A Mixed Dense Convolutional Neural Network for Image Analysis

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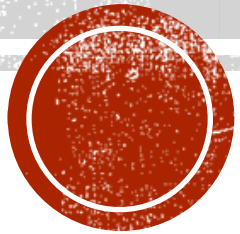

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Content

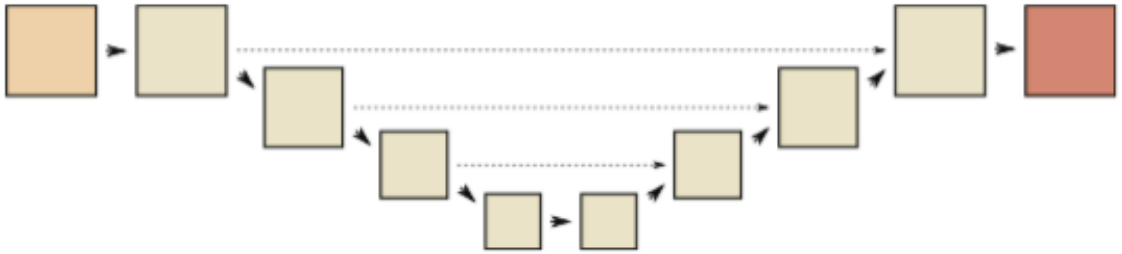
- 1. Theory & algorithms
- 2. Application

