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# Transfer Learning

CSCI316: Big Data Mining Techniques and Implementation



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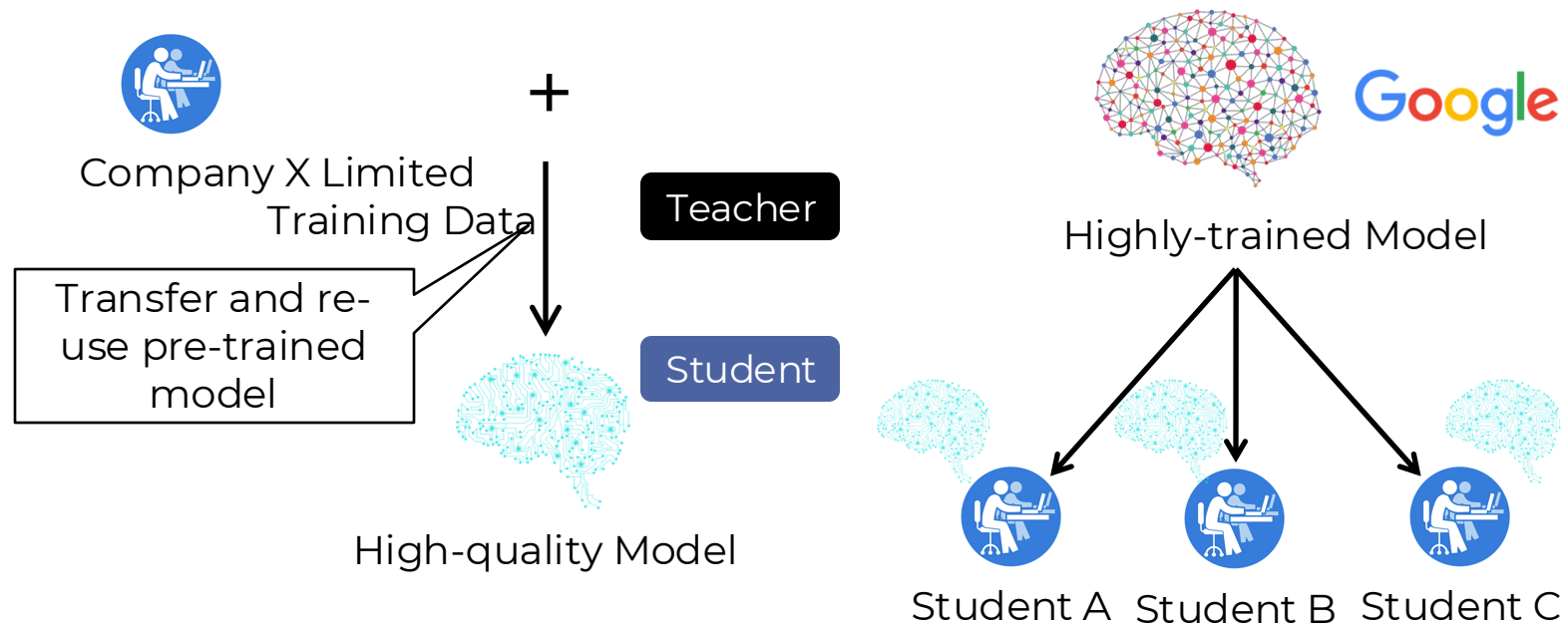
# Deep Learning is Data Hungry



Where do small companies get such large datasets?

- High-quality models are trained using large labeled datasets
  - Vision domain: *ImageNet* contains over 14 million labeled images

