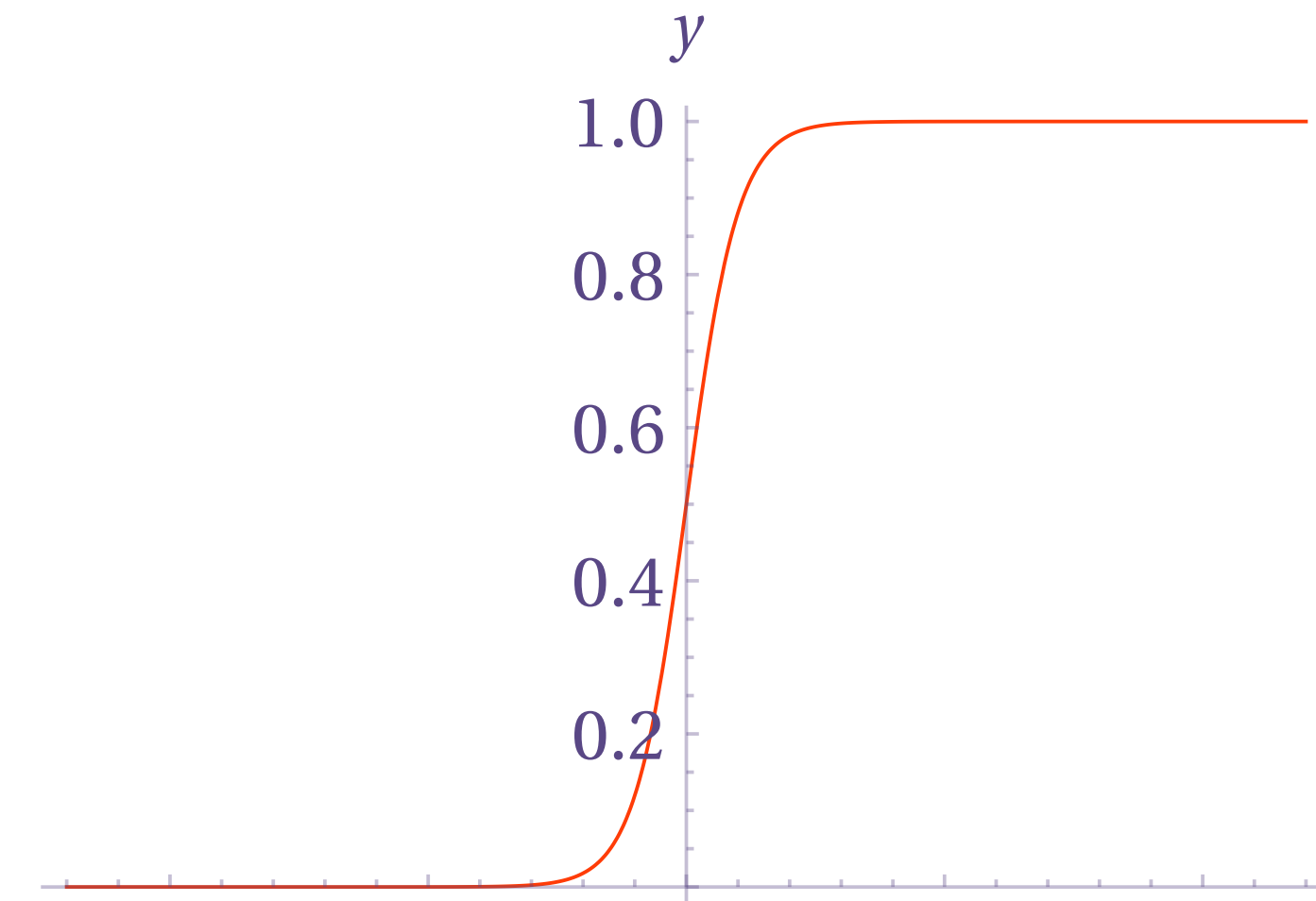
Simple McCulloch–Pitts/Perceptron Model

Produces an output if
$i_1 \cdot w_1 + i_2 \cdot w_2 + i_3 \cdot w_3 > b_4$

A Simple Example: A Light Bulb Tester

$o_1=1$: both bulbs working
$o_1=0$: at least one bulb not working

Threshold Function

Based on step function

Based on hyperbolic tangent function

$$\frac{e^x - e^{-x}}{e^{-x} + e^x}$$

Backpropagation

- Run the network for a given input

- Calculate the difference between the output produced by the network and the desired output - this is the *error*

- Change the weights by a certain percentage in the direction indicated by the error (i.e. increase or decrease to make the error smaller)

