

Deep Learning in R Using Keras

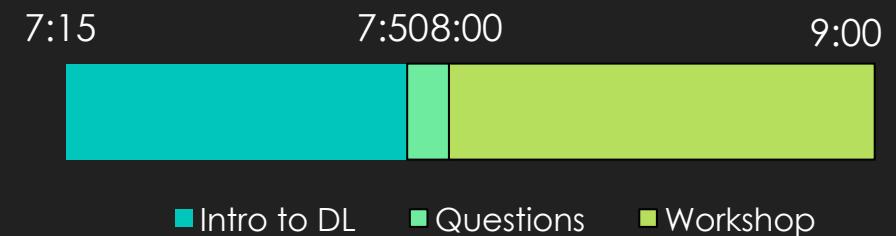
Anjali Karimpil @ R-Ladies Meetup

Introduction

Anjali Karimpil

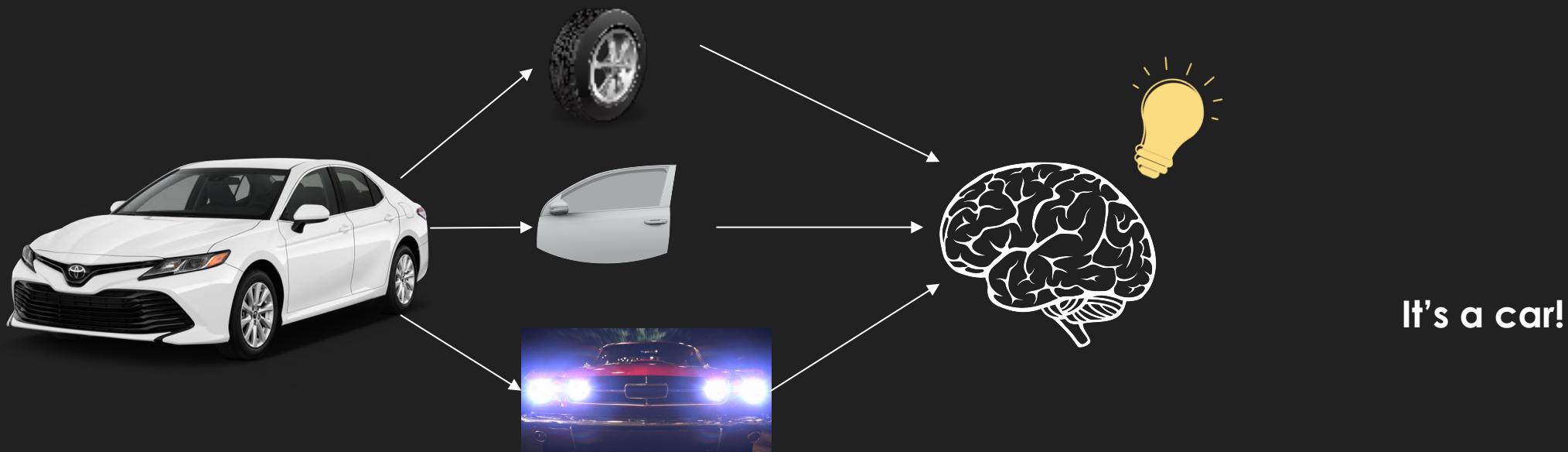


How we are going to roll today:

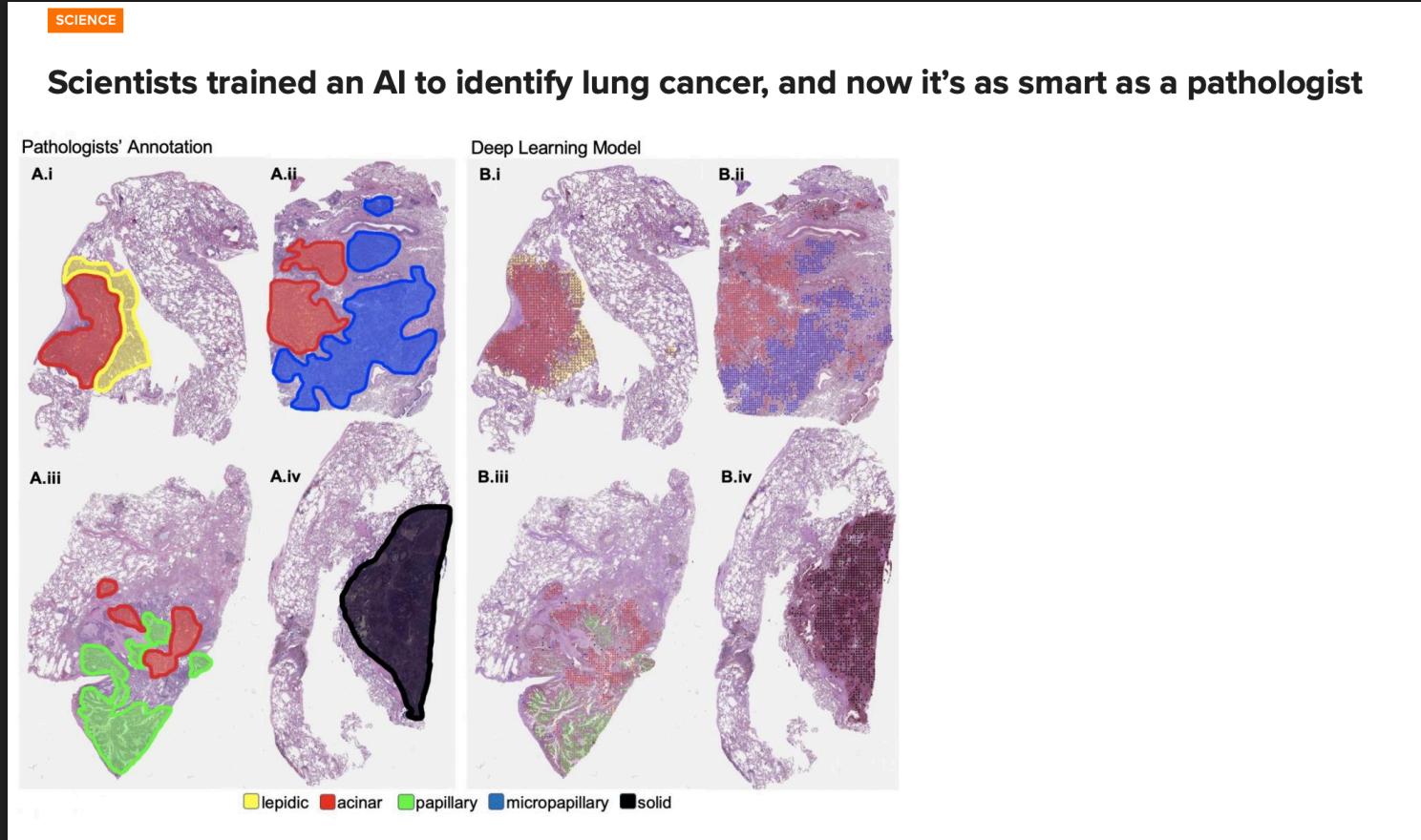


What is Deep Learning?

- Deep Learning is a sub-domain of Machine Learning.