Theory & algorithms

- 1. Mixing scales
- 2. Dense connections
- 3. Mixed-Scale Dense neural networks

Mixing scales

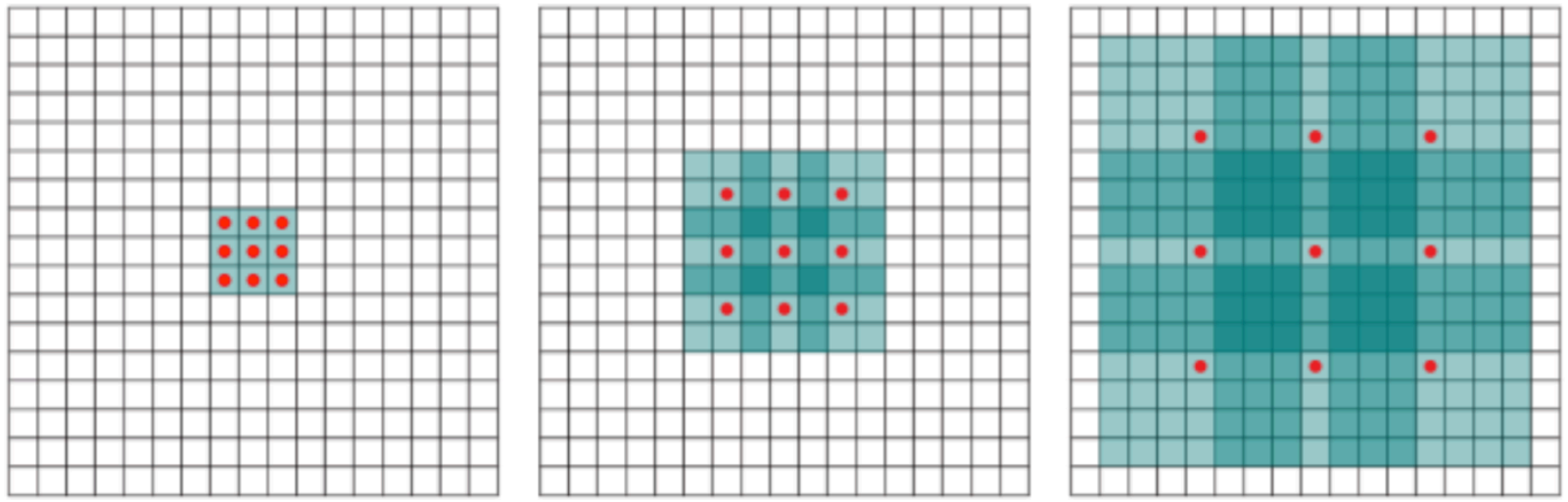
- **Dilated convolutions**（扩张卷积）



Downscaling and upscaling of common DCNN architecture

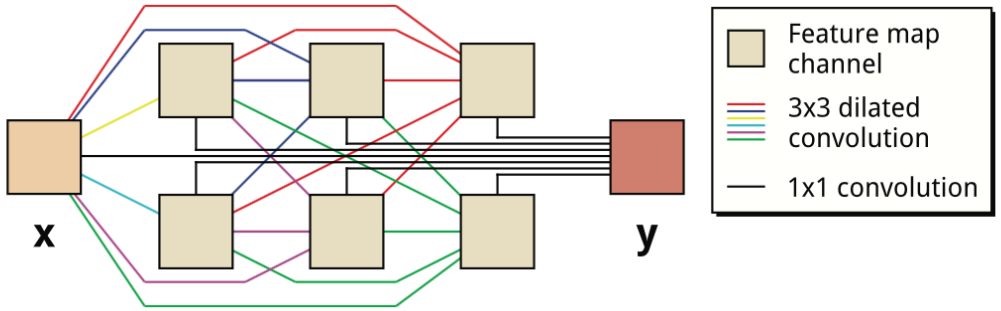
Mixing scales

- **Dilated convolutions**（扩张卷积）



Mixing scales

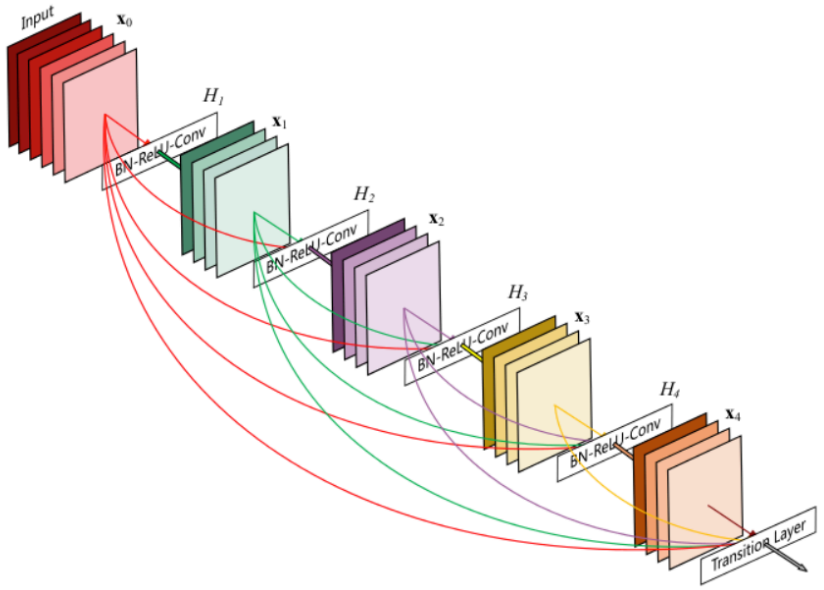
- Mixed Scale



1. A certain scale can directly inform decisions
2. Multi-scale early layers improve the results of deeper layers
3. Less parameters and easier to train
4. Making Mixed-Scale DCNNs applicable across different problems

