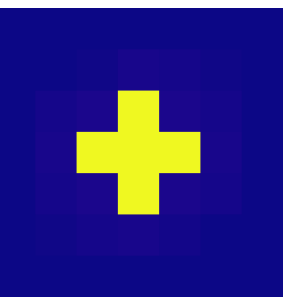
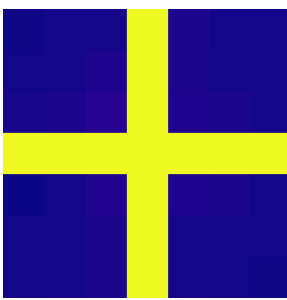


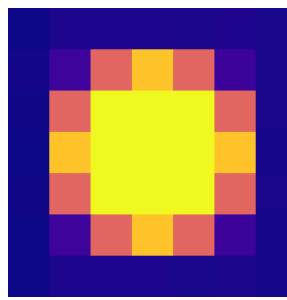
Opération : **fermeture**
Jeu : **MNIST**



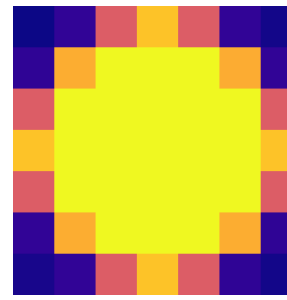
cross3



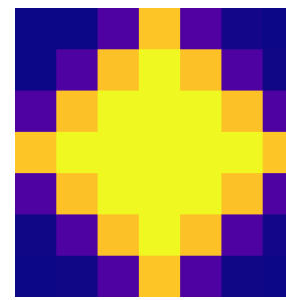
cross7



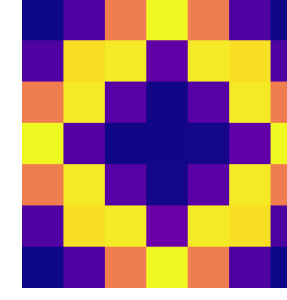
disk2



disk3



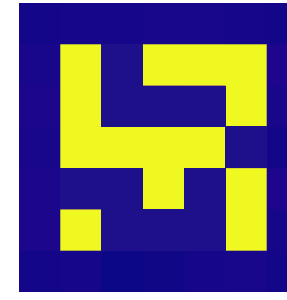
diamond3



complex



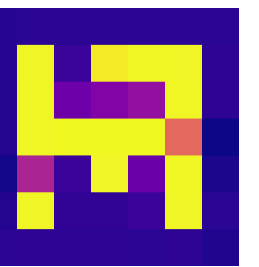
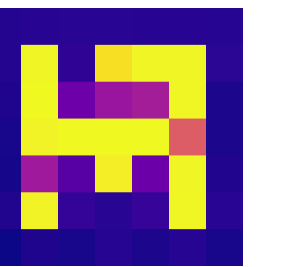
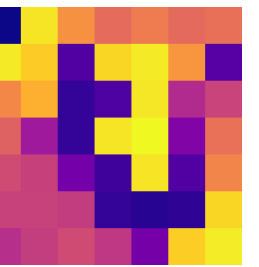
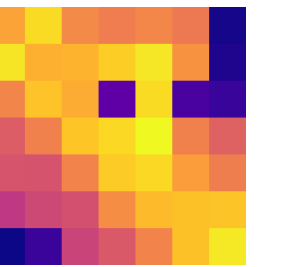
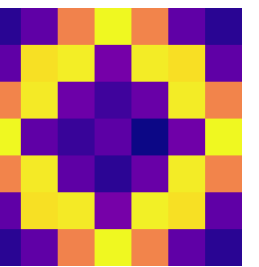
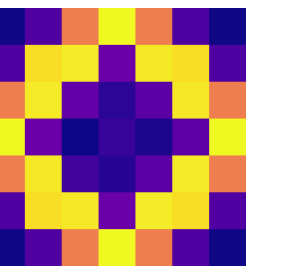
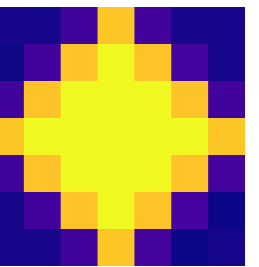
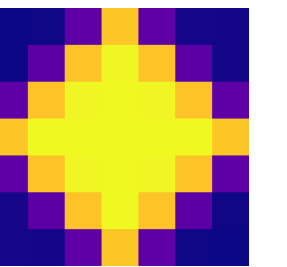
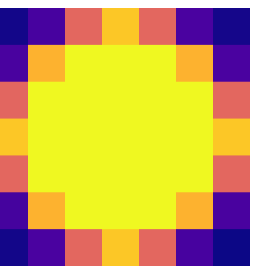
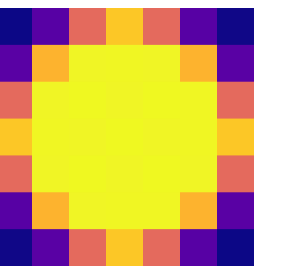
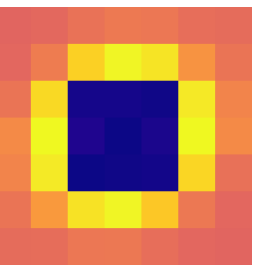
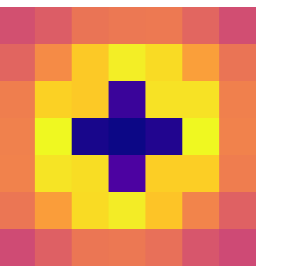
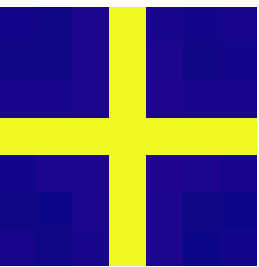
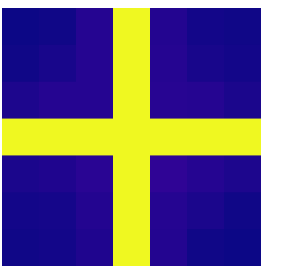
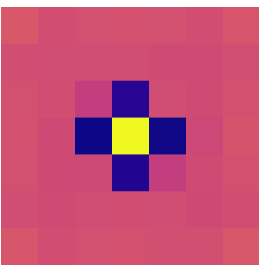
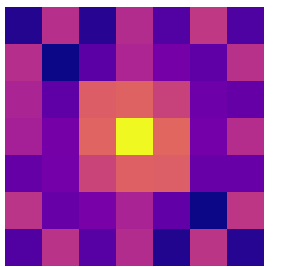
adiag



