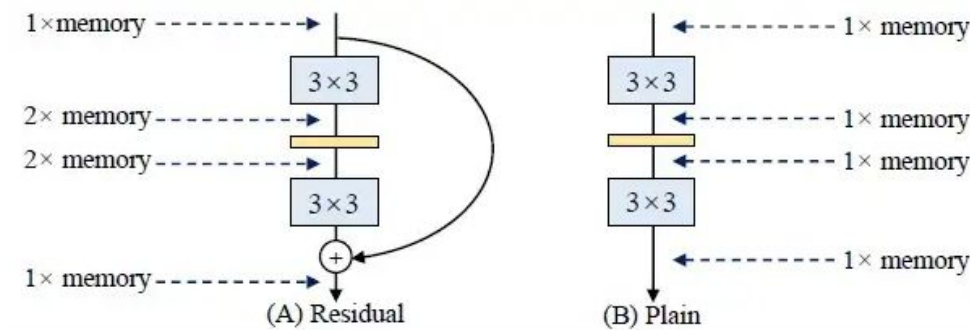# RepVGG

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Outline

Abstract

- Simple but powerful architecture of convolutional neural network, which has a VGG-like inference-time body

- A stack of 3x3 convolution and ReLU, while the training-time model has a multi-branch topology like ResNet

- Decoupling of the training-time and inference-time architecture is realized by a structural **re-parameterization** technique

- On NVIDIA 1080Ti GPU, RepVGG models run 83% faster than ResNet-50 or 101% faster than ResNet-101

- Shows favorable accuracy-speed trade-off compared to the state-of-the-art models like EfficientNet and RegNe
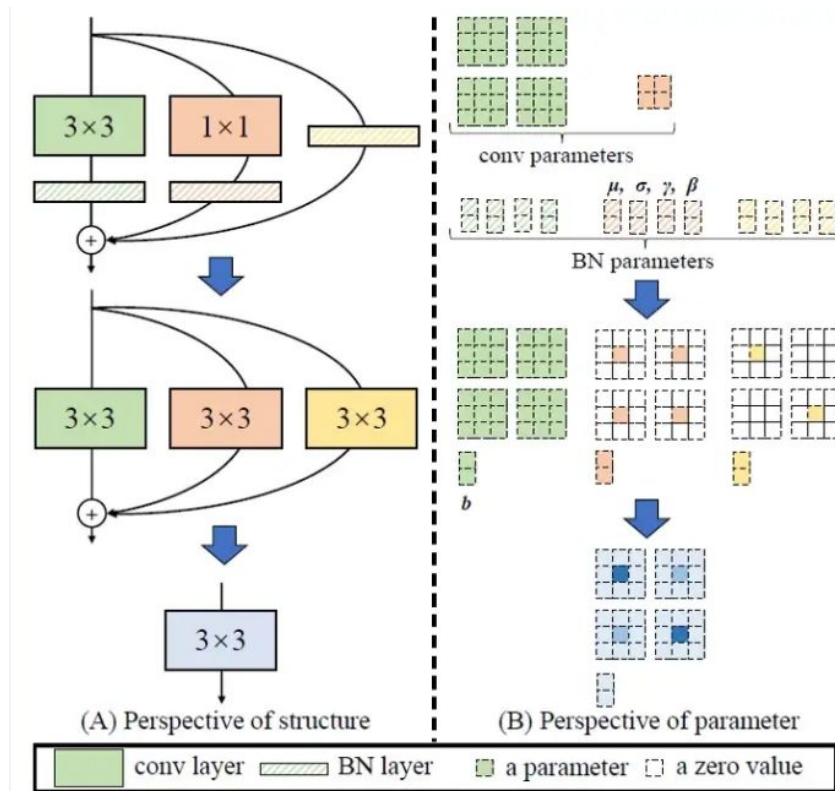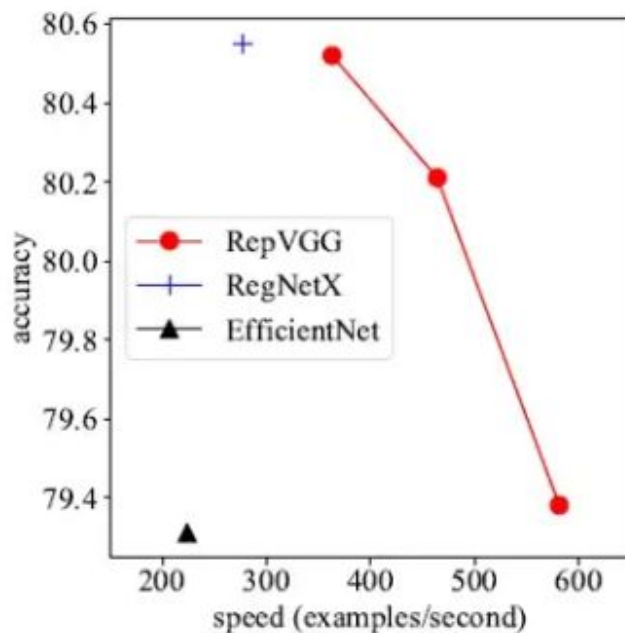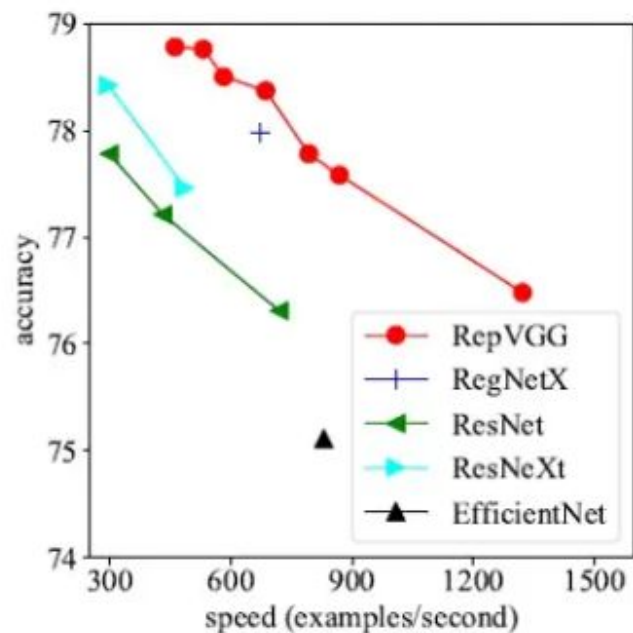
Problems of Multi-Branch Models

1. Speed
2. Memory
   a. Multi-branch topology is memory-inefficient
   b. Results of every branch need to be kept until the addition or concatenation

Model Overview

(A) Perspective of structure

(B) Perspective of parameter

conv parameters

BN parameters

$\mu, \ \sigma, \ \gamma, \ \beta$

b

conv layer   BN layer   a parameter   a zero value

Comparison

Improvement

1. Using different kernel sizes
2. Using drop out
3. Adding more layers

Thanks For Your Attention!