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Avancement Simulateur IQ

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Segmentation : Modèle bloc 8x8

10/01/2024

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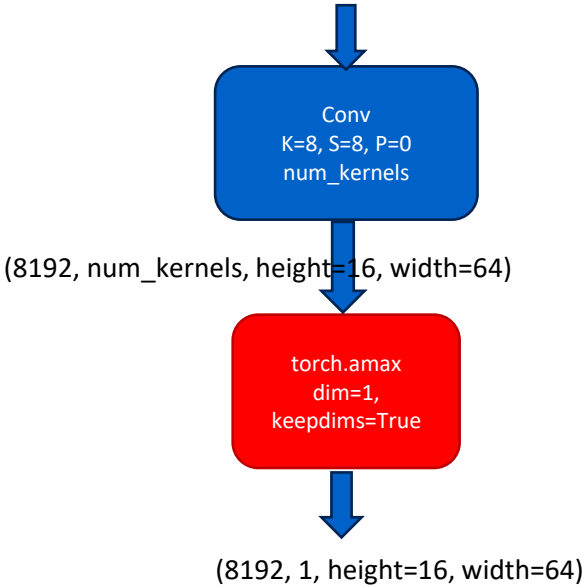
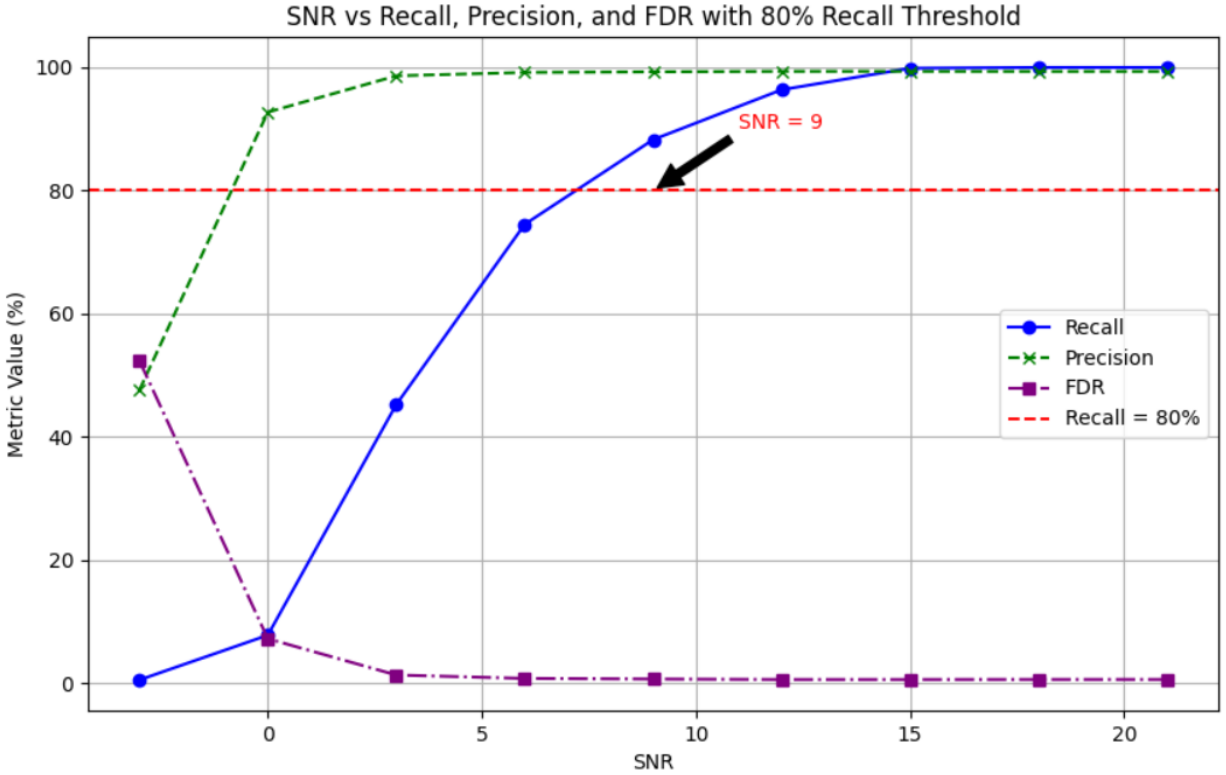
Conv + Amax: k=8, s=8, p=0

Tous les npersegs, sans overlap
Sxx_tiles (8192, 1, height=128, width=512)
Correspond à un dt_iq de 16,78 ms



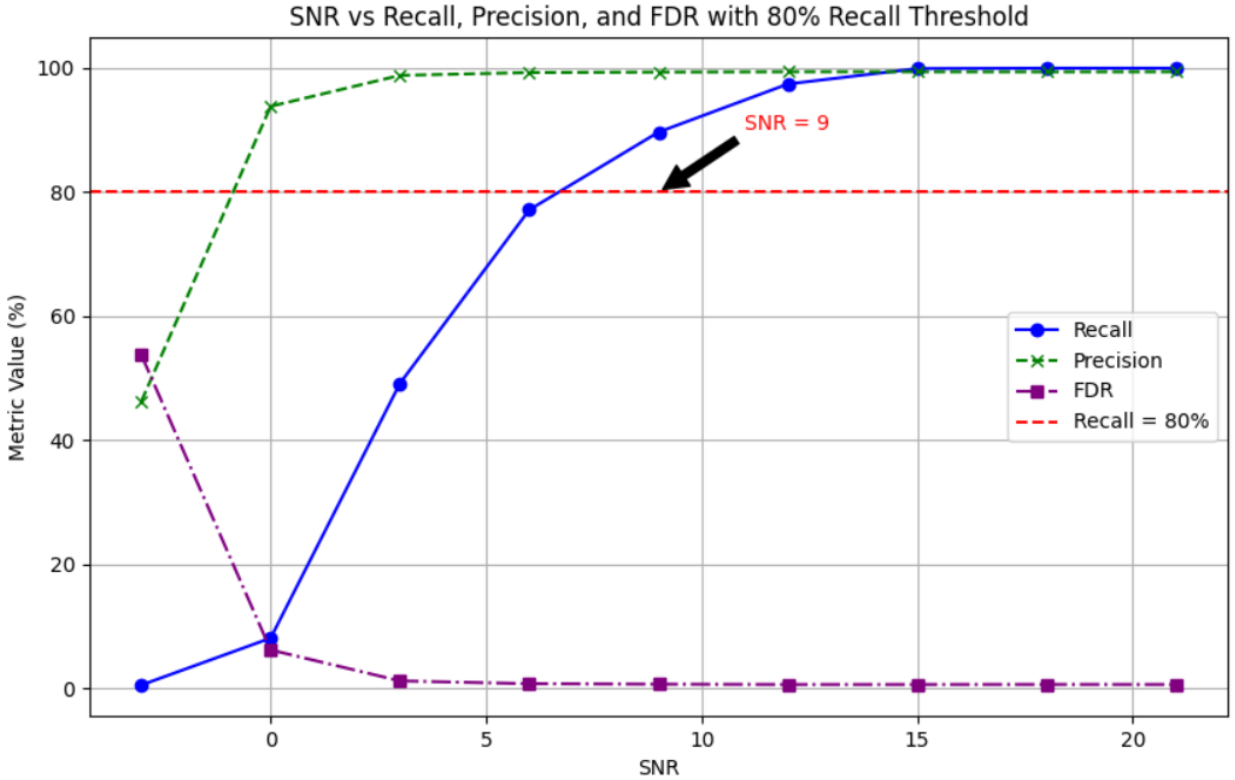
num_kernels	RTR@%gpu_util	SNR@recall>80%
1	0,5@35	9
2	0,7@35	9
4	0,7@36	9
8	0,63@34	9
16	1@35	9
32	1,31@35	6

Résultats à 1 channel



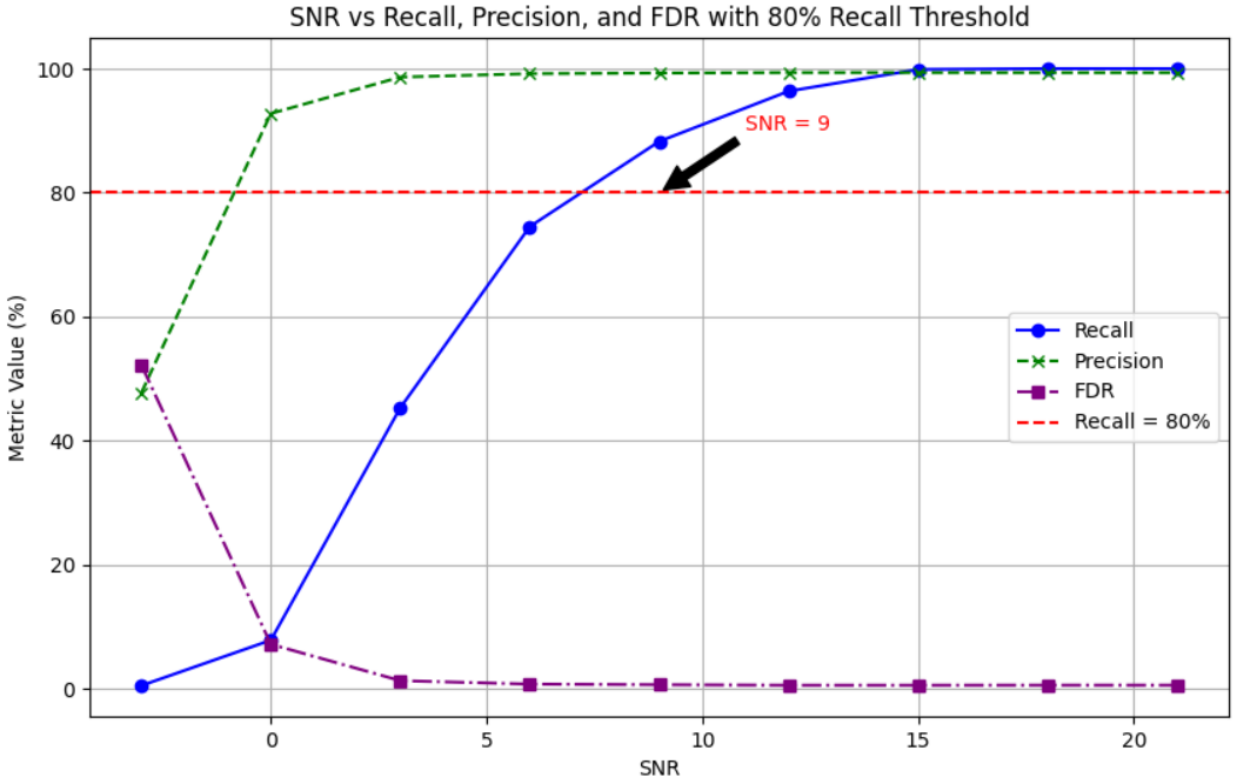
On est bien meilleur à 6dB comparé au bloc 2x2 où l'on avait 39% de recall

