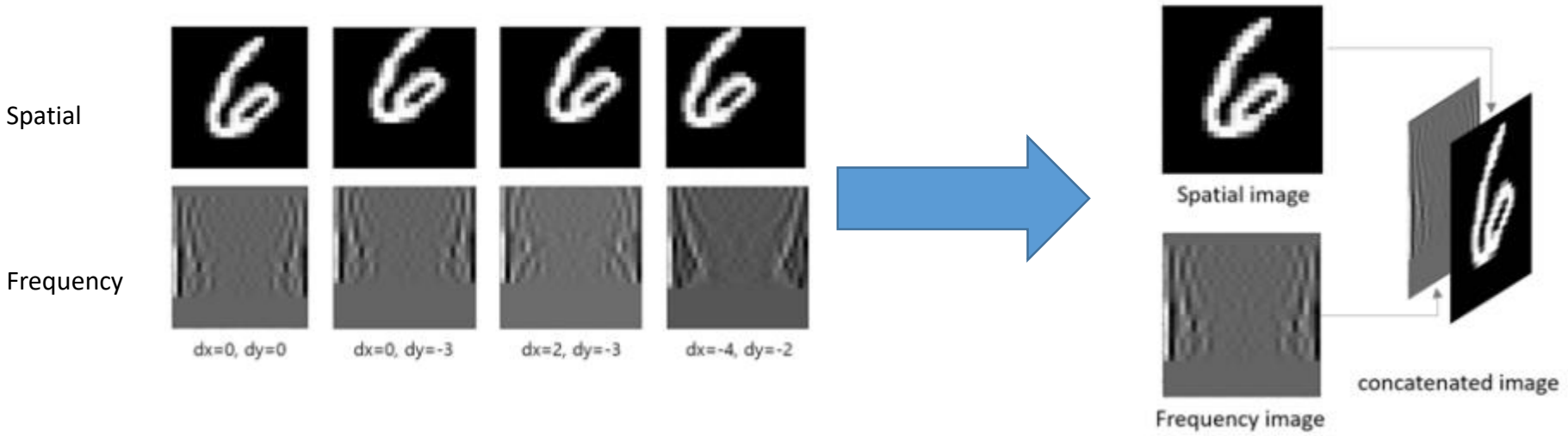
AI Researches and Paper summary

Paper Name: Extending Input Channel Using Global Feature Image for Convolutional Neural Networks

Paper link : https://ieeexplore.ieee.org/document/8960966

Short explanation about paper: All digits are centralized in MNIST. However, if the digit is shifted from the center, the accuracy will decrease. Fast Fourier Transform (FFT) can produces similar frequency image from shifted images.



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Result: The following table is the accuracy comparison result among spatial, frequency, and concatenated image. You can see, mostly the concatenated achieve higher accuracy than others

Translation (dx, dy)	Spatial image	Frequency image	Concatenated image
0,0	**99.53**	97.72	99.51
0,-3	93.17	84.63	**94.37**
2,-3	92.13	79.60	**93.51**
4,0	92.15	76.39	**93.42**
2,3	91.21	74.51	**93.39**
0,3	94.66	86.33	**94.95**
-4,3	88.77	60.26	**91.07**
-5,0	85.20	61.16	**88.89**
-4,2	82.75	60.43	**88.67**
-3,-2	91.54	71.37	**94.37**
Total	91.11	75.24	**93.21**
deviation	4.71	12.44	**3.15**