




Homework #3 – Motion Estimation & Compensation

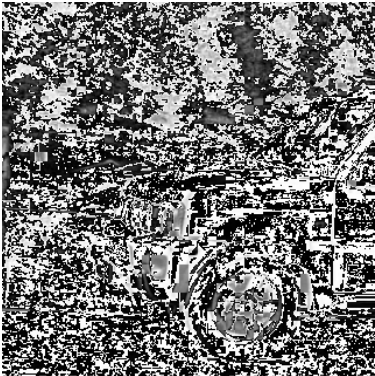
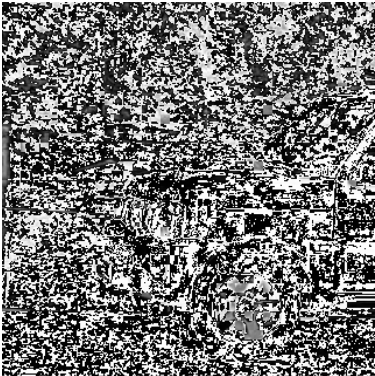
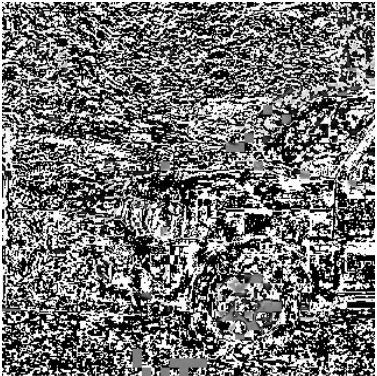
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Full search block matching

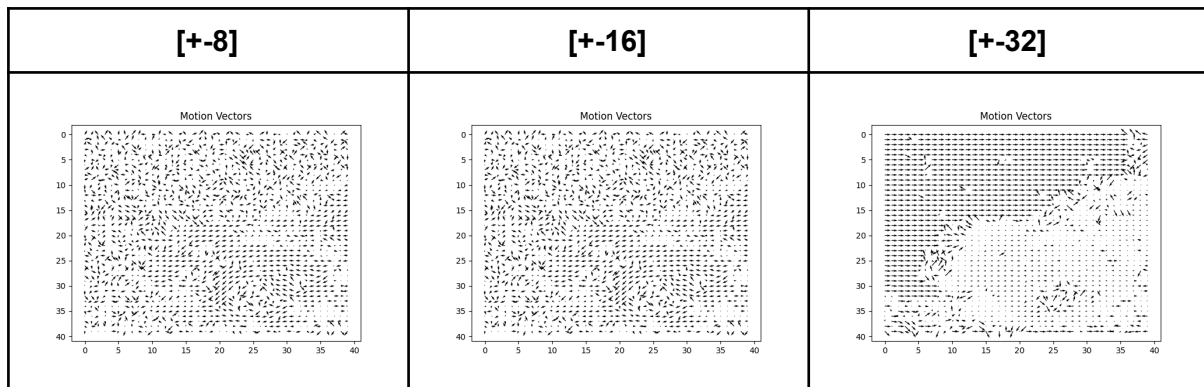
Reconstructed frame

[+8]	[+16]	[+32]
		

Residual

[+8]	[+16]	[+32]
		

Motion vectors



PSNR

[+8]	[+16]	[+32]
31.58	32.34	33.91

The larger the search range, the higher the PSNR, indicating better quality of the reconstructed image.

