

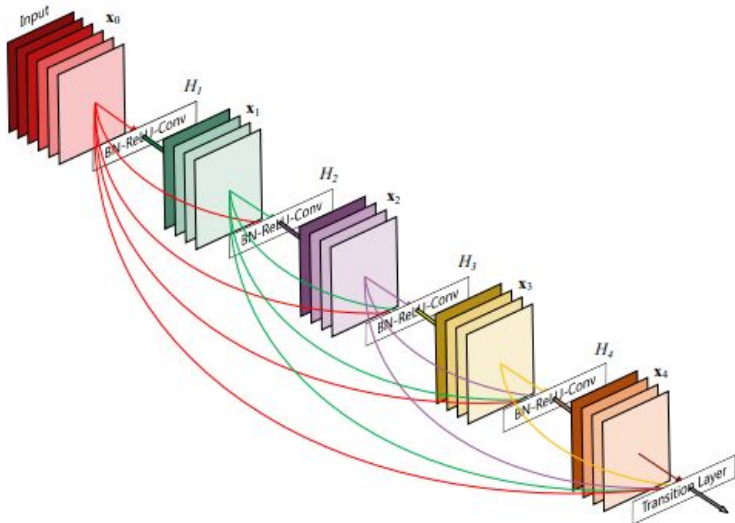
Densely Connected Convolutional Networks

CONs

By: Ankur Garg

Con 1: Claiming Deep Supervision

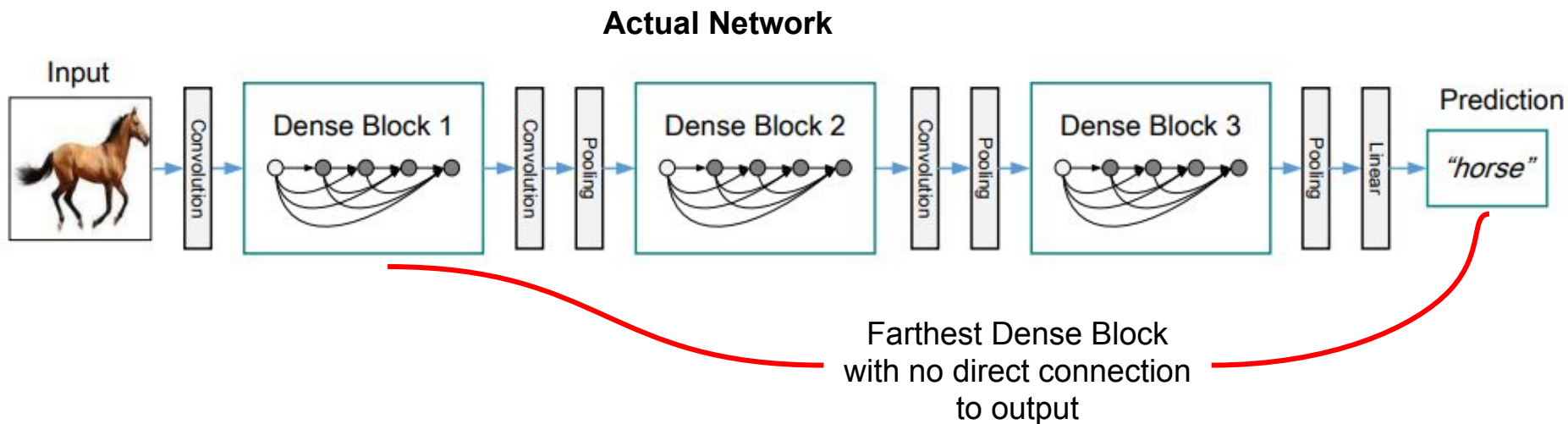
Claim: “Each layer has **direct access** to the **gradients from the loss function** and the original input signal, leading to an implicit deep supervision”