  - This percentage is called the *learning rate*

- Repeat for all inputs until the error is within the desired range

Using brain.js (https://github.com/harthur/brain): http://tinyurl.com/mlti17nn01

A Neural Network Playground:
http://tinyurl.com/mlti17nndemo

Returning to brain.js
http://tinyurl.com/mlti17nn02

Using brain.js for Image Recognition:
http://stackabuse.com/neural-networks-in-javascript-with-brain-js/
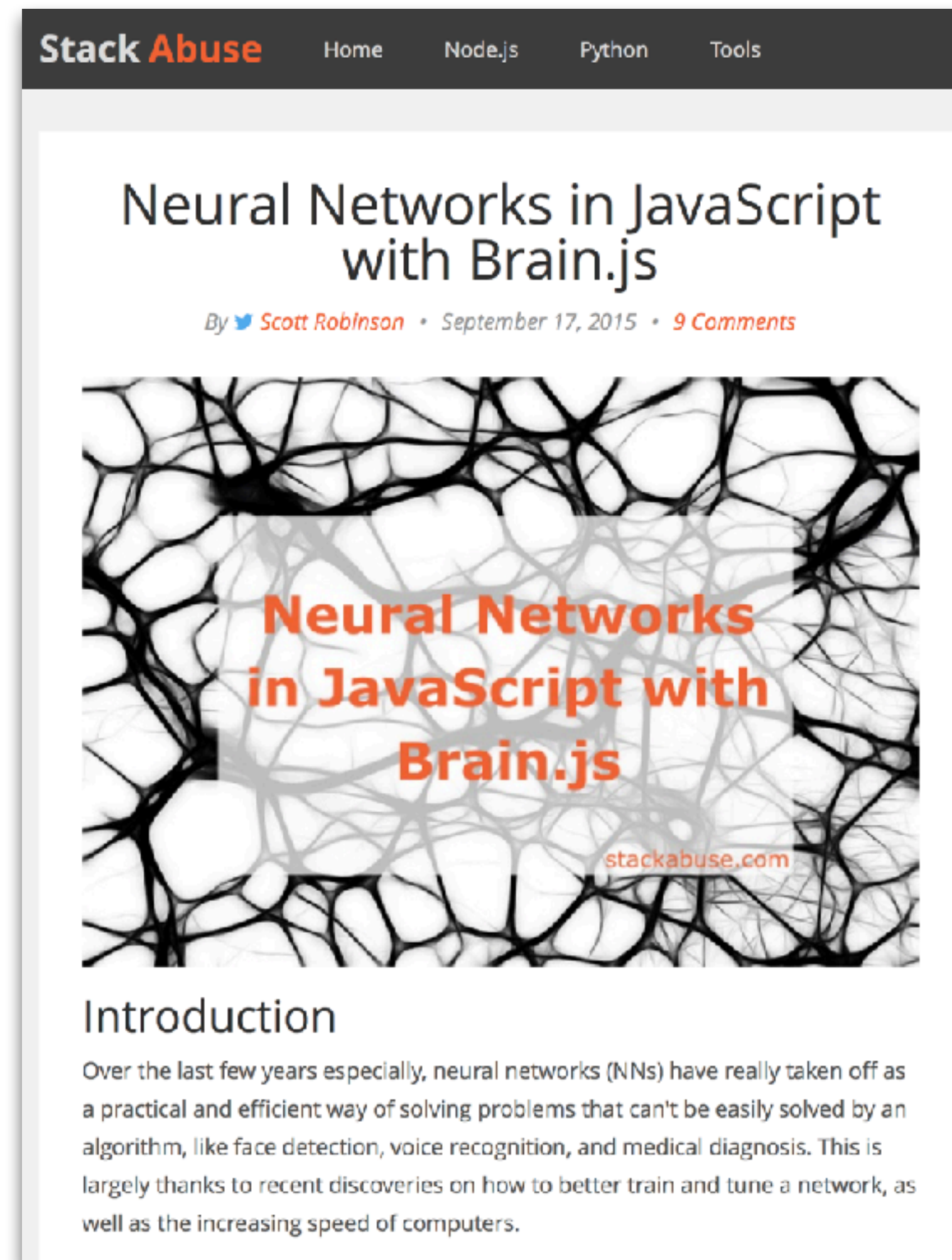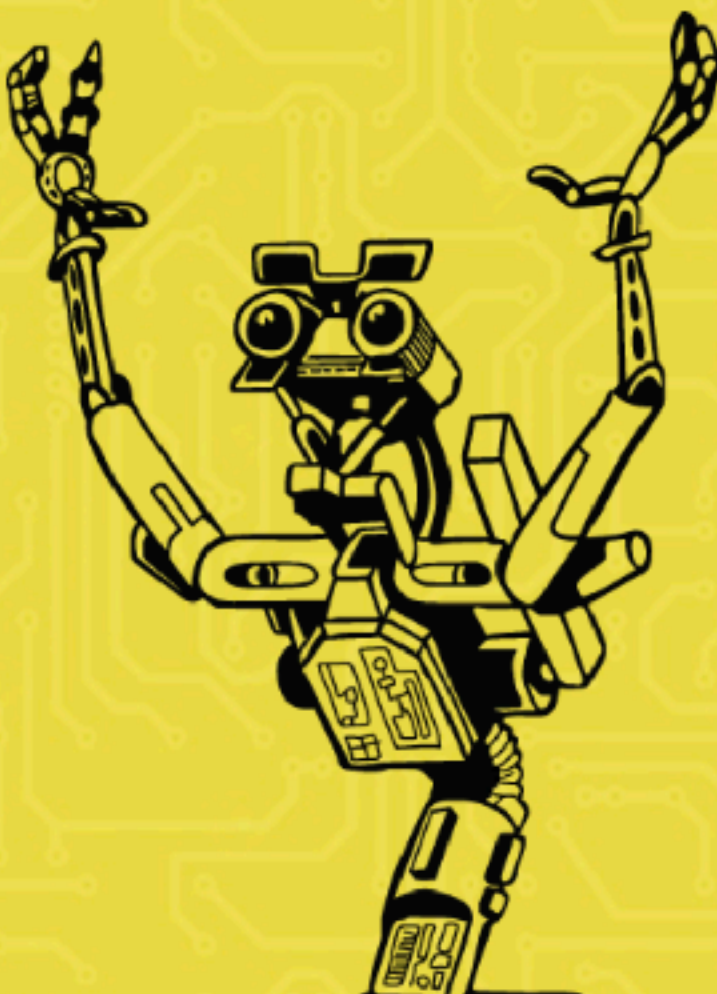
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