Diabetic Retinopathy Detectation

Team 2:

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Table of Contents

Online Data Augmentation

Principle

Dataset

- tf.data.Dataset.map (**parse_function**, parameter)
- tf.data.Dataset.prefetch()

Endless long dataset at training

- tf.data.Dataset.repeat(-1)
- tf.data.Dataset.take(-1)

parse_function()

◎ (file, label) → (image, label)

◎ a = random.randint(1,10)

- tfa.image.rotate()
- tf.image.random_flip_up_down()
- tf.random_flip_left_right()

Online Data Augmentation

Problem

Training accuracy stays low

Solutions

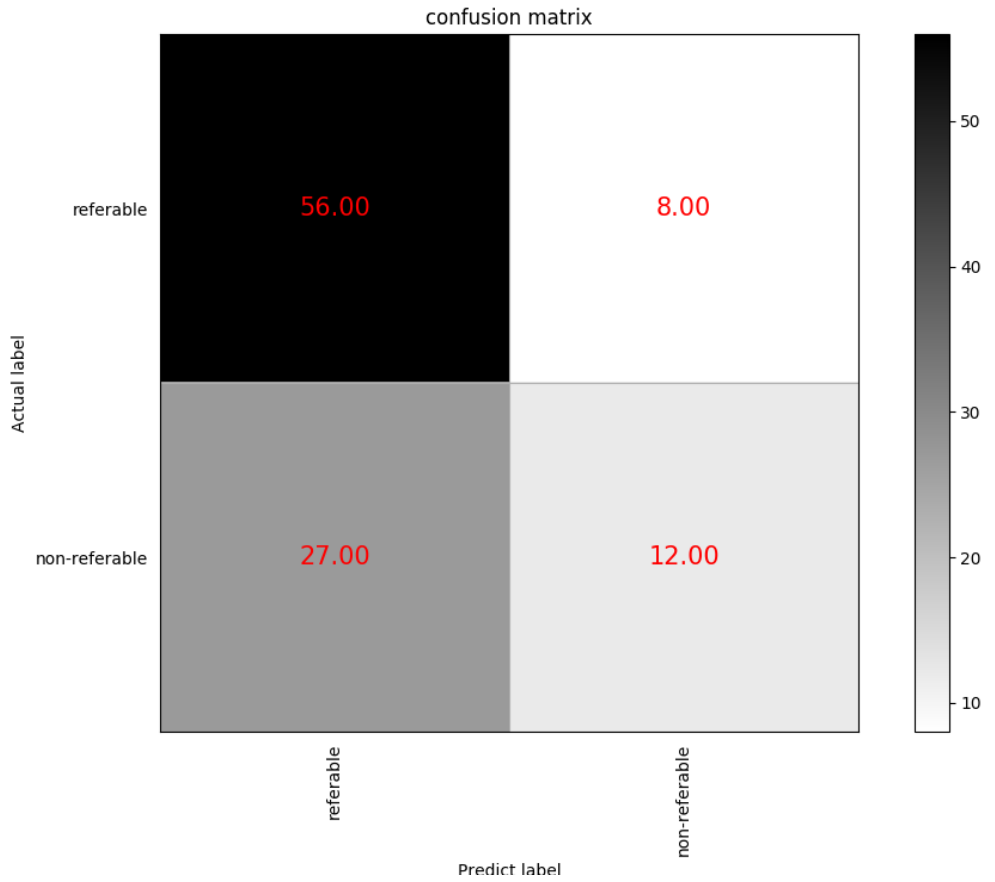
- Appropriate ratio
- Flipping, rotating, cropping...

Too different images ?

Small ratio between original images and augmented images ?