Résultats à 2 channels



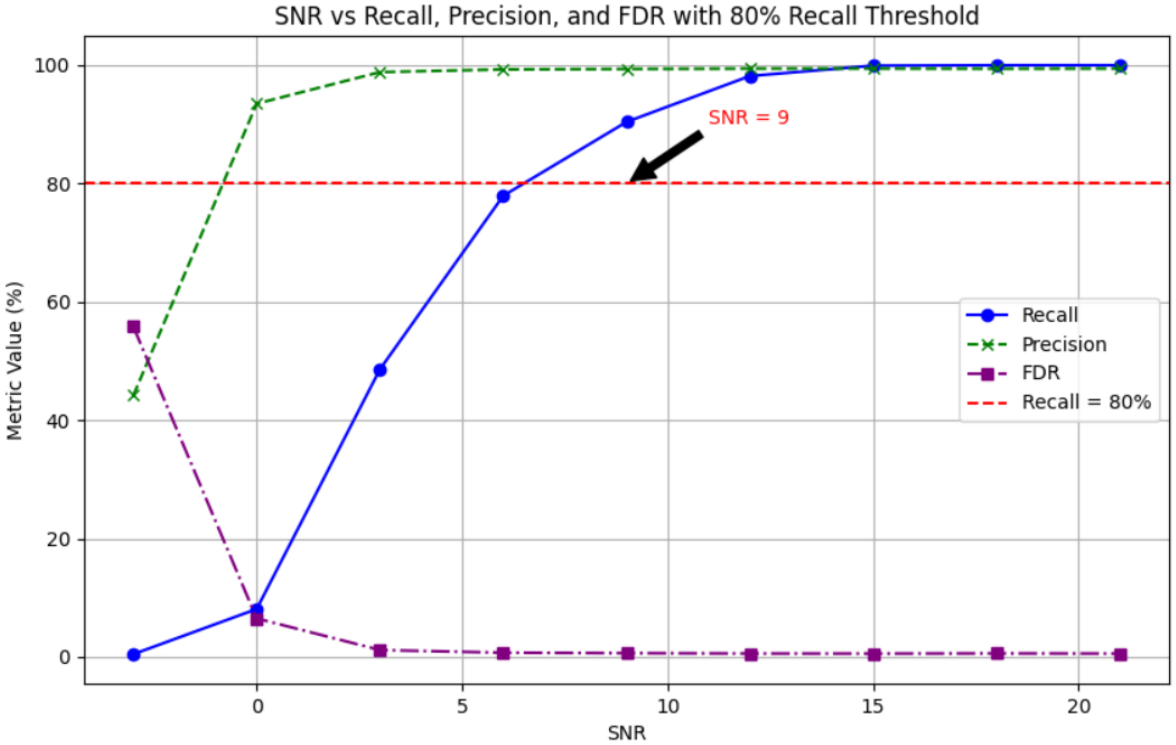
Perf stable

Résultats à 4 channels



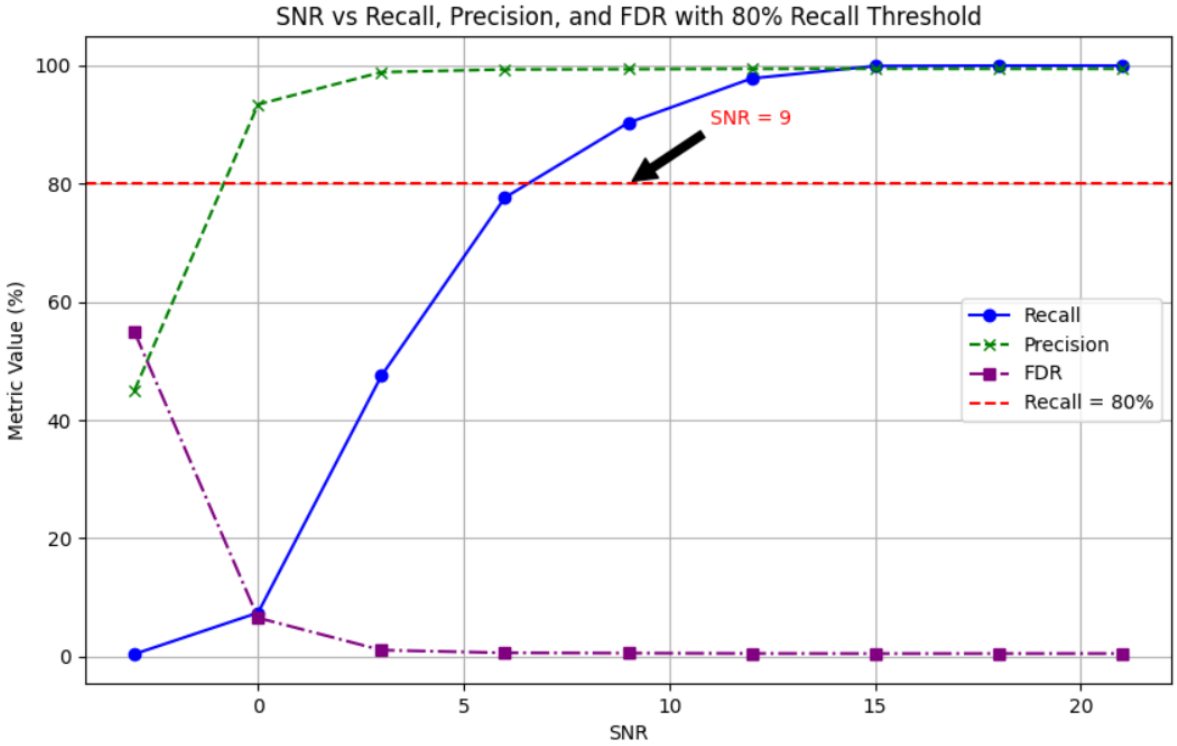
Perf stable

Résultats à 8 channels



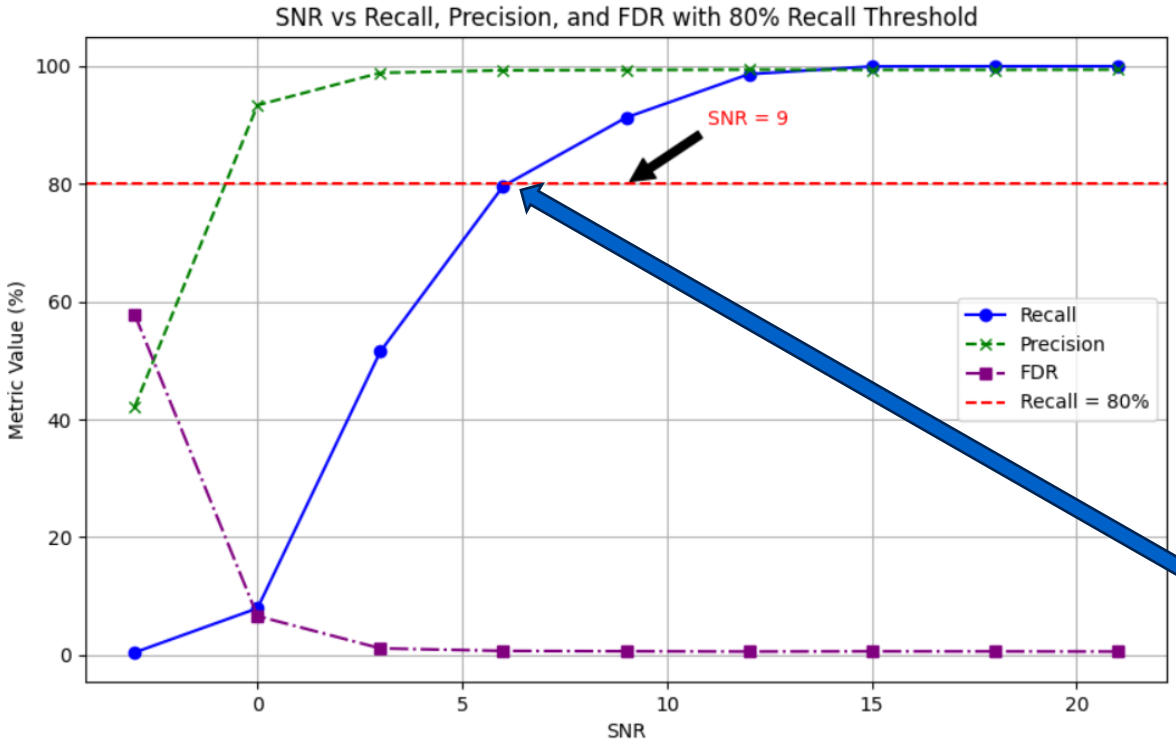
Perf stable

Résultats à 16 channels



Perf stable

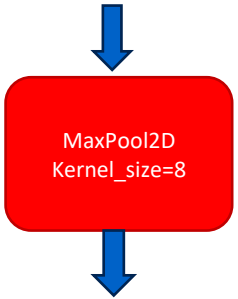
Résultats à 32 channels



Quasi 80% recall @ 6dB

MaxPool2D

Tous les npersegs, sans overlap
Sxx_tiles (8192, 1, height=128, width=512)
Correspond à un dt_iq de 16,78 ms