# A Prevailing Solution: Transfer Learning



Recommended by *Google, Microsoft, and Facebook*  
DL frameworks

# Deep Learning 101

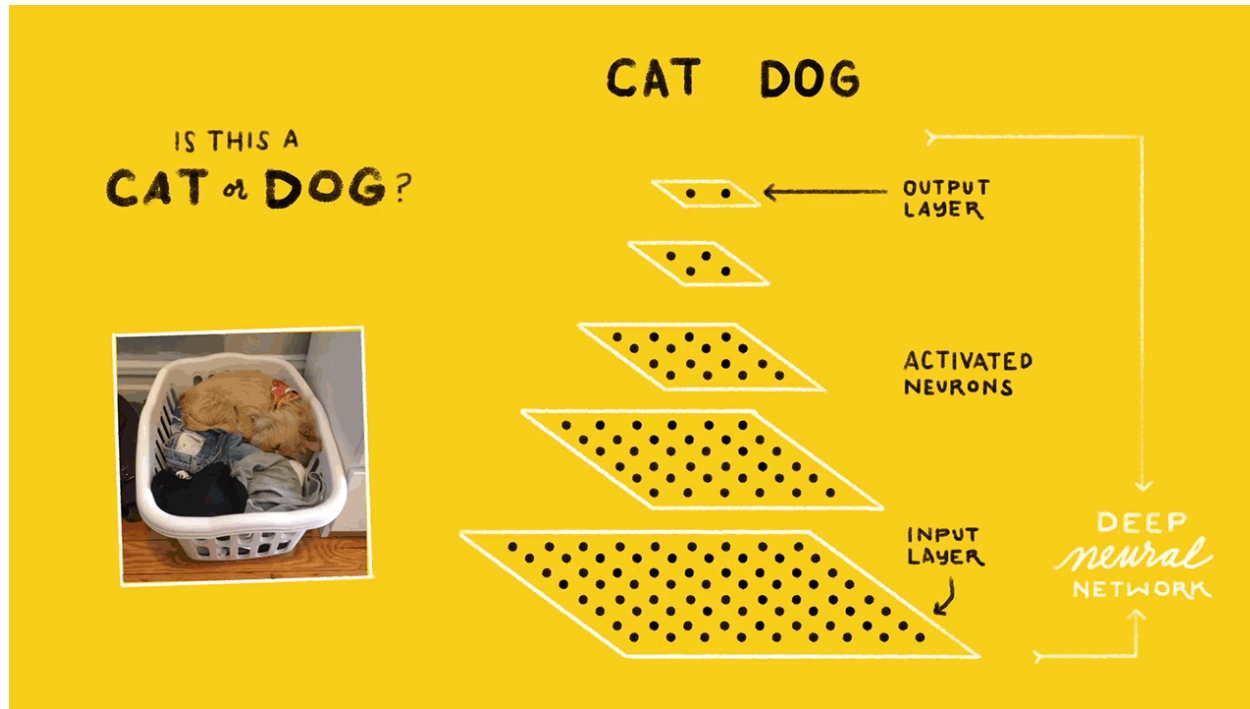
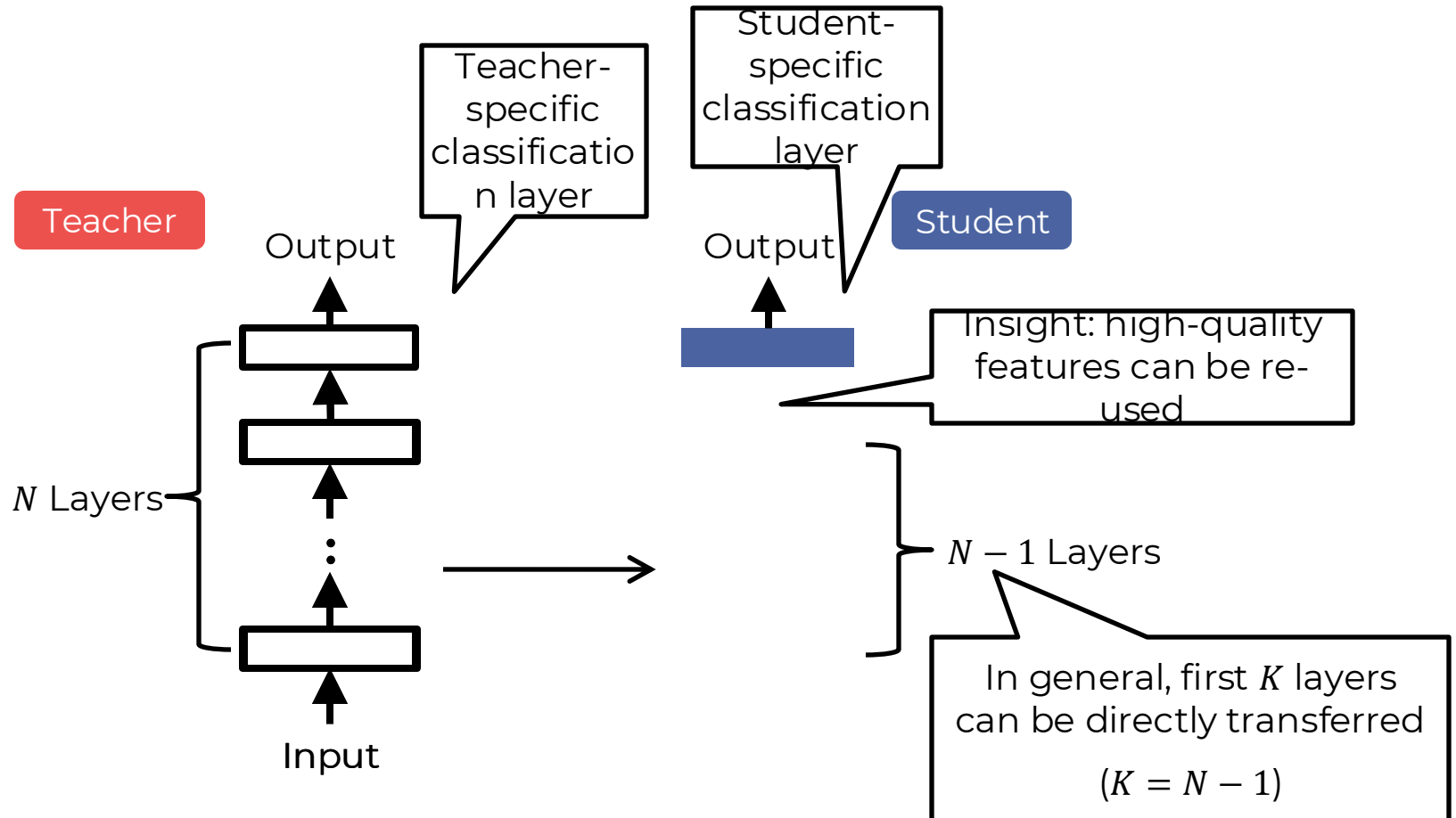


