deeplearning.ai

Learning from multiple tasks

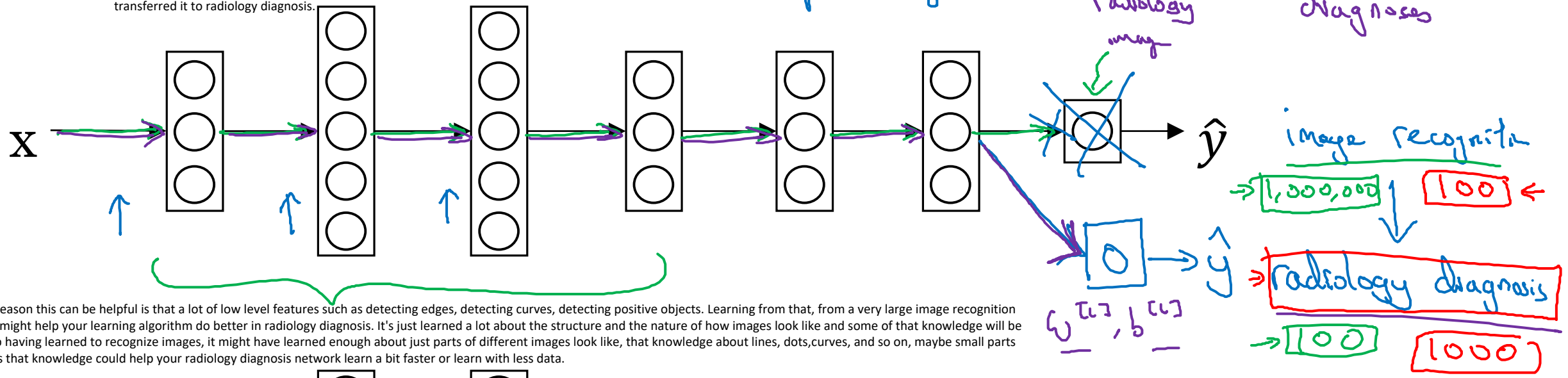
Transfer learning

One of the most powerful ideas in deep learning is that sometimes you can take knowledge. The neural network has learned from one task and apply that knowledge to a separate task.

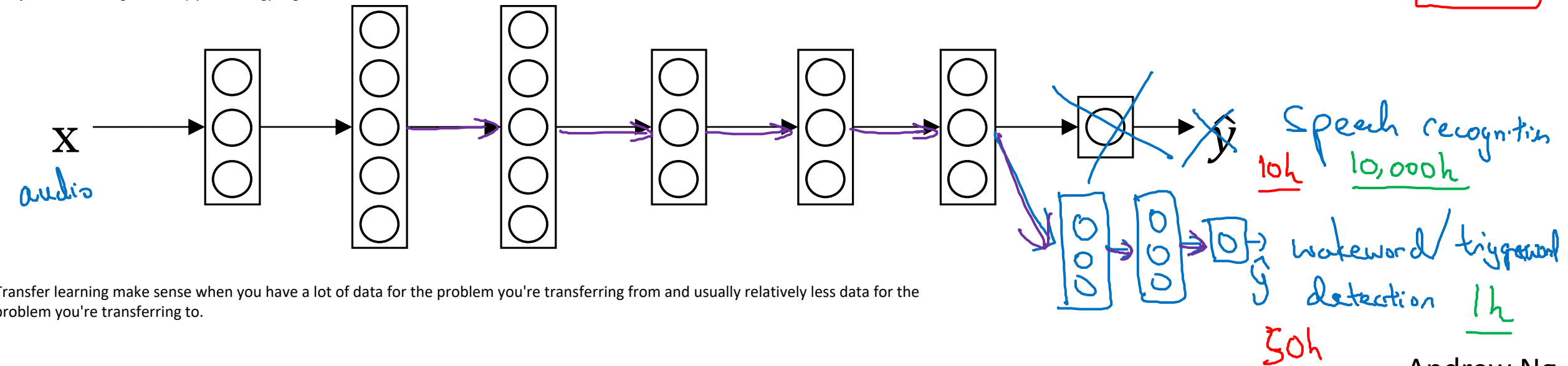
Transfer learning

adapt or transfer

pre-training and fine tuning weights in a transfer learning source. And what you have done in this example is you've taken knowledge learned from image recognition and applied it or transferred it to radiology diagnosis.



And the reason this can be helpful is that a lot of low level features such as detecting edges, detecting curves, detecting positive objects. Learning from that, from a very large image recognition data set, might help your learning algorithm do better in radiology diagnosis. It's just learned a lot about the structure and the nature of how images look like and some of that knowledge will be useful. So having learned to recognize images, it might have learned enough about just parts of different images look like, that knowledge about lines, dots,curves, and so on, maybe small parts of objects that knowledge could help your radiology diagnosis network learn a bit faster or learn with less data.



Transfer learning make sense when you have a lot of data for the problem you're transferring from and usually relatively less data for the problem you're transferring to.

Andrew Ng

When transfer learning makes sense

Transfer from A → B

- Task A and B have the same input x.
- You have a lot more data for Task A than Task B.

All of this is under assumption that what you really want to do well on is Task B. And because data for Task B is more valuable for Task B, usually you just need a lot more data for Task A because you know each example from Task A is just less valuable for Task B than each example for Task B.

- Low level features from A could be helpful for learning B.