**Expected this to be the whole
Network architecture**

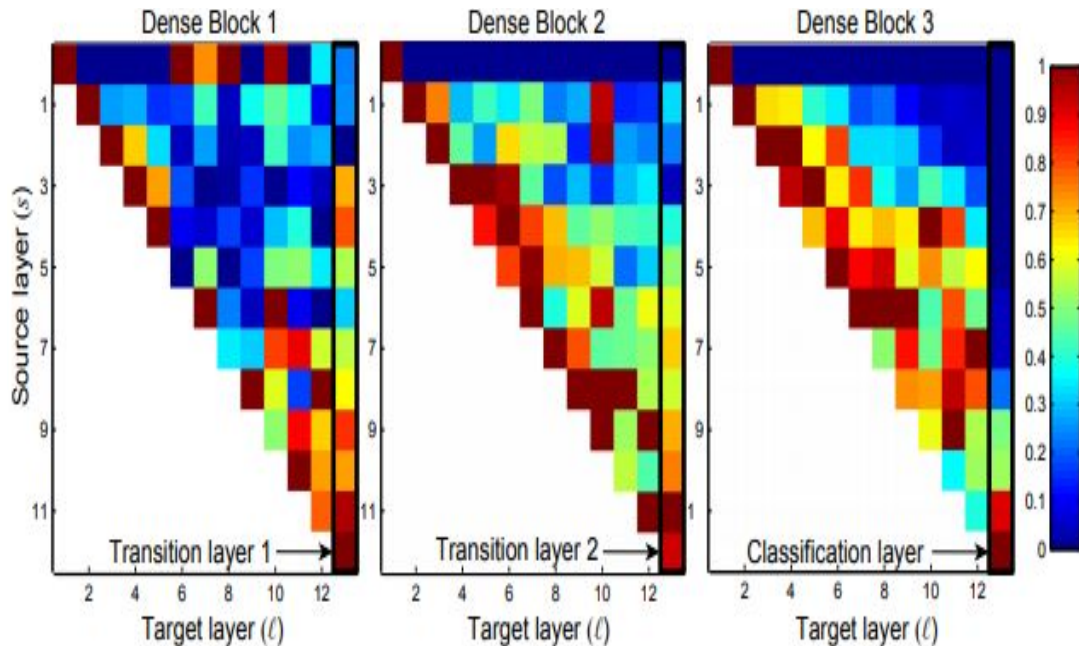
Con 1: Claiming Deep Supervision

Claim: “Each layer has **direct access** to the **gradients from the loss function** and the original input signal, leading to an implicit deep supervision”



Con 2: Weak Validation of Feature Reuse Claim

- Weights still decrease with distance from target layer
- Did they try dropping layers as mentioned for ResNet?



Con 2: Weak Validation of Feature Reuse Claim

- Do we need connections to all previous layers?

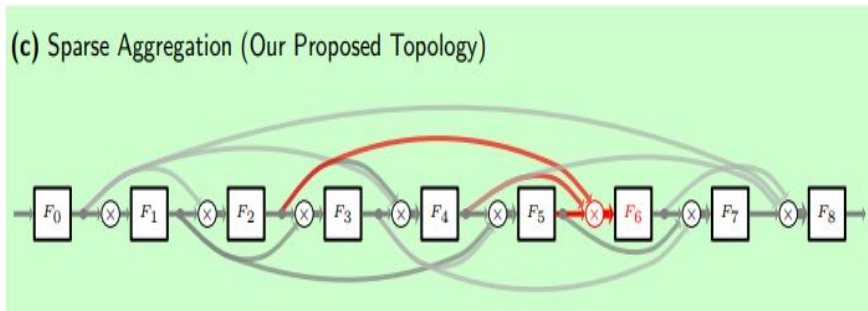


Image Source: Zhu, Ligeng, Ruizhi Deng, Michael Maire, Zhiwei Deng, Greg Mori, and Ping Tan. "**Sparsely Aggregated Convolutional Networks**." In *Proceedings of the European Conference on Computer Vision (ECCV)*, pp. 186-201. 2018.

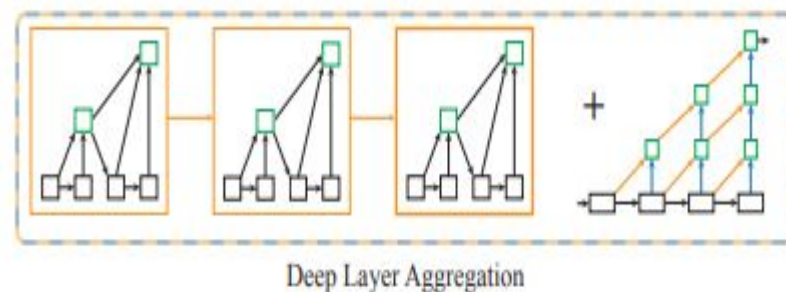



Image Source: Yu, F., Wang, D., & Darrell, T. (2017). **Deep Layer Aggregation**. *CoRR*, abs/1707.06484

Con 3: Intuition behind Model Architecture

- Ablation study for number of dense blocks?

Con 4: Generalizability to other Domains



The screenshot shows a GitHub issue page for 'DenseNet on Pascal VOC #47'. The issue is open and was created by 'blateyang' on April 27. A comment from 'blateyang' dated April 27 reads: 'Hi, I think DenseNet is a promising model and I try to take it as the backbone of Faster R-CNN in object detection. I chose DenseNet169 pretrained on ImageNet to replace the ResNet50 backbone of Faster R-CNN and used the same hyperparameters configuration as ResNet50 version of Faster R-CNN. However, the training result of DenseNet version is worse than ResNet50 version(roughly 3% lower on VOC2012 test). Can you help me analyse the reason or give me any advice? @liuzhuang13 Many thanks!'. There is one thumbs-up reaction to the comment.



The screenshot shows a comment by 'ahundt' from April 20, 2017. The comment text is: 'It seems the original authors explain in [SimJeg/FC-DenseNet#10](#) from their [FC-Densenet repository](#) that they have found DenseNetFCN performance isn't very good on Pascal VOC. @observer07 @titu1994 you will be interested in this info.' The comment has two thumbs-up reactions and one rocket emoji reaction.

1. <https://github.com/liuzhuang13/DenseNet/issues/47>
2. <https://github.com/keras-team/keras-contrib/issues/63>

Thank You