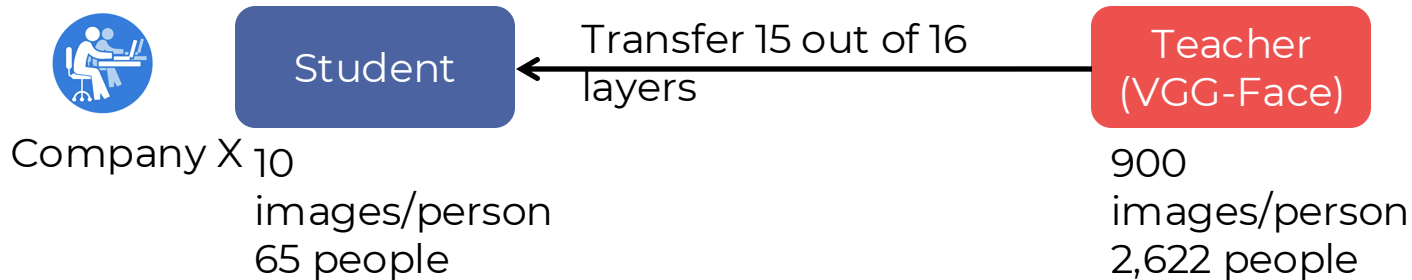
Photo credit: *Google*

# Transfer Learning: Details



# Transfer Learning: An Example

- Face recognition: recognize faces of 65 people



Classification Accuracy	
Without Transfer Learning	With Transfer Learning
1%	93.47%

# Spark and TensorFlow

- Spark excels at large-scale data processing
- Tensorflow is a leading deep learning library
- Can we combine the power of the two?
- A transfer learning pipeline implemented Spark and TensorFlow (see the supplementary materials)