brand

Sans partage

w_1/w_2



α_1

-0.43 ± 0.001

49.82 ± 0.44

1.48 ± 0.004

49.18 ± 0.22

50.50 ± 0.44

28.70 ± 0.05

4.35 ± 6.16

37.26 ± 0.16

α_2

-5.11 ± 0.012

-49.20 ± 0.36

-1.78 ± 0.003

-47.29 ± 0.17

-50.03 ± 0.34

-40.72 ± 0.07

-3.87 ± 5.02

-25.29 ± 0.07

RMSE₁

$0.32 \pm 1 \times 10^{-3}$

$0.02 \pm 8 \times 10^{-4}$

$0.57 \pm 7 \times 10^{-4}$

$0.018 \pm 2 \times 10^{-4}$

$0.01 \pm 4 \times 10^{-4}$

$0.02 \pm 3 \times 10^{-3}$

$0.44 \pm 1 \times 10^{-1}$

$0.12 \pm 4 \times 10^{-3}$

RMSE₂

$0.57 \pm 9 \times 10^{-4}$

$0.01 \pm 3 \times 10^{-4}$

$0.65 \pm 5 \times 10^{-4}$

$0.004 \pm 4 \times 10^{-4}$

$0.01 \pm 3 \times 10^{-4}$

$0.03 \pm 9 \times 10^{-3}$

$0.43 \pm 1 \times 10^{-1}$

$0.13 \pm 3 \times 10^{-3}$

LOSS

$2.0 \times 10^{-3} \pm 4 \times 10^{-5}$

$1.5 \times 10^{-5} \pm 8 \times 10^{-6}$

$1.8 \times 10^{-3} \pm 6 \times 10^{-6}$

$1.4 \times 10^{-5} \pm 4 \times 10^{-6}$

$1.4 \times 10^{-5} \pm 4 \times 10^{-6}$

$2.5 \times 10^{-5} \pm 9 \times 10^{-6}$

$1.8 \times 10^{-3} \pm 5 \times 10^{-4}$

$3.1 \times 10^{-4} \pm 4 \times 10^{-6}$

EPOCHS

17 ± 1

32 ± 8

23 ± 4

27 ± 2

28 ± 4

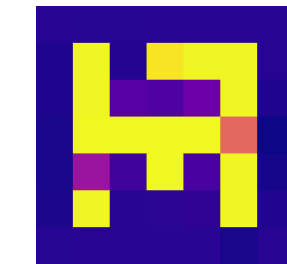
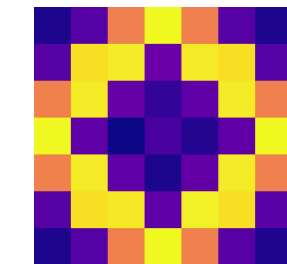
