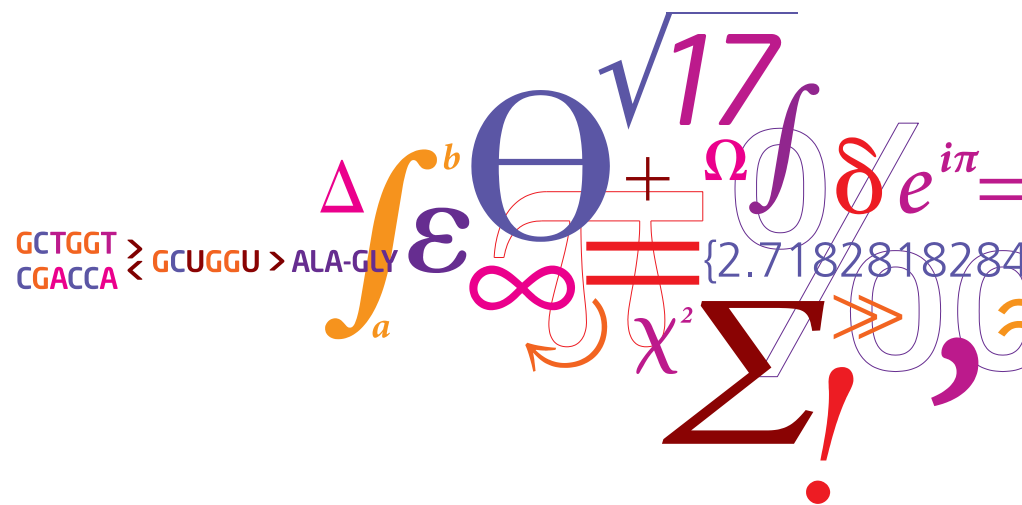


A quick look inside neural networks with Tensorflow.

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Neural networks

Neural
networks
can be a
black box

How can we illuminate them a bit?

Neural networks

Let's visualize how a neural network works.

$$y(x, w) = f\left(\sum_{i=1}^d w_i x_i + b_i\right)$$

The diagram shows the equation $y(x, w) = f\left(\sum_{i=1}^d w_i x_i + b_i\right)$ with three components highlighted by red circles and labeled with arrows: the activation function f is labeled "Activation function", the weight w_i is labeled "Weight", and the bias b_i is labeled "Bias".

Tensorflow playground

- Interactive tool to understand and experiment with simple examples.

<http://playground.tensorflow.org>

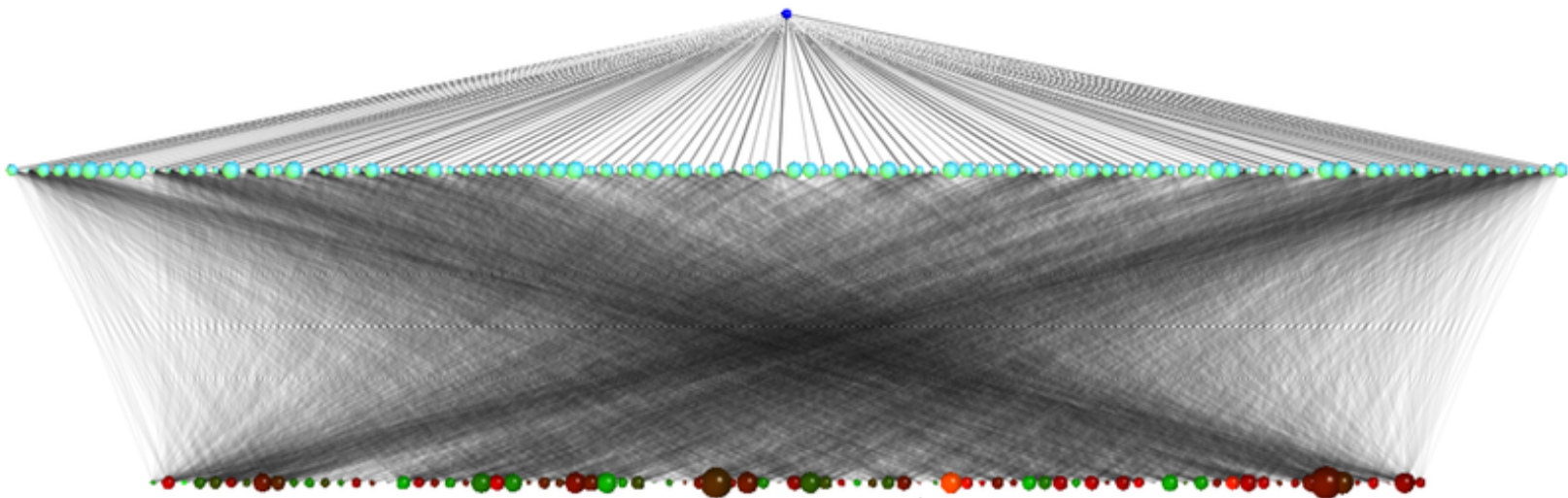
Visualizing complex problems

Can we visualize neural networks with multiple layers and hundreds of hidden units?

YES

Does it make sense?

Visualizing complex problems



Probably not...

Visualizing complex problems

What will be the best solution then?

- Summary visualizations
- Dimensionality reduction

How do we achieve this?

- **Tensorboard**



Tensorboard

- Purpose: make easier to understand, debug and optimize neural networks

- Visualizations:
 - Performance metrics: loss, accuracy...
 - Graph representation
 - Histograms and distributions of weights, activations, biases...
 - Projections

Tensorboard

Lets take a look!

Jupyter notebook online:

- https://drive.google.com/file/d/191S18cfE1gZx_FIM3FHVSqvvggXU8jen9/view?usp=sharing (only works with Chrome)

THANK YOU FOR LISTENING!