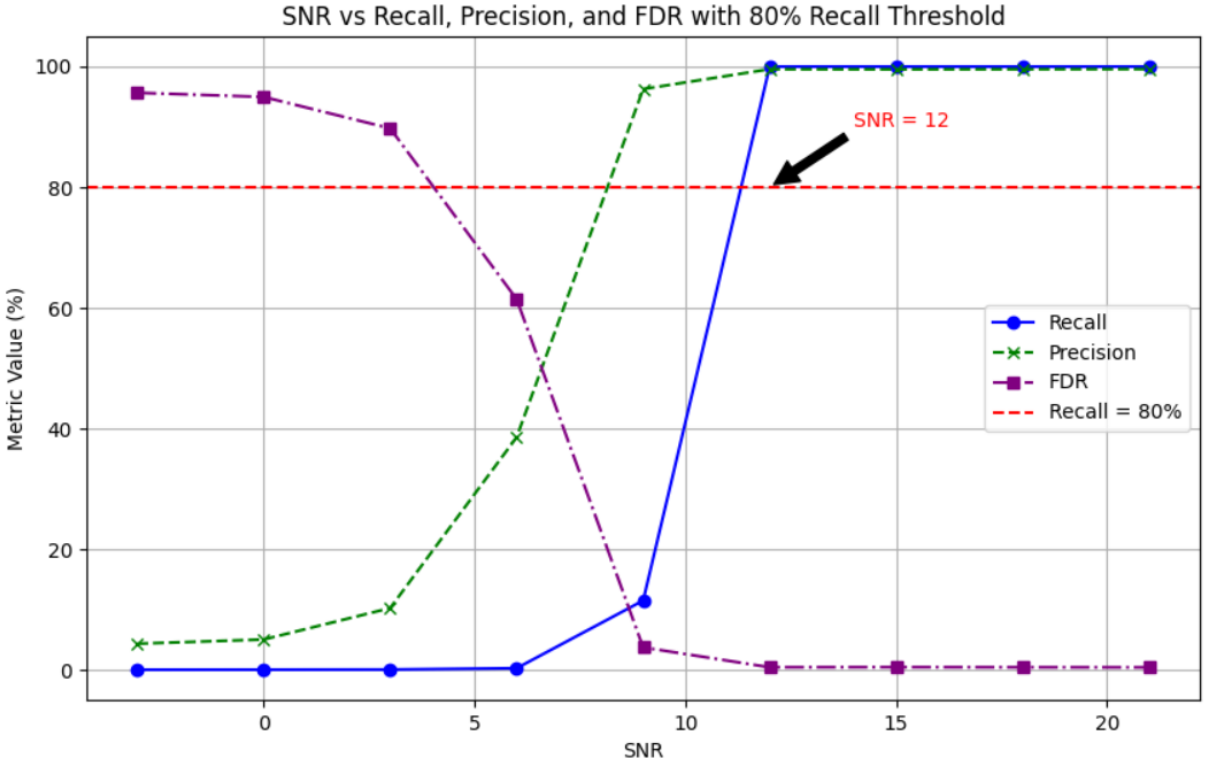


(8192, 1, height=16, width=64)

RTR@%gpu_util :
0,11@35

SNR@recall>80% = 12dB

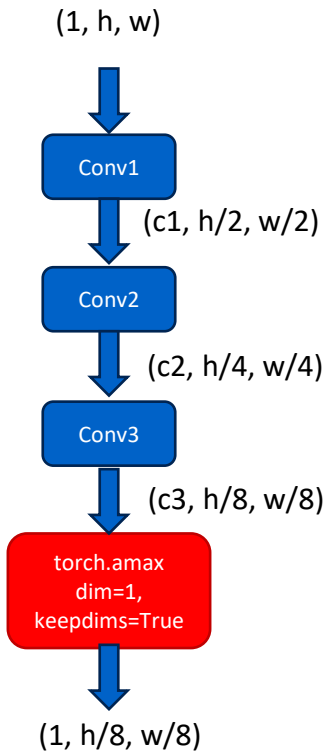
Résultats avec MaxPool2D



Forte baisse de perf à SNR=9dB sinon tjrs ok à SNR>=12dB

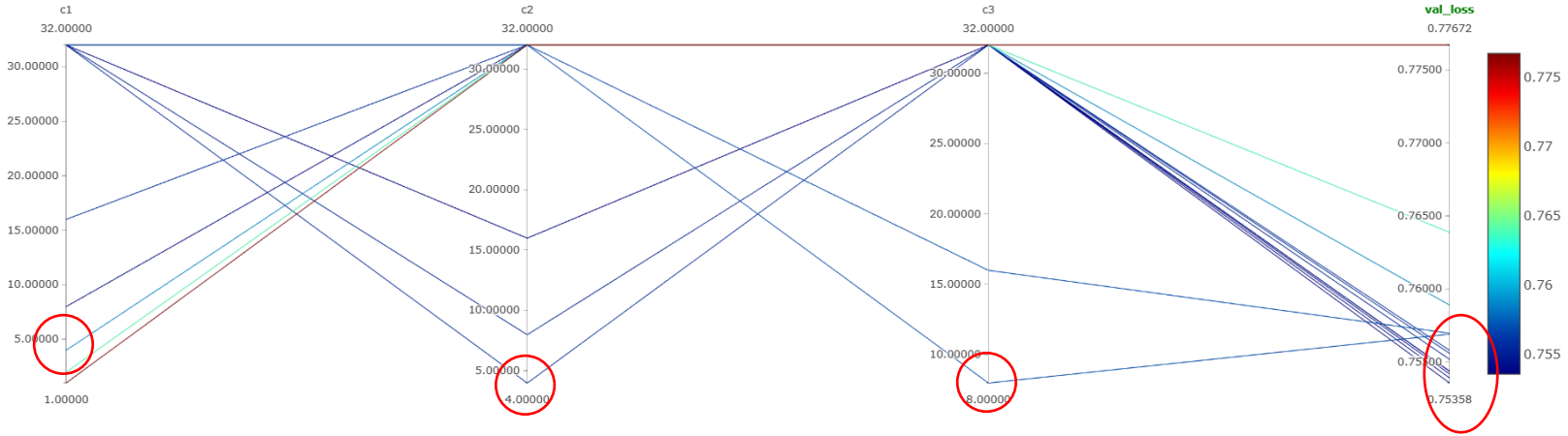
Modèle à utiliser sur un système low power

Convs + Amax: k=2, s=2, p=0



Convs + Amax: k=2, s=2, p=0

Test de différentes configurations c1, c2, c2 en fixant deux à 32 channels et le dernier varie parmi les valeurs suivantes [1, 2, 4, 8, 16, 32]

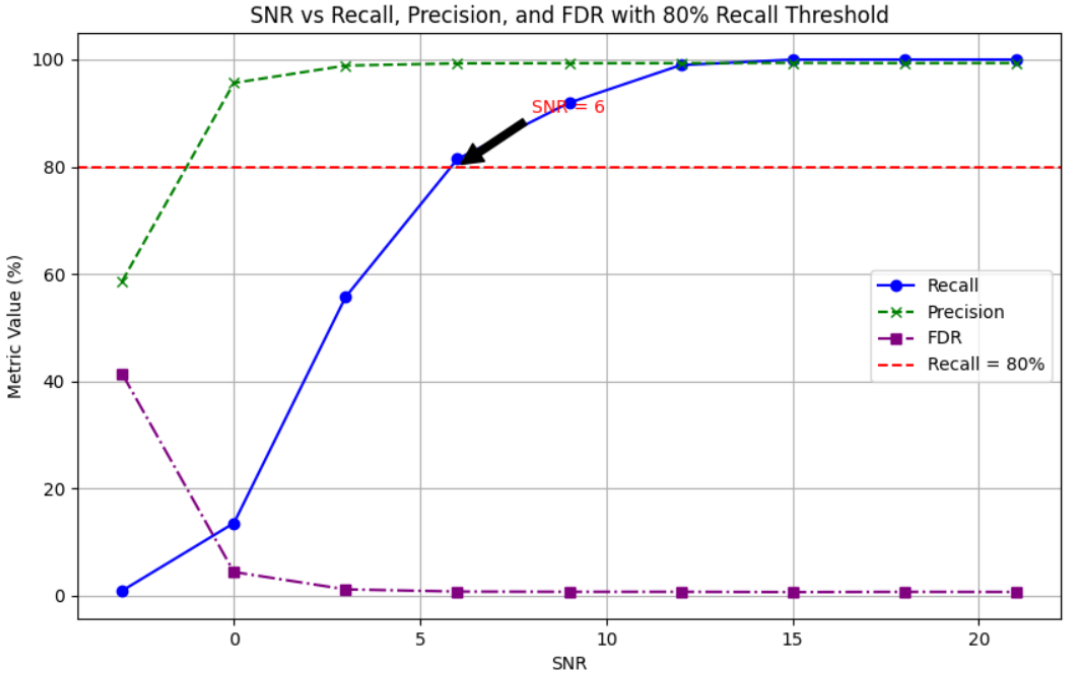


Les résultats montrent qu'il est préférable d'avoir moins de filtres en amont qu'en aval.

Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

Test c=4, c2=4 et c3 = 8

run_2024-11-08_09-20-28



RTR@%gpu_util =1,65@53%

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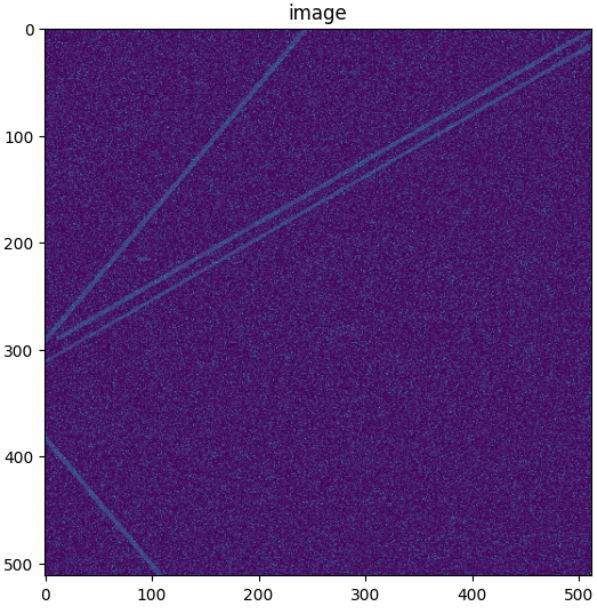
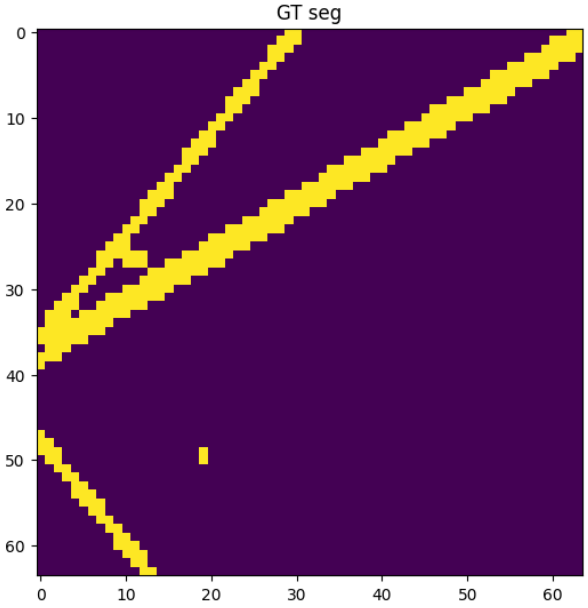
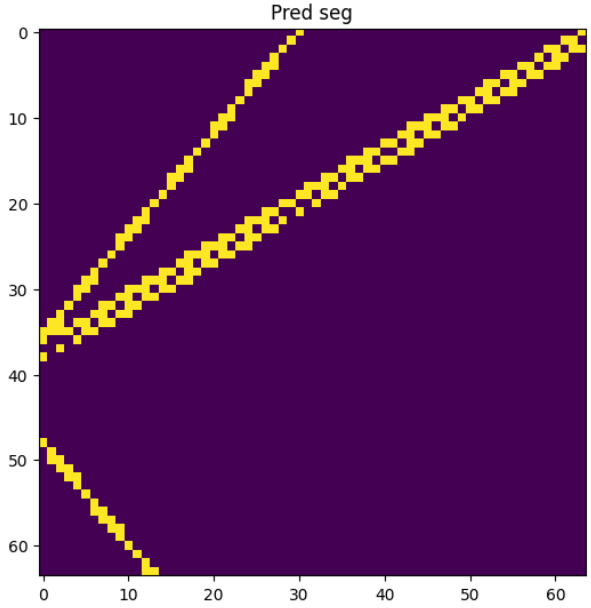
Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