Motivation

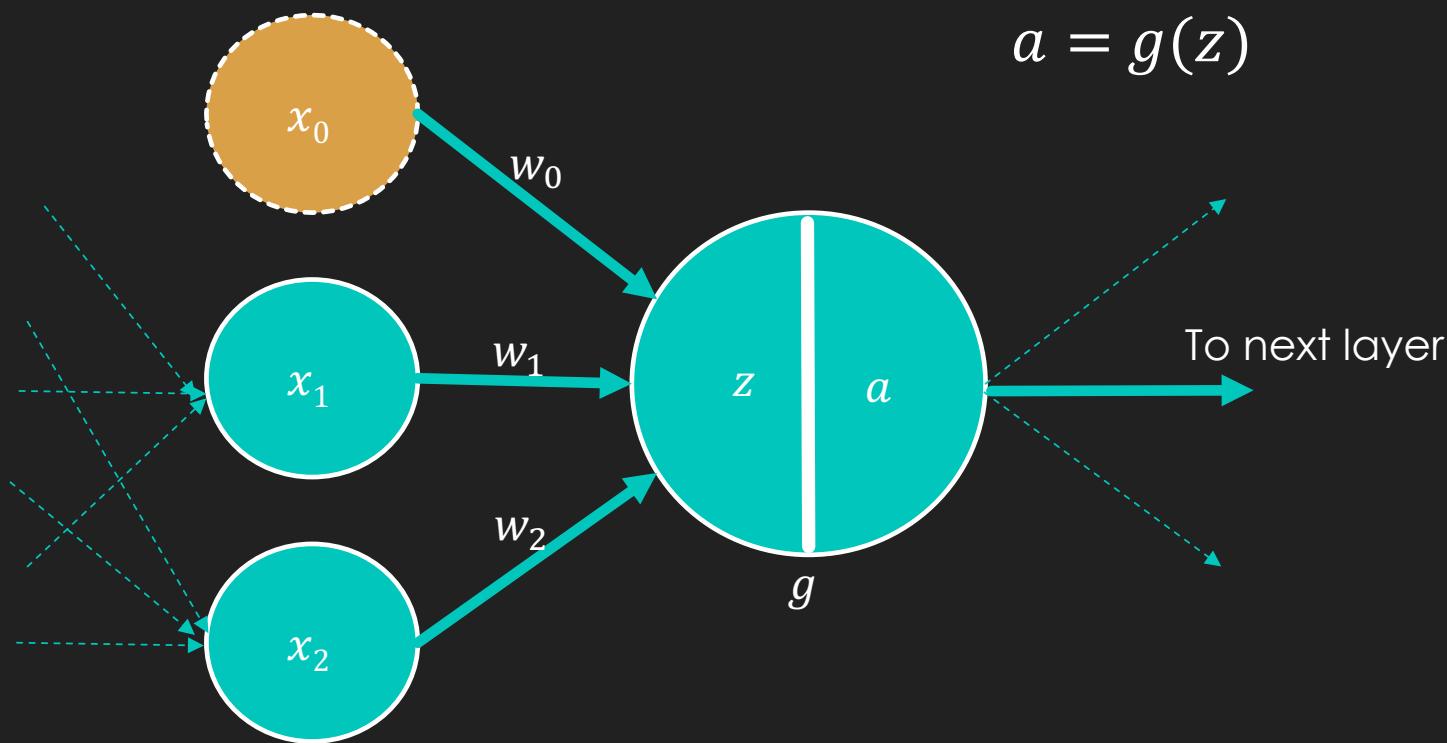


Why the buzz?

- DL is not new.
- LeCunn's handwriting recognition NN was run nearly 30 years ago.
- Recent surge in popularity due to hardware enhancements

It's not all magic!