Dense connections

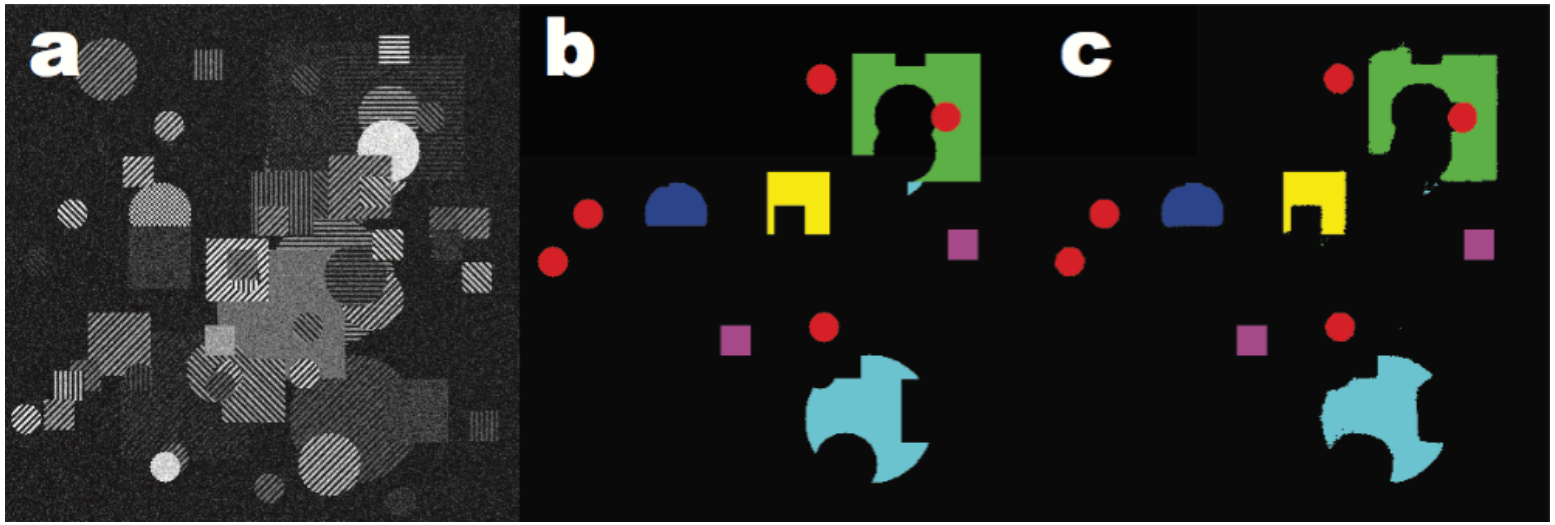
- Dense connection(稠密连接)



1. Reducing the risk of overfitting
2. Enabling effective training with relatively small training sets
3. A relatively small number of parameters