/data/SIGINT/bt_simple_pulses_seg/BLOC_SIZE_8/images/test/image_2799_3_dB.pt

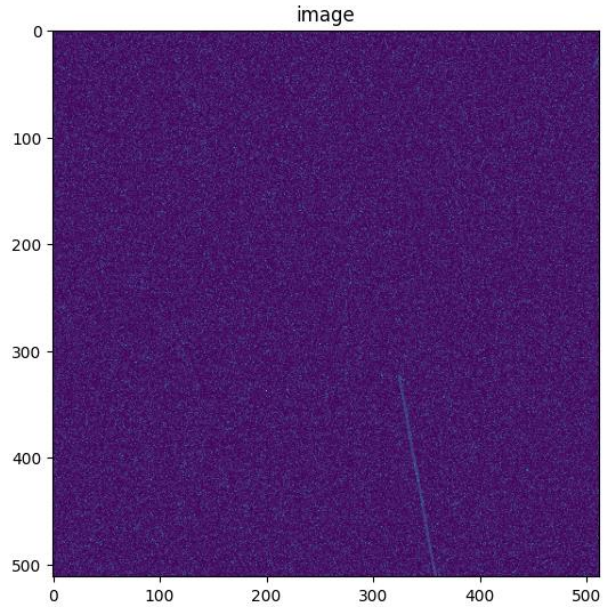


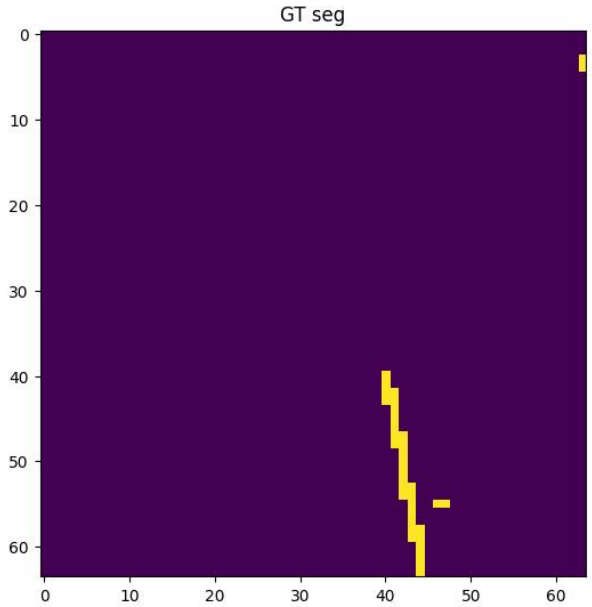


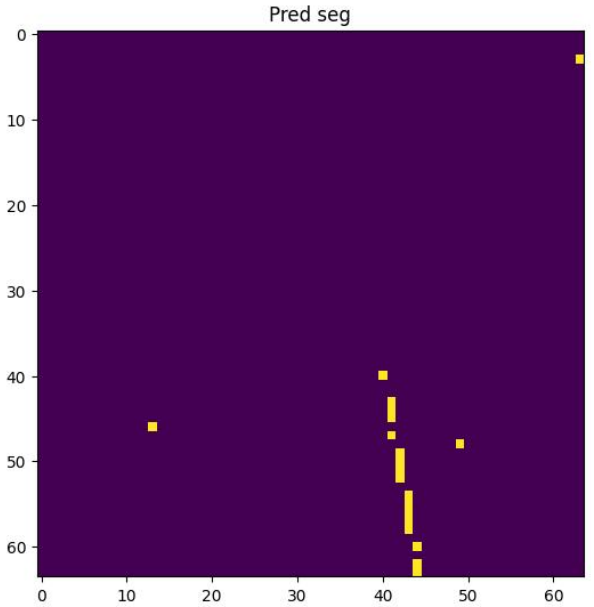


Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

/data/SIGINT/bt_simple_pulses_seg/BLOC_SIZE_8/images/test/image_12583_3_dB.pt

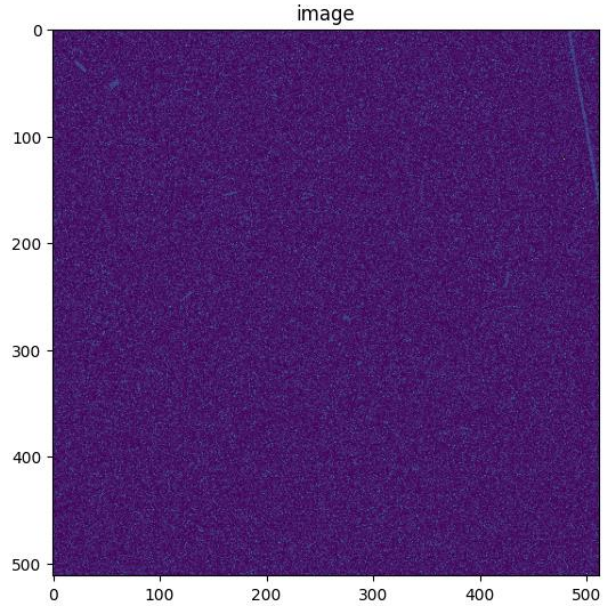


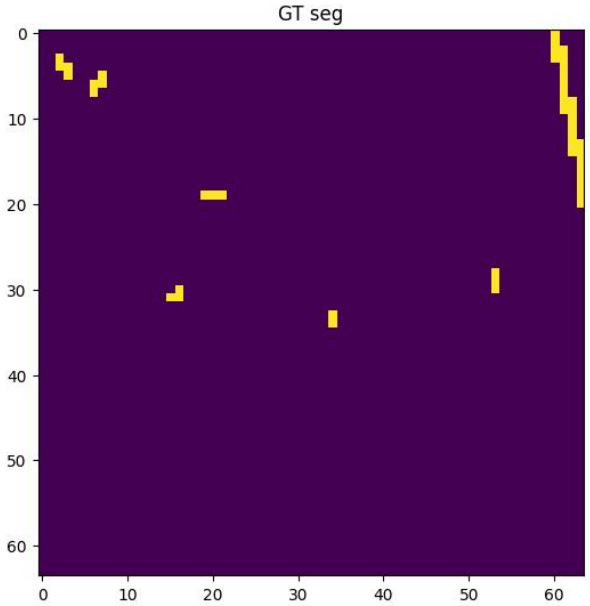


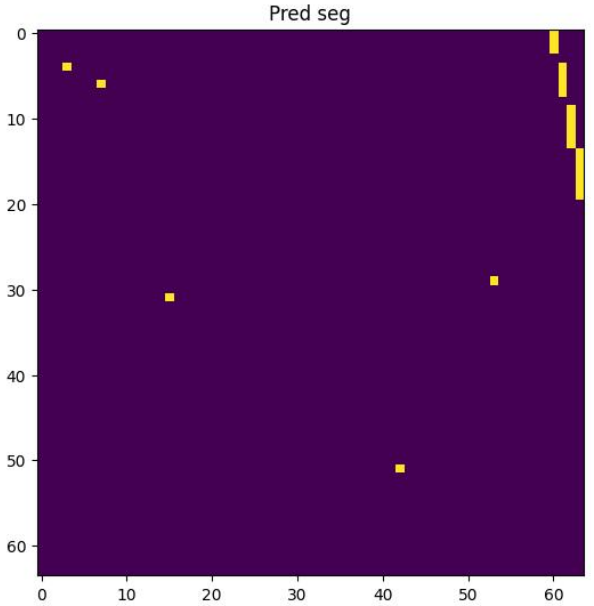


Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

/data/SIGINT/bt_simple_pulses_seg/BLOC_SIZE_8/images/test/image_22730_3_dB.pt

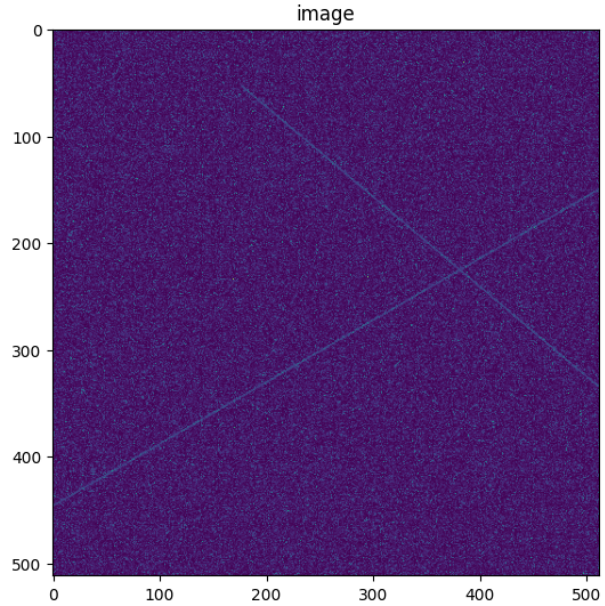


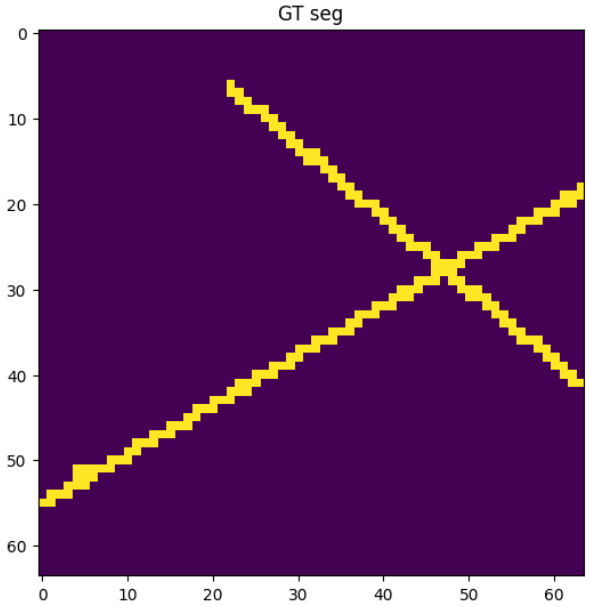


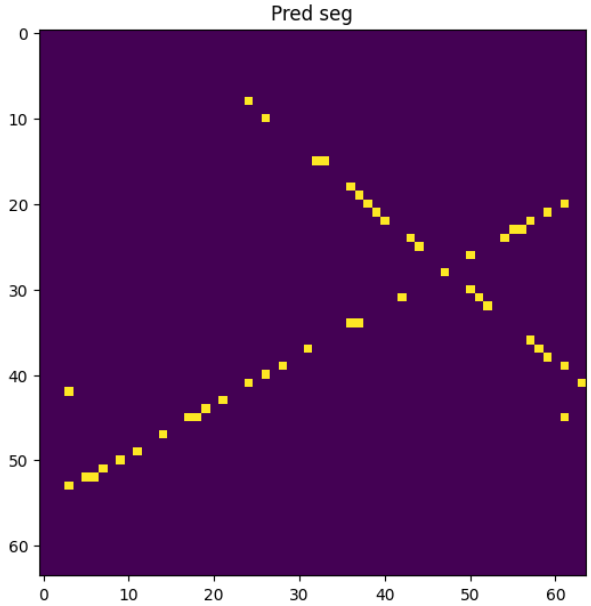


Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

