TRANSFER LEARNING

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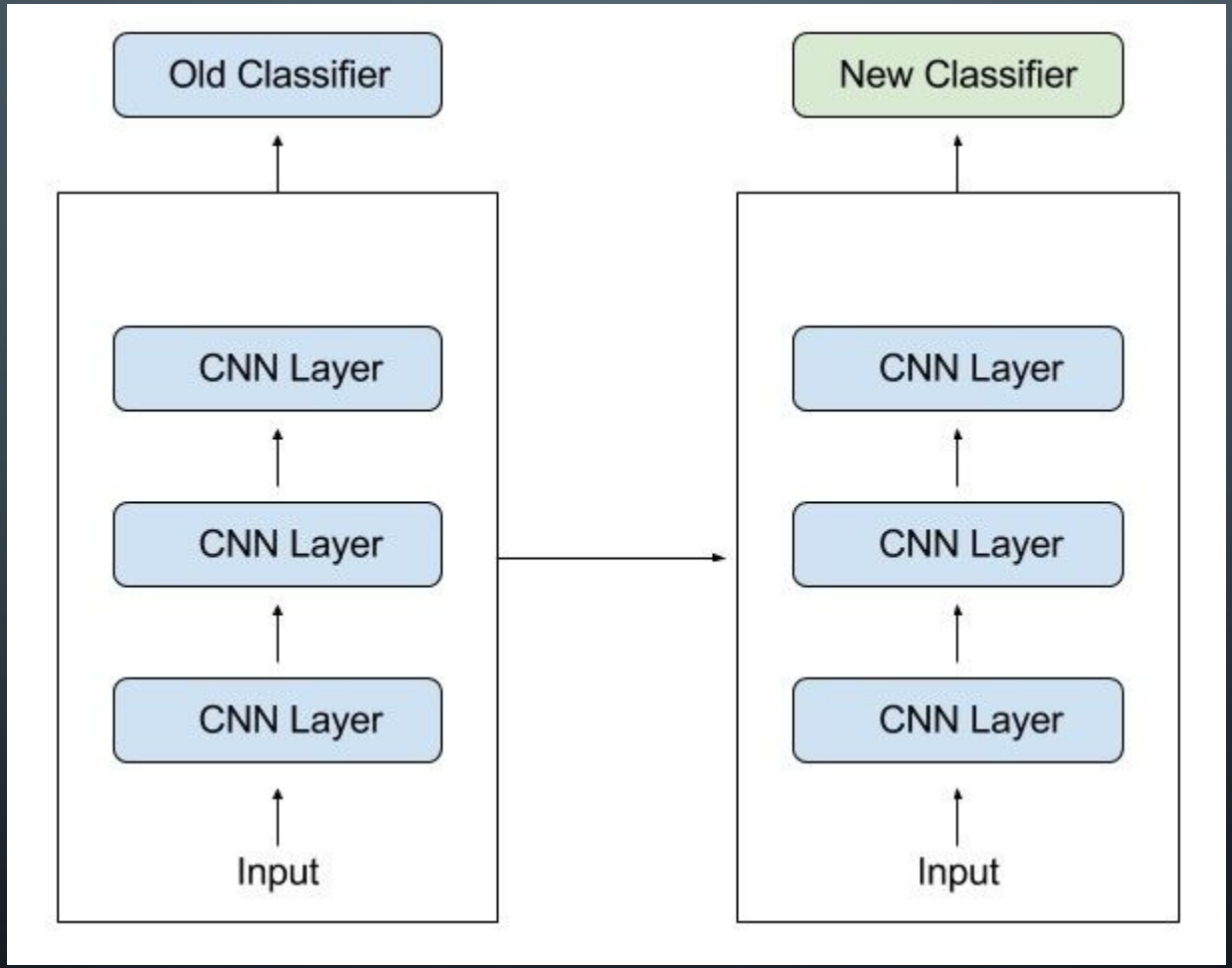
WHAT IS TRANSFER LEARNING

- We train a model on one task
- Use trained model on another task
- Increase final accuracy
- Decrease train time
- Decrease needed data size

TRANSFER LEARNING

- We use a pre-trained model (like VGG) on our task
- We use both weights and structure
- We have to train classifier
- We may or may not train CNN layers

TRANSFER LEARNING



EXAMPLE – OCR

EXAMPLE – SELF-DRIVING CARS

BENEFITS OF TRANSFER LEARNING

- Saving training time
- Better performance
- Dose not need a lot of data
- Artificial General Intelligence

WHEN WE USE TRANSFER LEARNING

- Not enough data
- pre-trained model on similar task (trained with massive data) exists
- Tasks have same input

- Note: features have to be general

APPROACHES TO TRANSFER LEARNING

- Training model and then reuse it
- Using a pre-trained model

APPROACHES TO TRANSFER LEARNING

- Use pre-trained model to extract features then train classifier
  - representation learning
- Build a new model by combining pre-trained model and classifier
  - train classifier
- Build a new model by combining pre-trained model and classifier and
  - train classifier first
  - Train classifier and pre-trained model together
- Just use first CNN layers as starting point of model