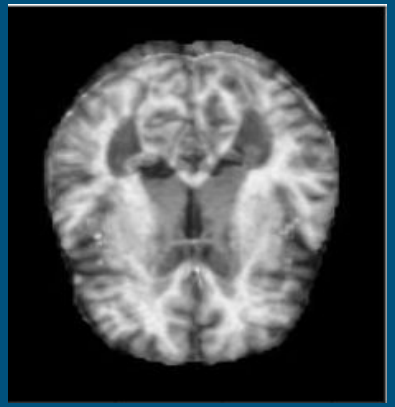
Effects of data augmentation and pooling

Data augmentation

Mix up trans



$$image_{mixed} = t * image1 + (1 - t) * image2$$

Rigid trans

$$image_{trans} = T(image)$$

Max pooling vs convolution

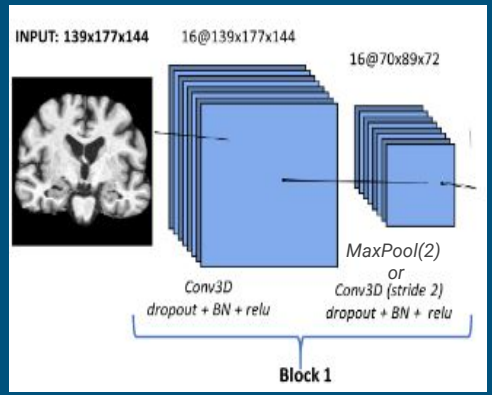
- Springenberg found max pooling can be replaced by conv with stride 2
- Based on this we trained with two networks: one with a pooling layer and the other with convolution
- Result: network with convolution yielded better results on medical image classification for both data augmentation cases

	Tumor dataset	Alzheimer's dataset
Conv stride	TrA: 53%, TeA: 52%	TrA: 35%, TeA: 34%
Max pooling	TrA: 47%, TeA: 40%	TrA: 21%, TeA: 23%

Figure 1. Standard data augmentation

	Tumor dataset	Alzheimer's dataset
Conv stride	TrA: 27%, TeA: 26%	TrA: 35%, TeA: 35%
Max pooling	TrA: 27%, TeA: 26%	TrA: 23%, TeA: 20%

Figure 2. Mixed data augmentation TrA = Training Accuracy, TeA = Test Accuracy



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