/data/SIGINT/bt_simple_pulses_seg/BLOC_SIZE_8/images/test/image_38_3_dB.pt

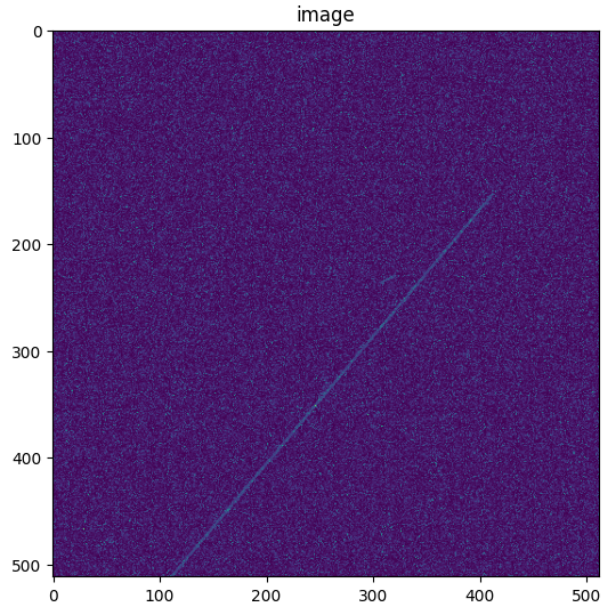


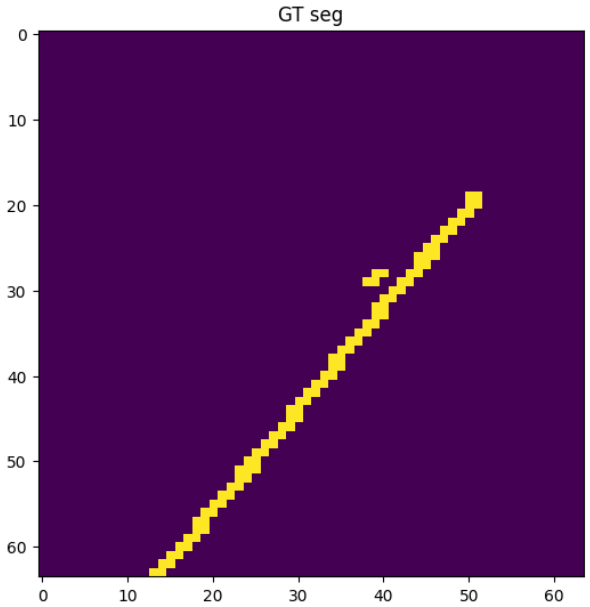


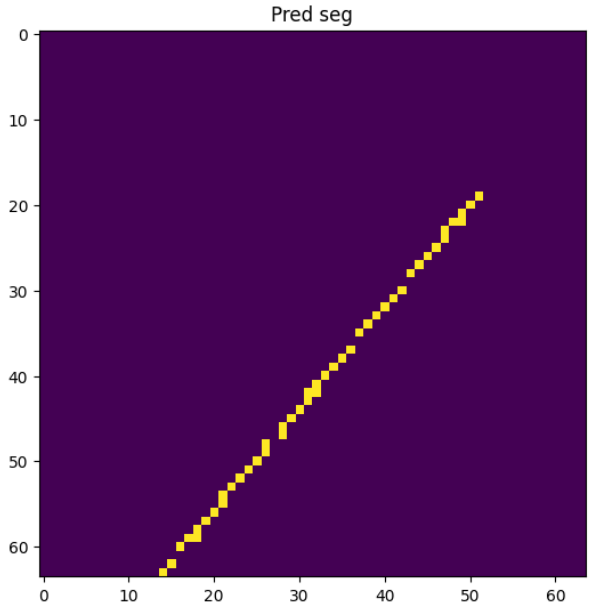


Convs + Amax: k=2, s=2, p=0 → Modèle gagnant

/data/SIGINT/bt_simple_pulses_seg/BLOC_SIZE_8/images/test/image_10913_3_dB.pt

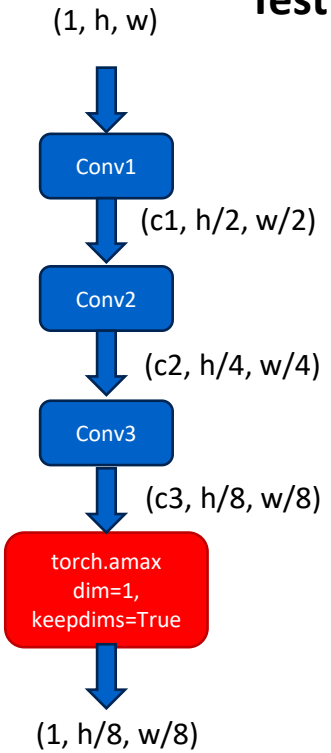




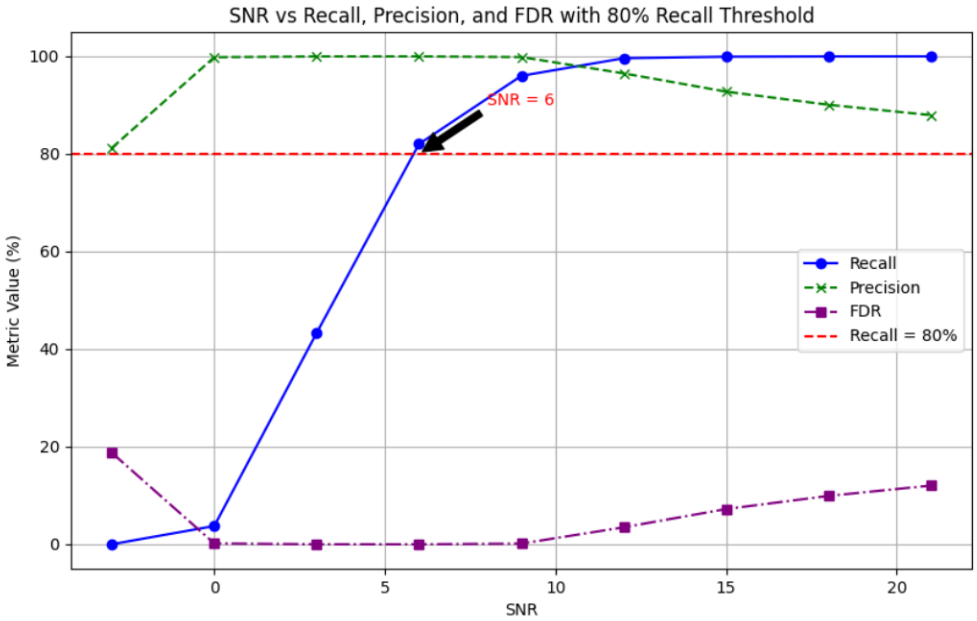


Convs + Amax: k=4, s=2, p=1

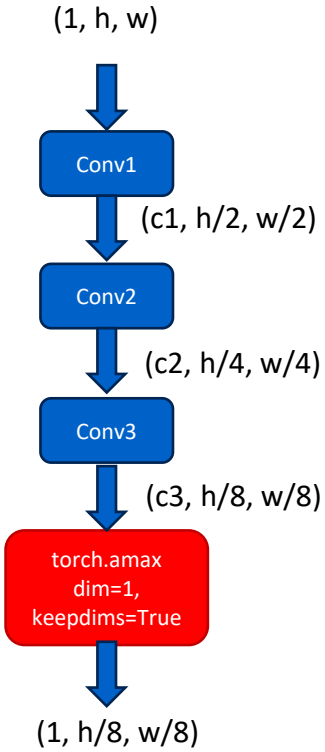
Test c=4, c2=4 et c3 = 8



run_2024-11-08_15-07-02
FDR élevé

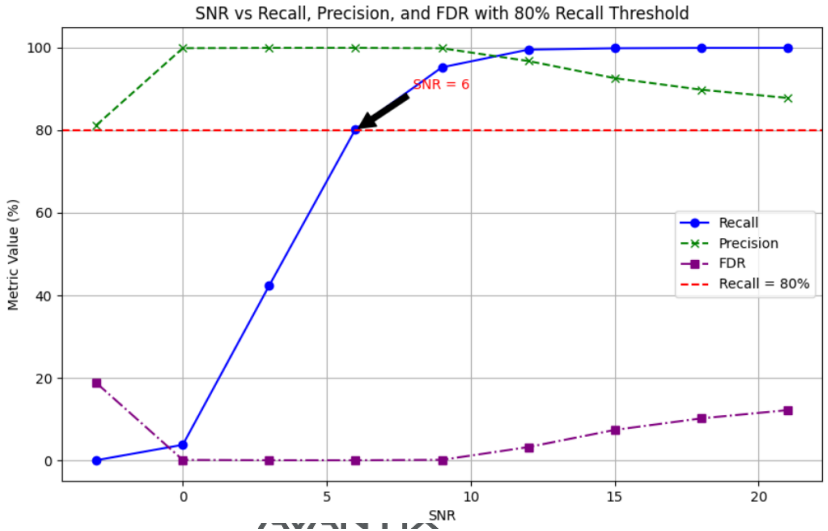


Convs + Amax: k=5, s=2, p=2



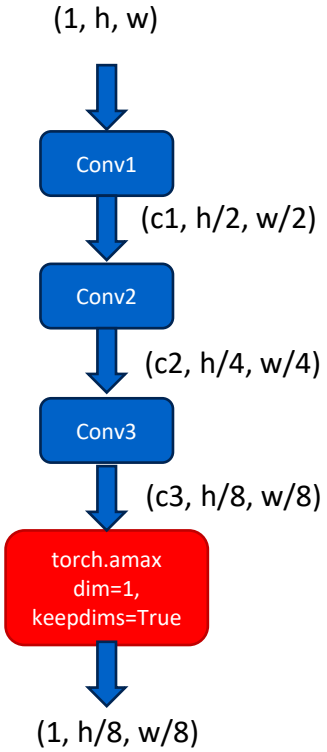
Test c=4, c2=4 et c3 = 8

run_2024-11-08_15-07-21
FDR élevé



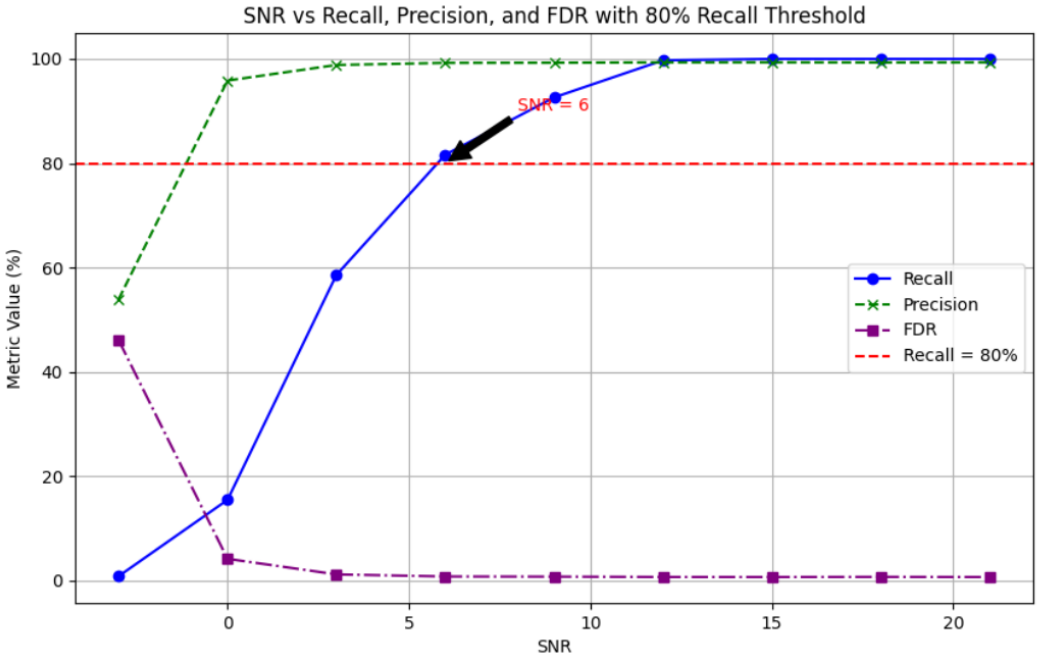
Convs + Amax: k=2, s=2, p=0 version deep