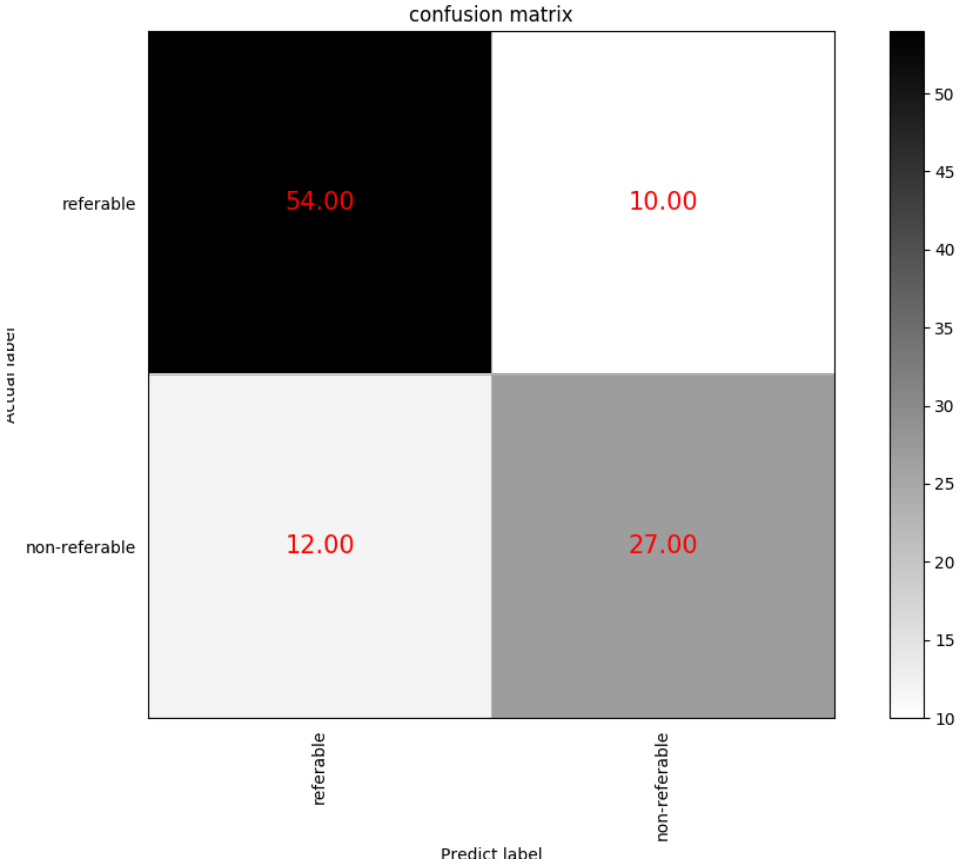
Online Data Augmentation

Without data augmentation



Test acc.:0.67

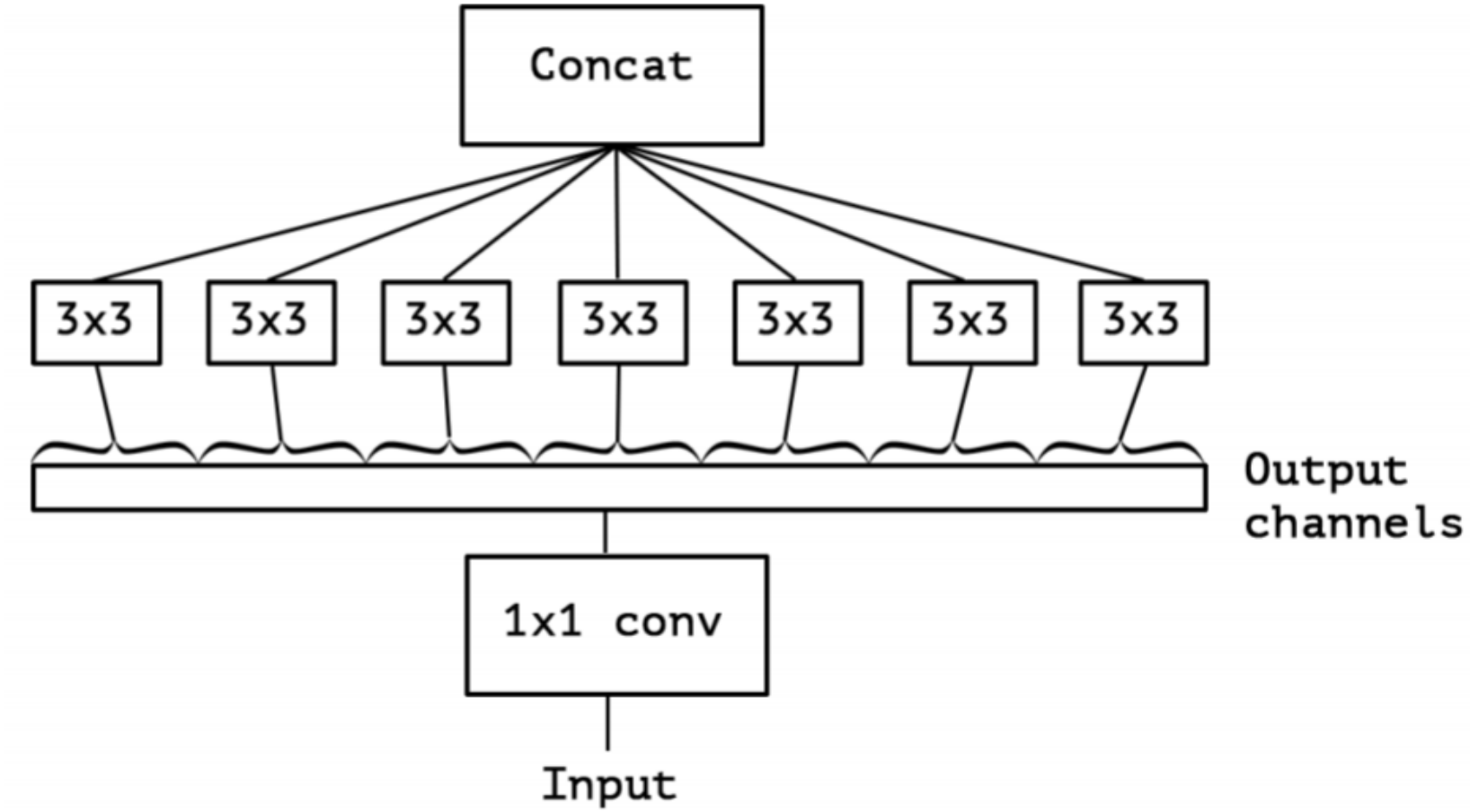
With augmentation



Test acc.:0.786

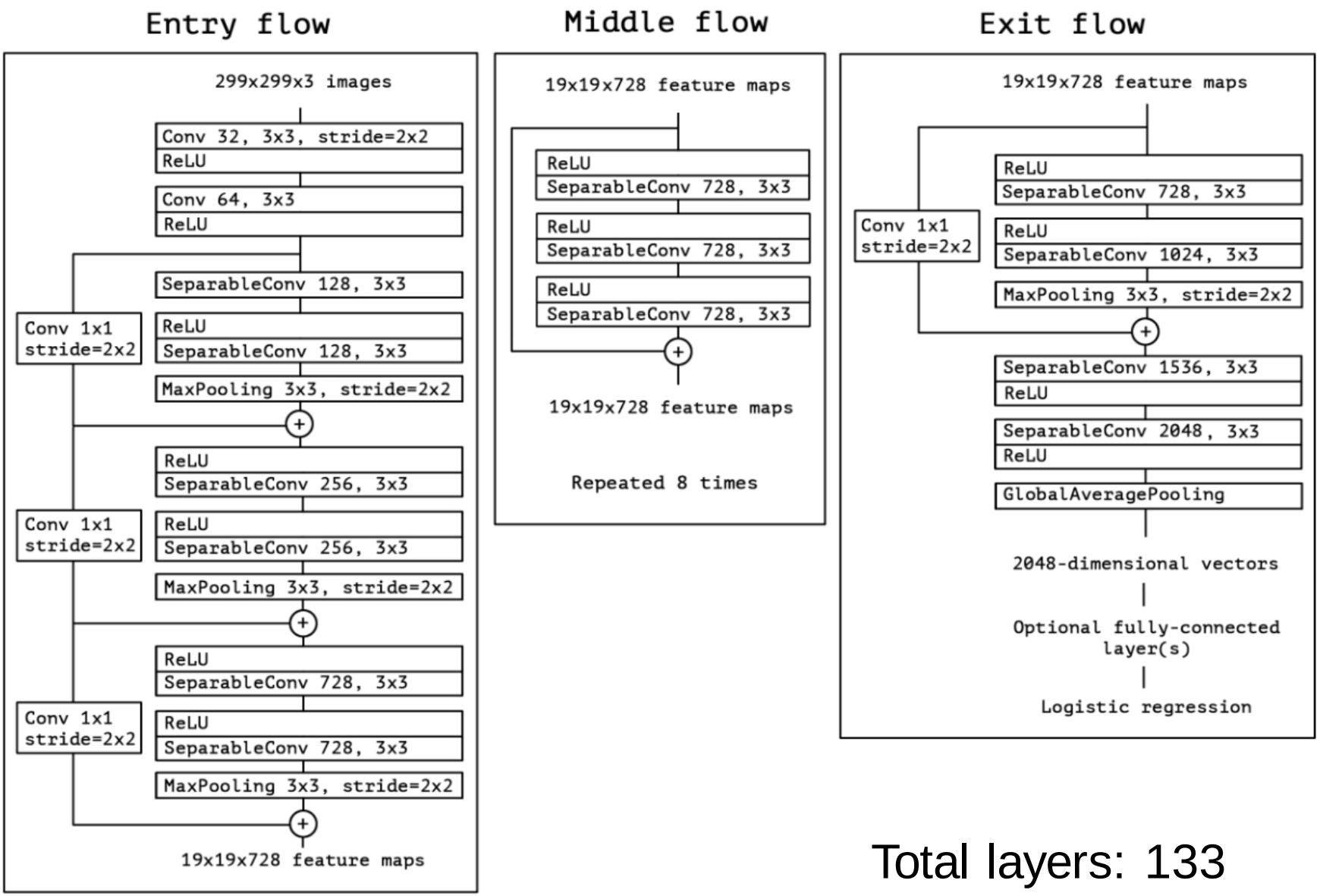