Application

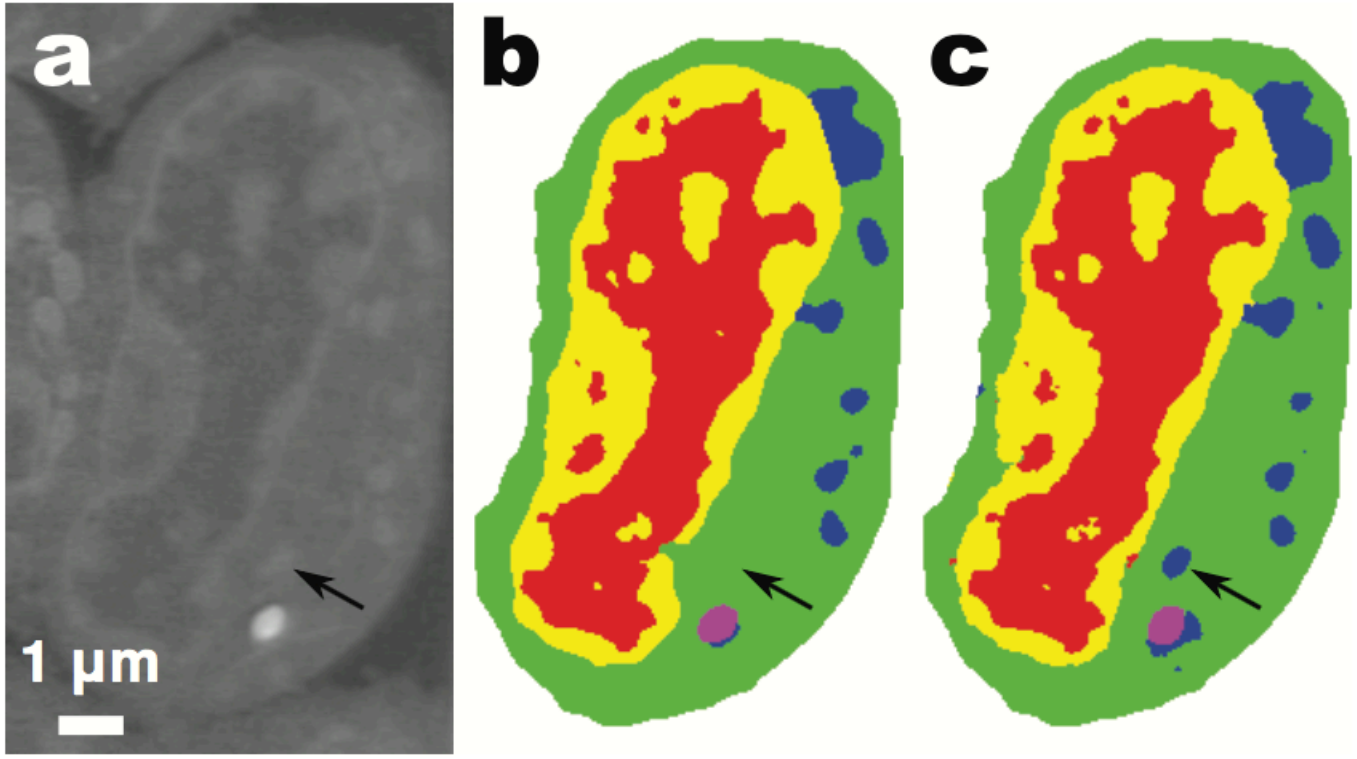
Segmenting simulated data



Example of the segmentation problem of the simulated dataset,

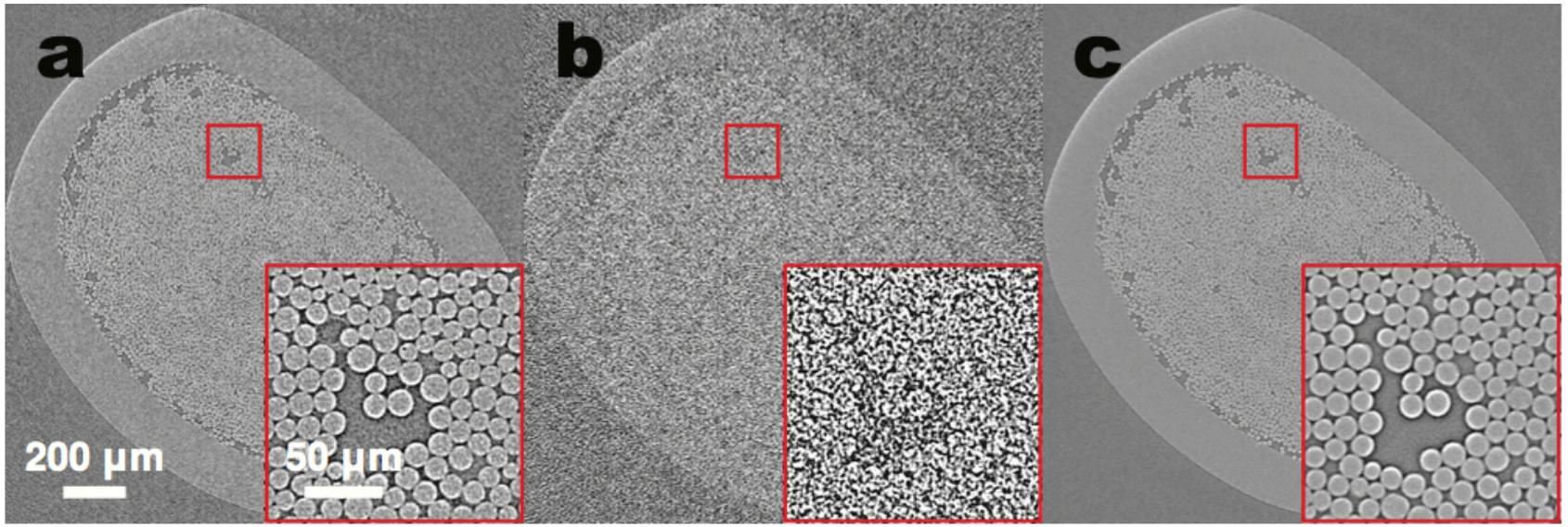
Application

- Segmenting biomedical images



Application

- Denoising large tomographic images



Thank you