Test c=32, c2=64 et c3 = 128

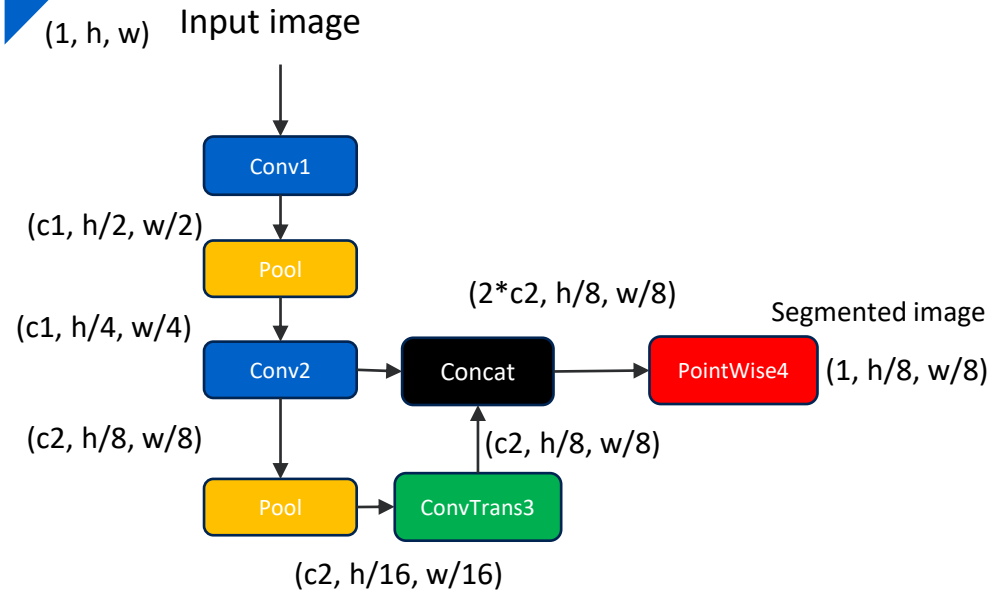


run_2024-11-08_15-30-17

faible gain à 0dB comparé à la version c1=c2=4, c3 = 8

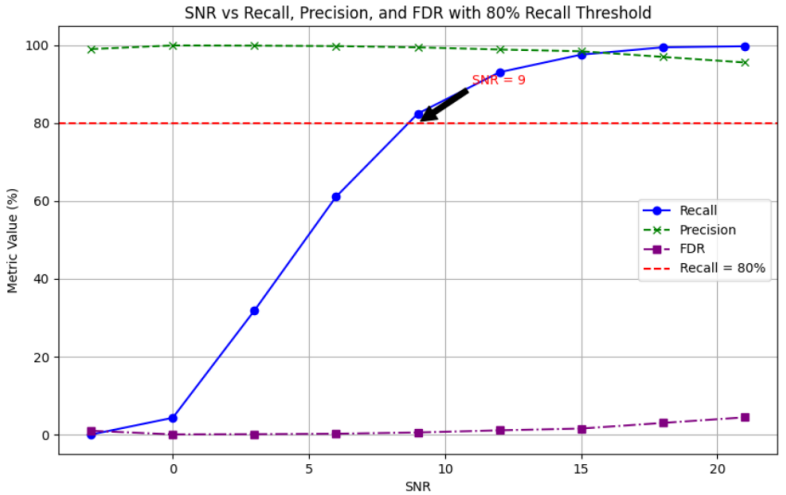


UNet-Like

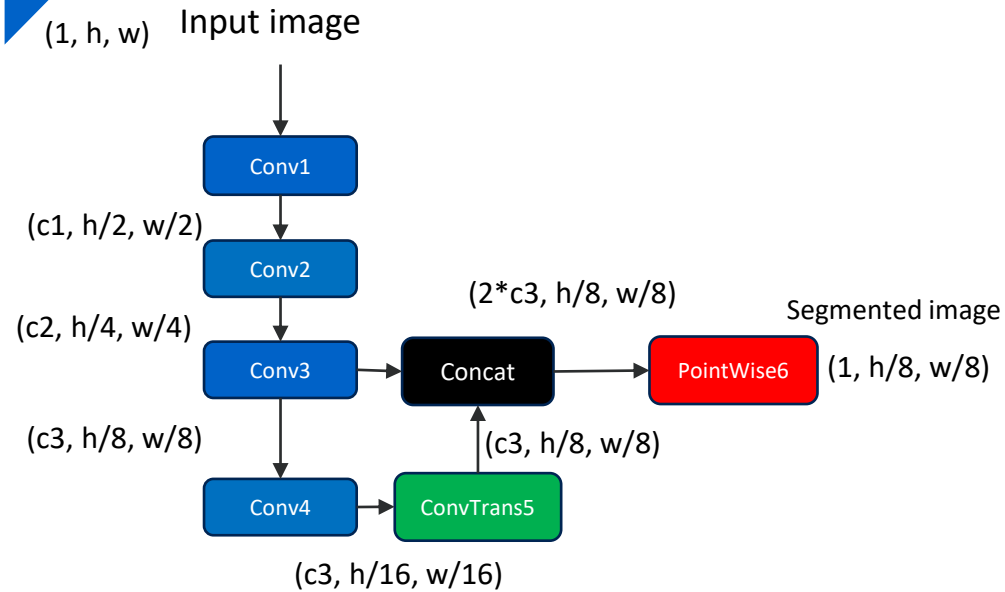


run_2024-11-08_10-47-24

Résultat avec c1 = c2 =32 mauvais

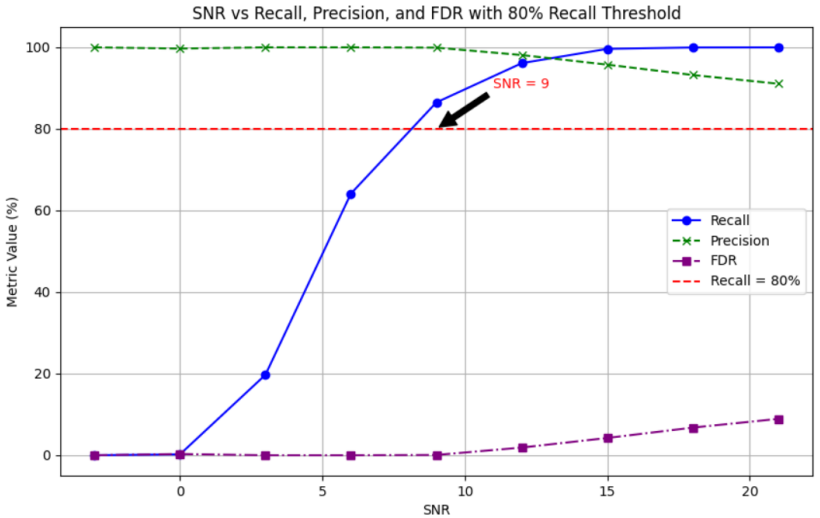


UNet-Like

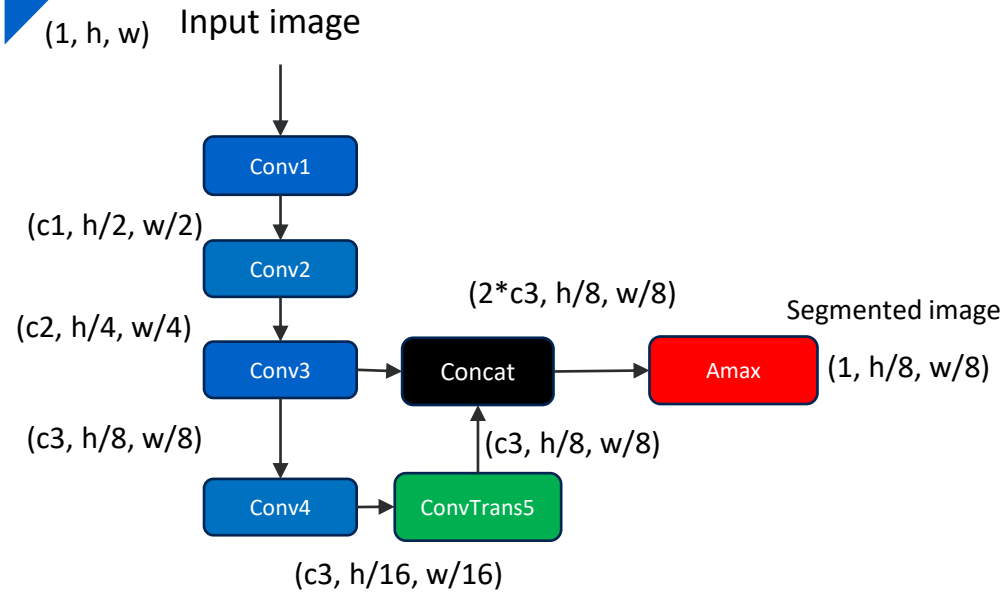


run_2024-11-08_11-32-50

Résultat avec c1 = c2 = c3 =32 mauvais

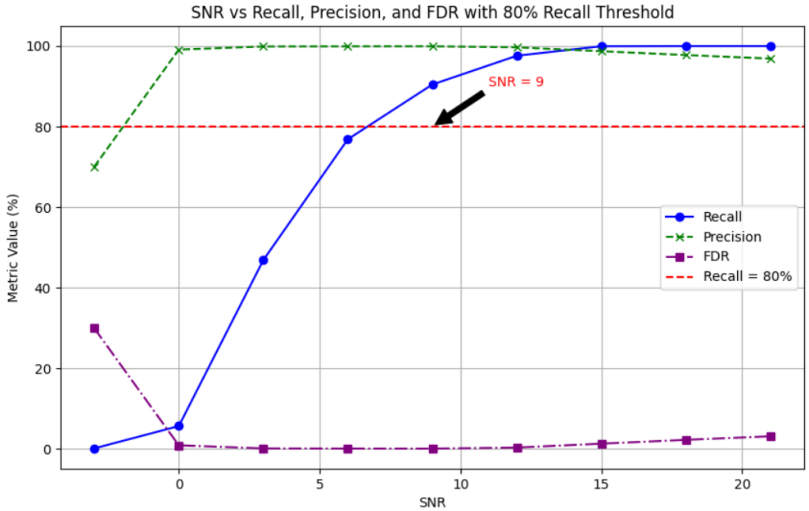


UNet-Like

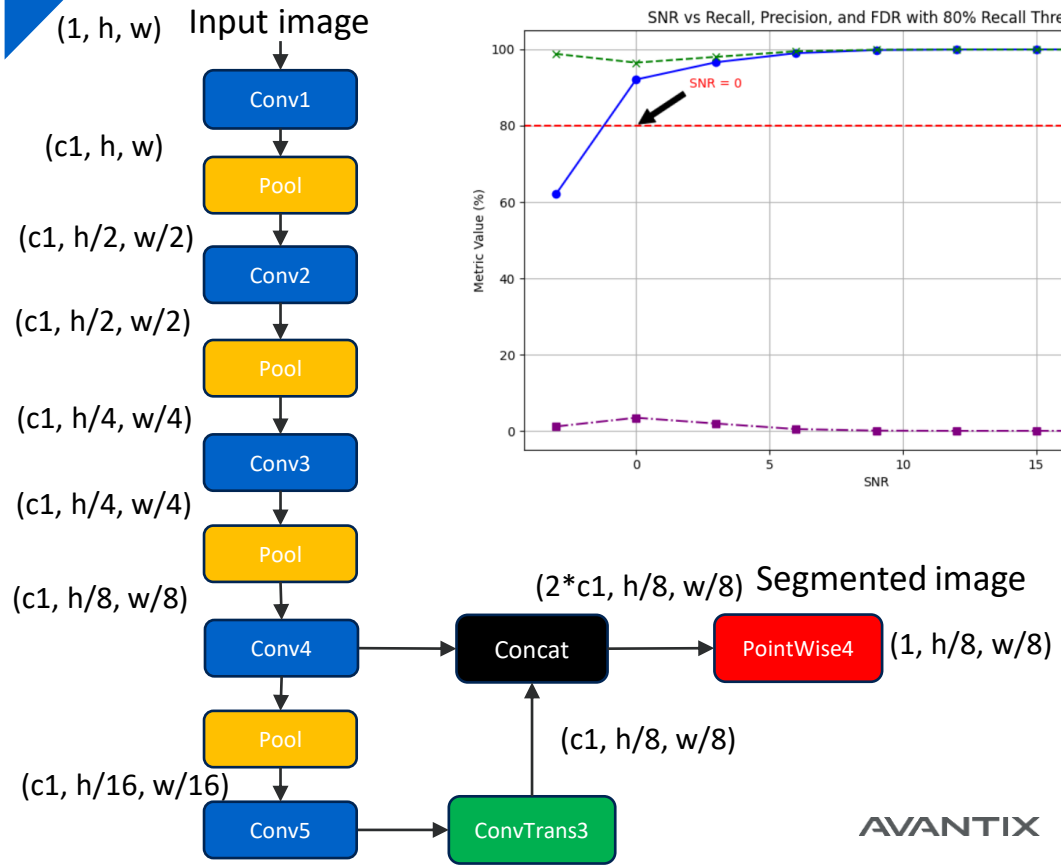


run_2024-11-08_14-22-07

Résultat avec c1 = c2 = c3 =32 tjrs en deçà par rapport à convs+amax. On remarque que ajouter amax a permis de fortement améliorer les performances



UNet-Like



run_2024-11-12_09-21-07

Résultat avec c1 = 128

RTR@%gpu_util =214@76%