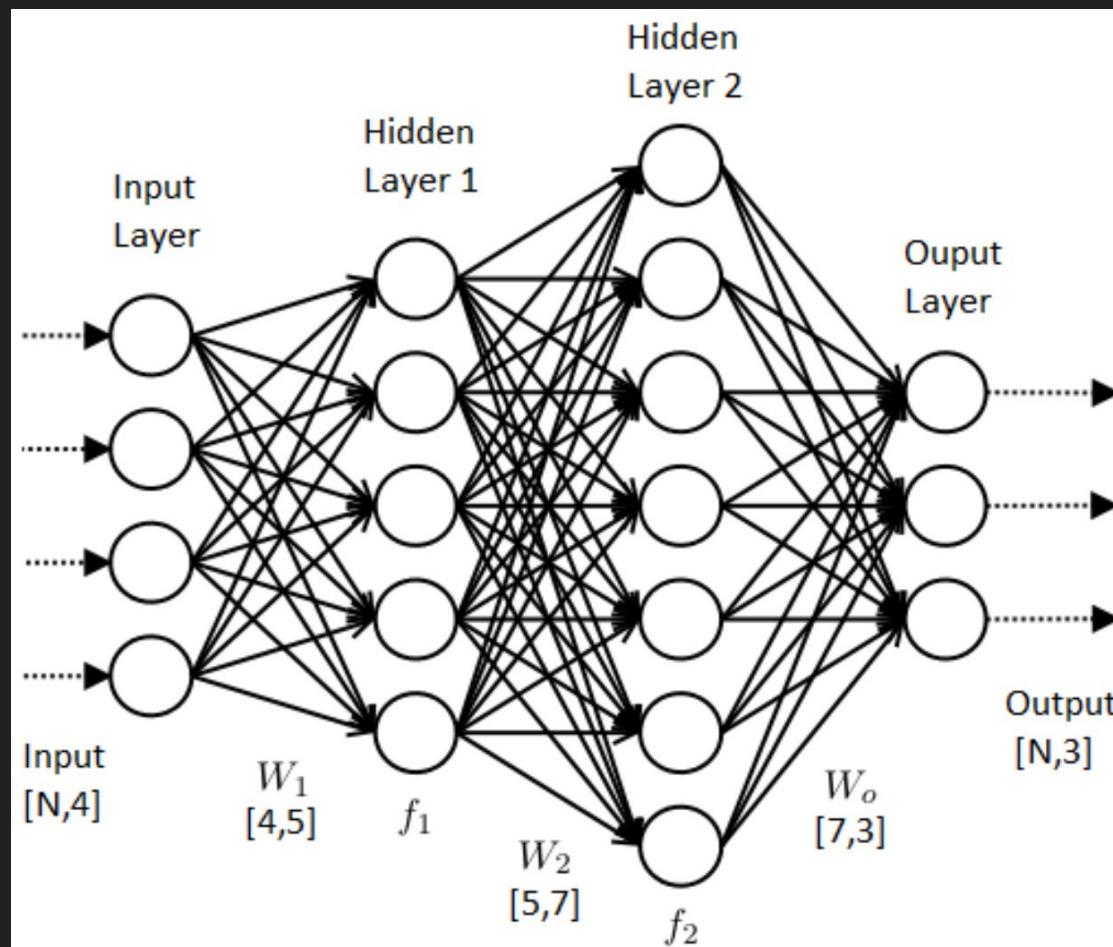
From previous layer



$$z = w_0 x_0 + w_1 x_1 + w_2 x_2$$
$$a = g(z)$$

Write something here that says on the line of Activation functions are what makes the neuron different from linear regression

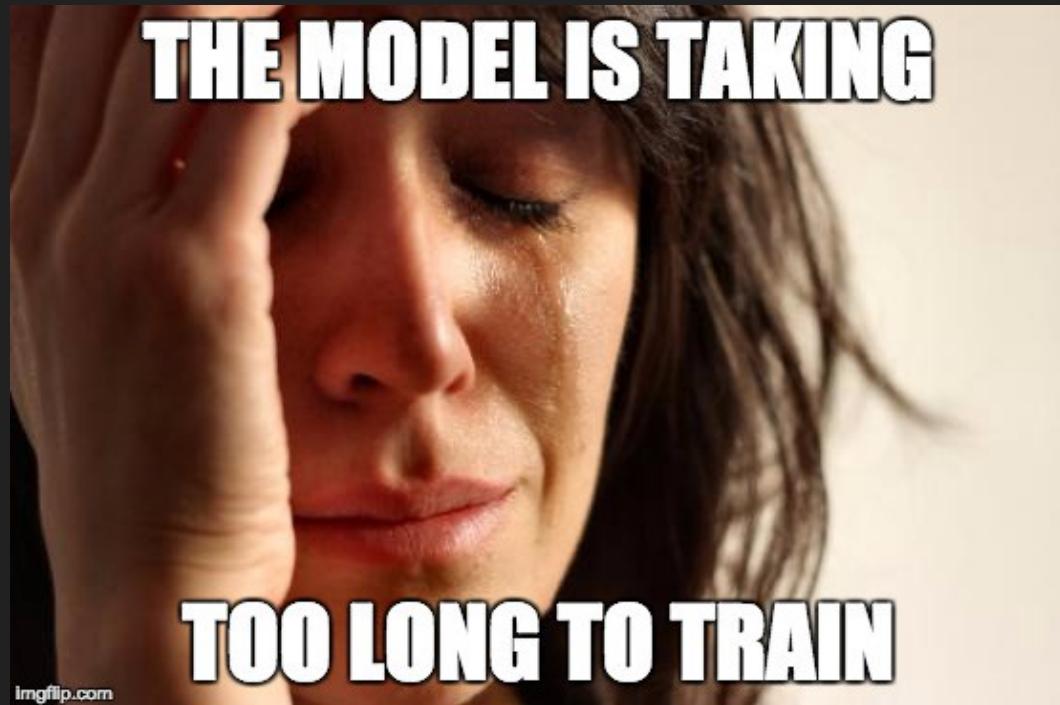
It's not all magic!