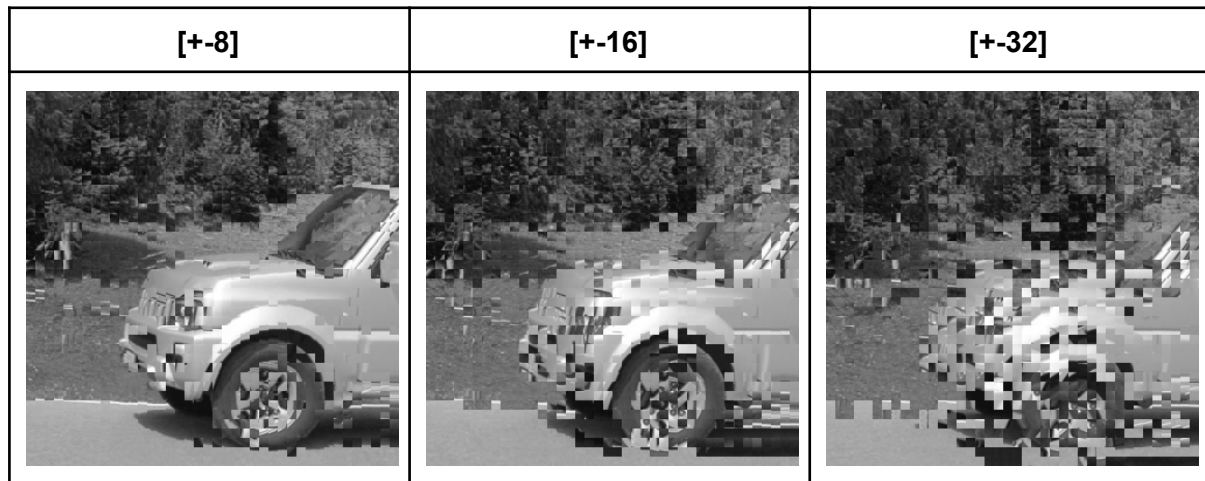
Runtime

[+8]	[+16]	[+32]
1.17 sec	4.24 sec	14.97 sec

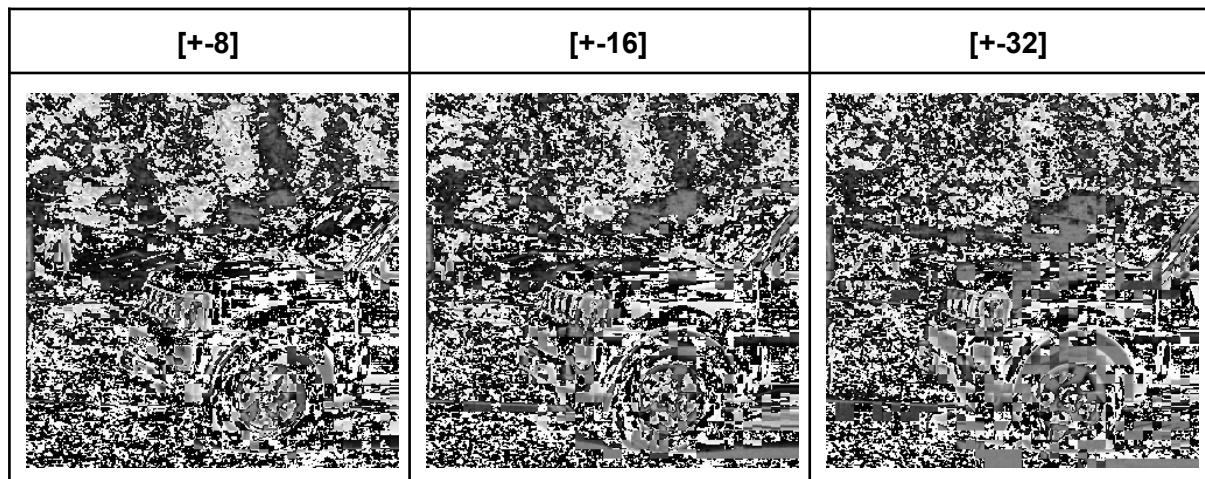
The larger the search range, the greater the runtime, indicating a higher search complexity.

Three-step search

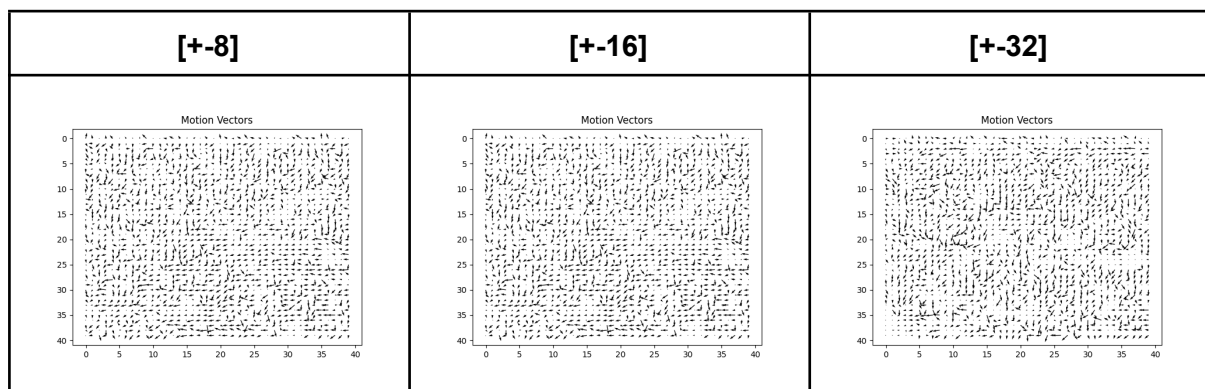
Reconstructed frame



Residual



Motion vectors



PSNR

[+-8]	[+-16]	[+-32]
30.81	30.65	30.59

As the search range increases, the PSNR actually decreases, indicating that the quality of the reconstructed image worsens. Furthermore, the PSNR of the three-step search is still worse than that of the full search block matching.

Runtime

[+-8]	[+-16]	[+-32]
0.12 sec	0.15 sec	0.19 sec

The larger the search range, the greater the runtime, indicating a higher search complexity. However, the runtime of the three-step search is smaller than that of full search block matching.