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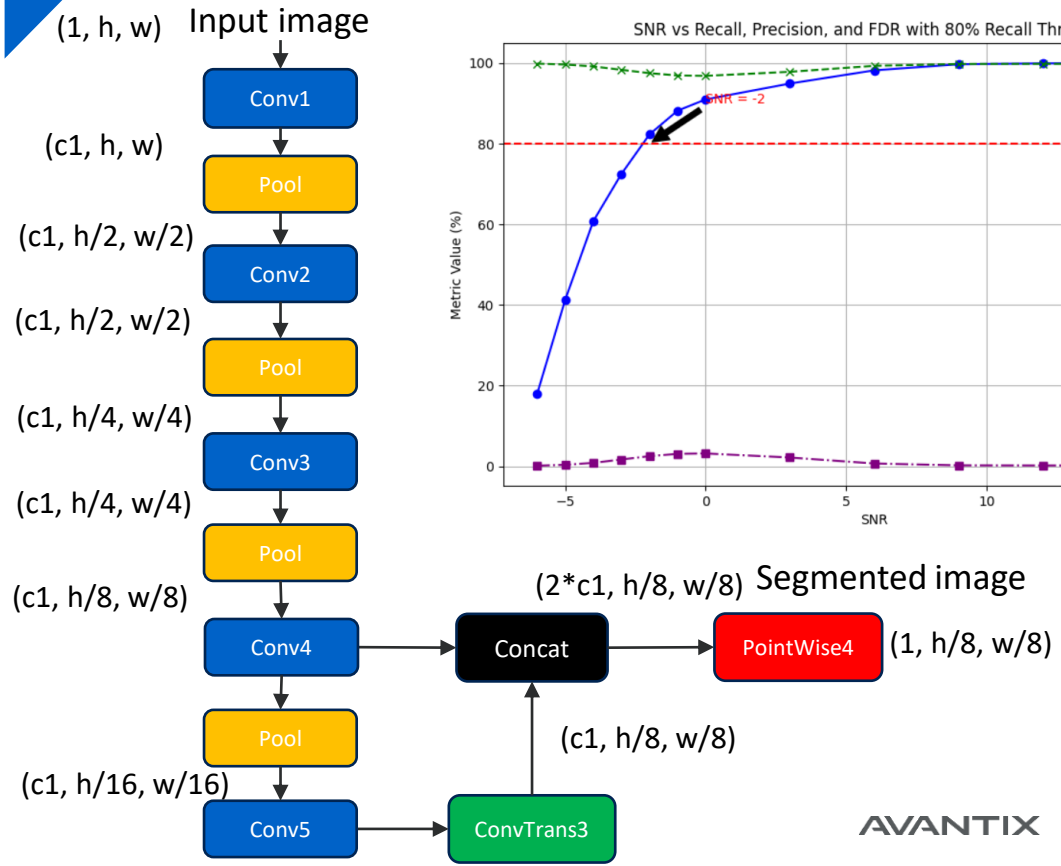
UNet-Like



run_2024-11-12_11-33-41

Résultat avec c1 = 256

RTR@%gpu_util = 483@73%

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Conclusion

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Segmentation → Instance Segmentation

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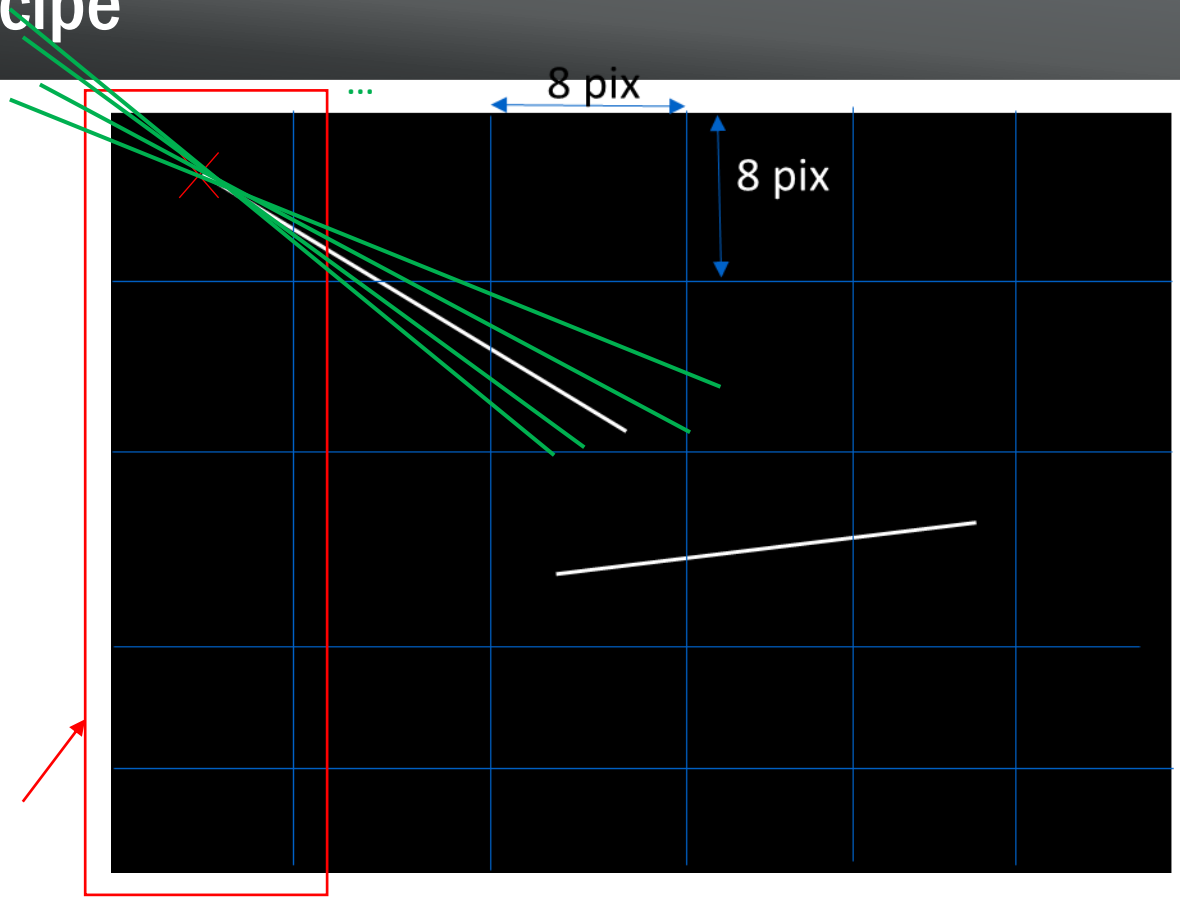
Principe



1. Traitement en parallèle de chaque bloc de la première section temporelle

2. On fait passer N droites sur le premier point détecter d'un bloc et on garde celle avec le plus de pixels qui la traverse. Cela nécessite d'avoir l'angle sur chaque pixel

3. On associe tous les points traversés à la même instance et on les supprime du masque

4. On refait tourner tant qu'il reste des pixels allumés

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