Challenges

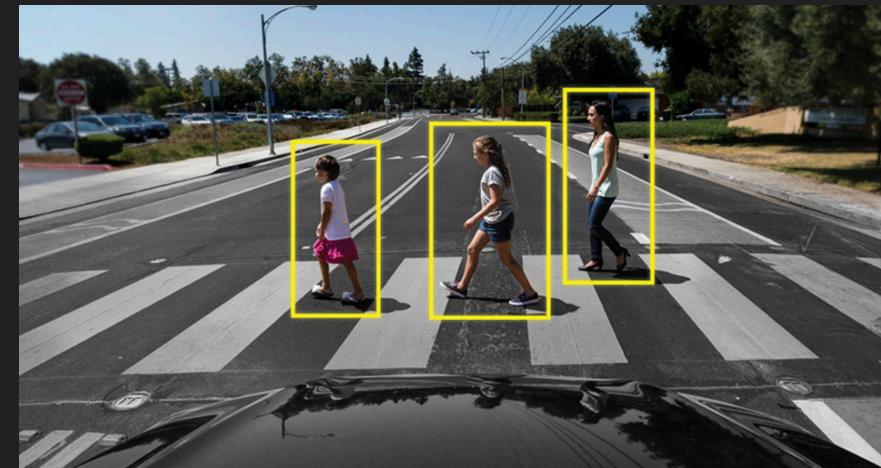
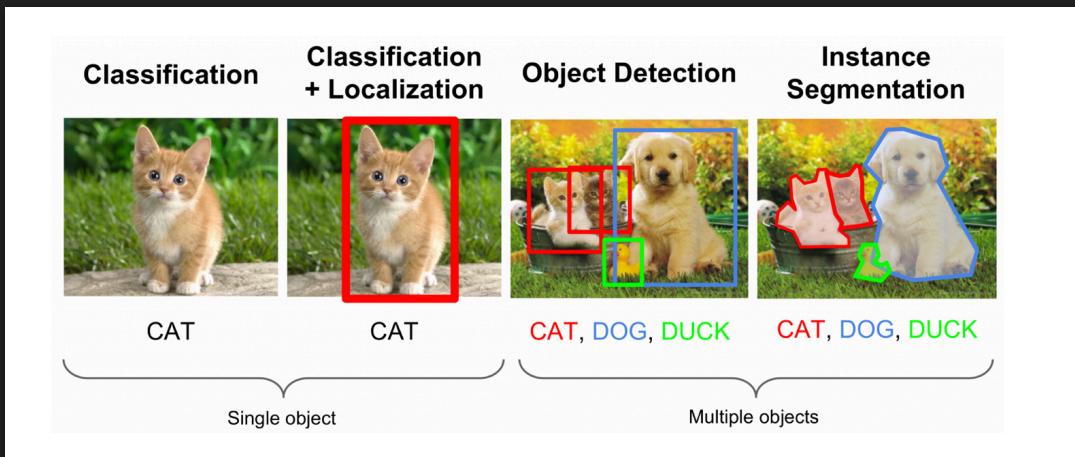
- Lack of clear explainability
- Need lotsa' data
- Need lotsa' dimensions in data
- Inherent bias in data

ALSO:



imgflip.com

But.. Applications Galore!



But again... Beware!



Is that all? Not really!

- Different architectures
- Hyperparameter Tuning
- NNs for grid-like data – CNN
- NNs for sequence data – RNN
- Parameter initialisation
- Regularisation techniques to combat overfitting
- Different frameworks – PyTorch, TensorFlow, Kaffe

I think I like this – where do I go next?

- 3Blue1Brown Youtube series – nice visualisation of backpropagation and an overview
- Deep Learning Book by Ian Goodfellow et al. (**Free & also the Bible of DL**)
- Deep Learning in R by JJ Allaire, Francois Chollet et al.
- Deeplearning.ai courses
- Fast.ai Deep Learning course
- Paperswithcode.com & arxiv.org for reading about new and upcoming research
- <http://www.arxiv-sanity.com>
- CS231N for Computer Vision
- CS224D for NLP