Transfer Learning

Base model: Xception ------ an extreme version of Inception with one spatial convolution per output channel of the 1x1 convolution.



- Depthwise separable convolution

Xception architecture



Total layers: 133

Transfer Learning - Model

- Base model: Xception, excluding the last optional fully connected layer
- Add 2 dense layers

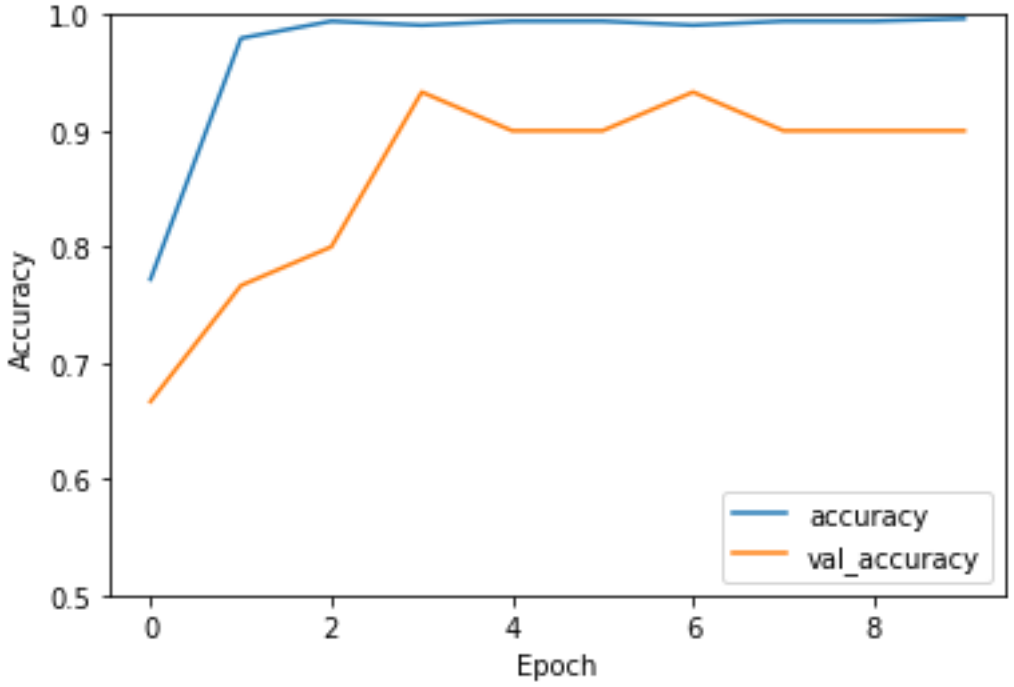
Model: "sequential"

