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| **Classification Algorithms** | **Pros** | **Cons** | **Structure of the algorithm** |
| RESNET | -can solve degradation network when network become deeper  - skip connection  - Bottleneck block: each residual function f 3 (1x1 and 3x3 and 1x1) layers are stacked 1 othe other. The 1x1 layer are responsible for reducing and then increasing the dimension, leaving by 3x3 layers a bottleneck with smaller input and output dimension.  - high accuracy | - have more layer so need more time | F(x)+x  use identity block and convolution block.  Resnet 50:  50-layer Conv:   * Conv1 * Maxpooling * Conv 2 à 5 with \* 3 skip connection layer (the 1rst use conv block but the others use identity) * Fully connected softmax |
| DENSNET | -connecting every layer directly with each other (uses feature as complexity)  - concatenate maps for each layer in the dense block  - reduce number of parameters | -Huge number of layers | Densnet 121 (number of layers in network):  -conv 7\*7  -pooling 3\*3  -4 dense block (inside conv 1\*1 + conv 3\*3 (have to run 6, 12, 24,16 convolutional layers)  Separated by - transition layer (conv 1\*1 layer + avg pool 2\*2) |
| VGG | * No need power computer or strong graphic card for example * High speed | * Huge numbers of parameter * Low rate of accuracy | 16 layer conv :   * conv 1\* 2 * Pooling * Conv 2\*2 * Pooling * Conv 3\* 3 * Pooling * Conv 4\* 3 * Pooling * Dense layer \*3 |
| INCEPTION | - image distortion,  - batch normalization: to improve speed, performance, and stability  - RMSProp (Gradient based optimization technique)  - bring parameters to 4 million (instead 60 million in AlexNet)  - deep network and had 22 layers  - V3 improvement: use factorisation (into smaller convolution), asymmetric  - give better accuracy with V3 | - use many small convolutional: so, there are many parameters | V3: have 48 layers in network.  - conv 3\*3 by 3times  - Max pooling  - conv 1\*1  - conv 3\*3  - Max pooling  - Inception:  -1\*1 convolution + 3x3 maxpooling  -3\*3 convolution + 2 layers of 3\*3 convolution + 1\*1 convolutions  - filter concatenation  - 2 dense layer |