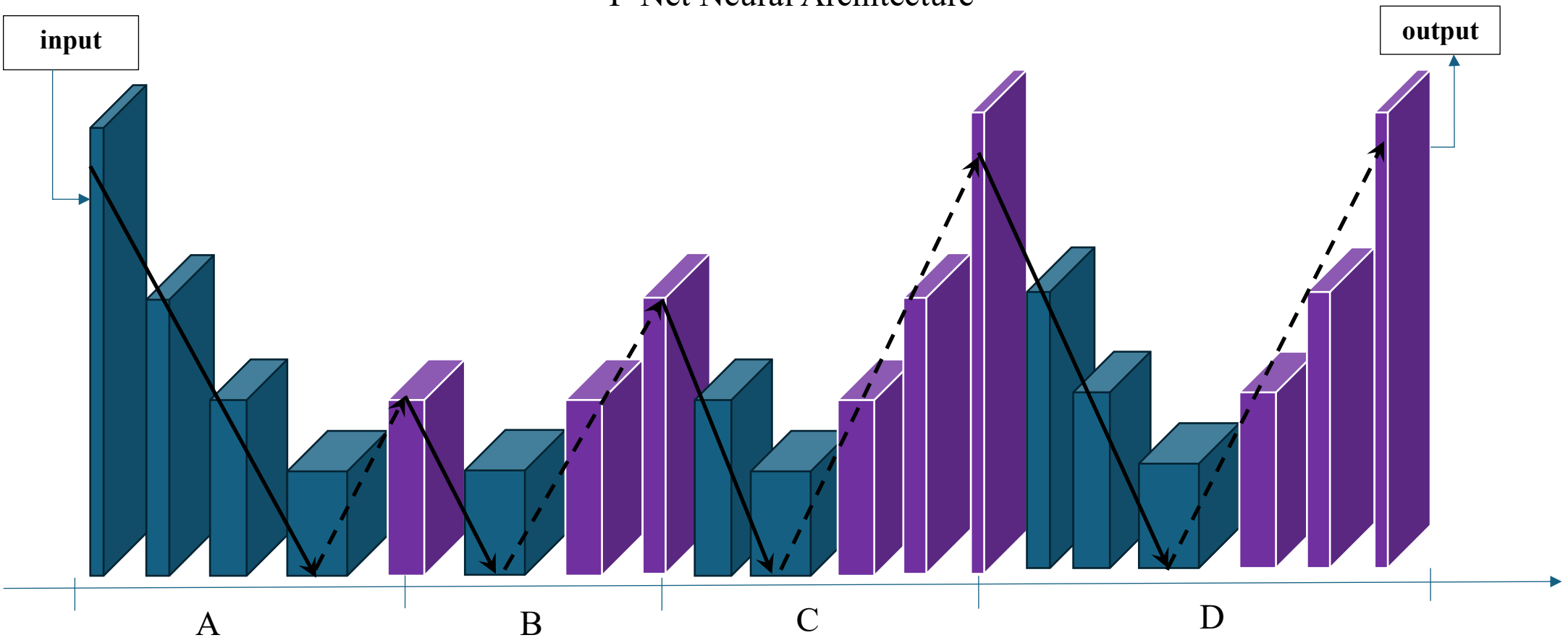
F-Net Neural Architecture[1]



Key

Encoding

Decoding

Convolutional block (2 Convolutions, 2 batch normalizations, 2 Relu) + MaxPool + Residual

Deconvolutional block (2 deconvolutions, 2 batch normalizations, 2 Relu) + Upsampling + Residual

[1] Inspired by the and Multigrid F-cycle and the U-Net architecture for semantic segmentation

	N-filter convolutional block		N-filter deconvolutional block
1	Relu activation	1	Relu activation
2	Conv (filters=N, size=3)	2	Deconvolution (filters=N, size=3)
3	Bach Normalization	3	Batch Normalization
4	Relu activation [2]	4	Relu activation
5	Conv (filters=N, size=3)	5	Deconvolution (filters=N, size=3)
6	Bach Normalization	6	Batch Normalization
7	Maxpooling (size=3, stride=2)	7	Upsampling (size=2)
8	Residual (add output of previous block)	8	Residual (add upsampled output of previous block)

Padding is added for each convolutional and deconvolutional layer such that the layer output has the same size as the layer input. Changes in input sizes are designed to take place at the max-pooling and up-sampling layers.

Example distribution of filters (N = 32, 64, 128, 256) convolutional sizes along different blocks in a 4-level F-Net

		Encoder blocks				Decoder blocks			
	Image size	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
Level 1	96x96	32			32			32	32
Level 2	48x48	64		64	64		64	64	64
Level 3	24x24	128	128	128	128	128	128	128	128
Level 4	12x12	256	256	256	256	256	256	256	256

[2] For the first convolutional block only steps 2-4 are applicable