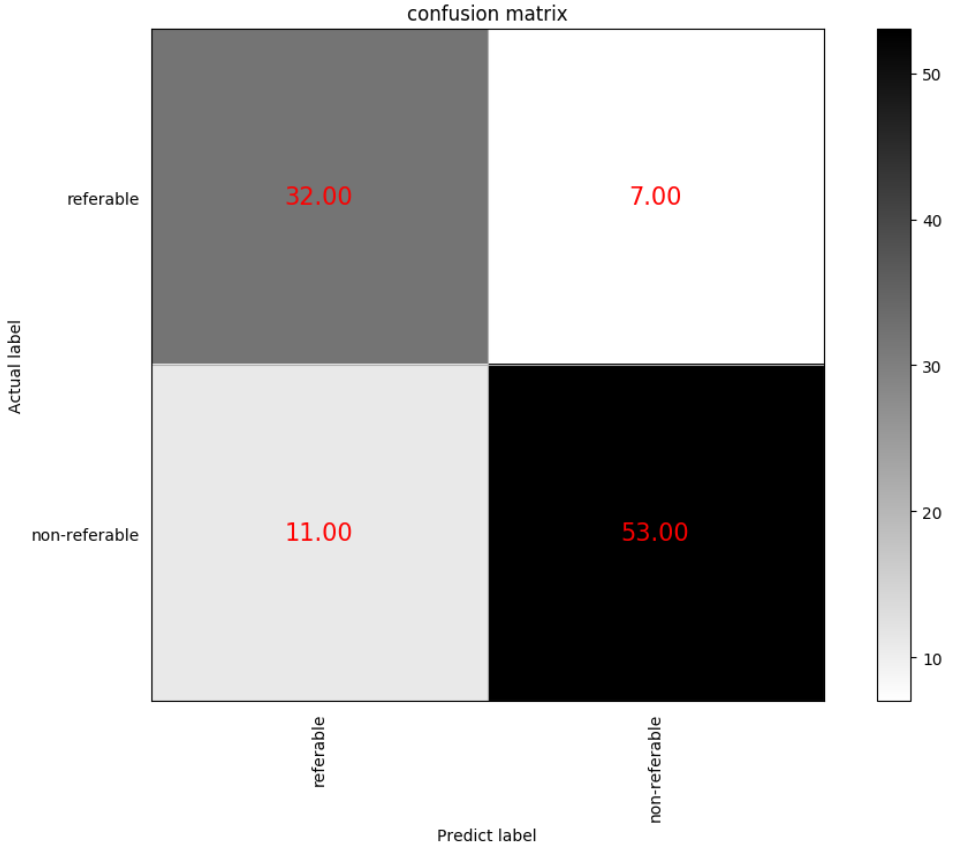
Layer (type)	Output Shape	Param #
xception (Model)	(None, 2048)	20861480
dense (Dense)	(None, 512)	1049088
dense_1 (Dense)	(None, 1)	513

- Finetune layers: last 33 layers
- First 100 layers: non trainable

Transfer Learning - Performance

Training and validation accuracy





Test accuracy: 0.8252427