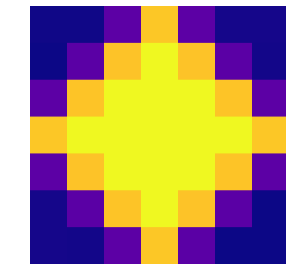
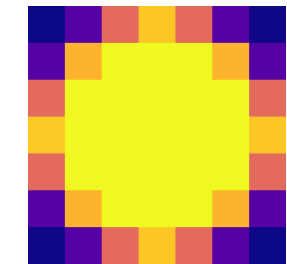
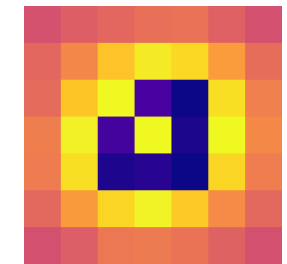
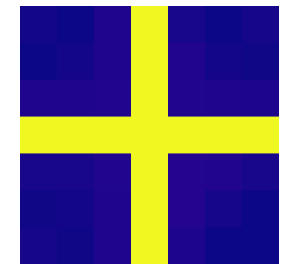
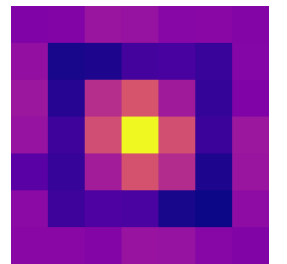
31 ± 4

27 ± 6

28 ± 3

Partage dur

w



α_1

-0.38 ± 0.001

50.62 ± 0.06

1.60 ± 0.003

56.55 ± 0.24

52.89 ± 0.05

34.80 ± 0.09

49.84 ± 0.88

44.89 ± 0.20

α_2

-0.73 ± 0.003

-49.63 ± 0.05

-1.97 ± 0.006

-50.97 ± 0.16

-51.91 ± 0.08

-45.21 ± 0.14

-19.41 ± 0.10

-34.36 ± 0.19

RMSE

$0.26 \pm 9 \times 10^{-4}$

$0.02 \pm 8 \times 10^{-3}$

$0.61 \pm 2 \times 10^{-4}$

$0.02 \pm 1 \times 10^{-4}$

$0.02 \pm 9 \times 10^{-5}$

$0.03 \pm 8 \times 10^{-3}$

$0.16 \pm 2 \times 10^{-3}$

$0.11 \pm 3 \times 10^{-3}$

LOSS

$3.2 \times 10^{-3} \pm 6 \times 10^{-5}$

$1.2 \times 10^{-5} \pm 1 \times 10^{-6}$

$1.5 \times 10^{-3} \pm 8 \times 10^{-6}$

$1.2 \times 10^{-5} \pm 1 \times 10^{-6}$

$1.3 \times 10^{-5} \pm 1 \times 10^{-6}$

$2.1 \times 10^{-5} \pm 3 \times 10^{-6}$

$7.3 \times 10^{-4} \pm 7 \times 10^{-6}$

$3.2 \times 10^{-4} \pm 4 \times 10^{-6}$

EPOCHS

42 ± 9

33 ± 5

22 ± 3

31 ± 5

36 ± 7

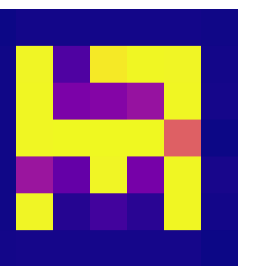
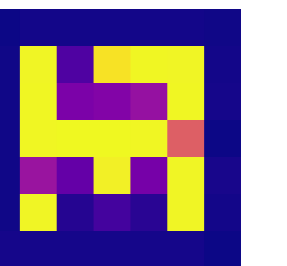
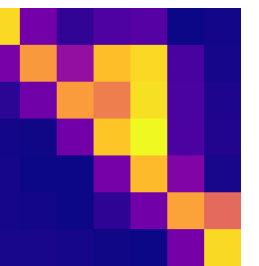
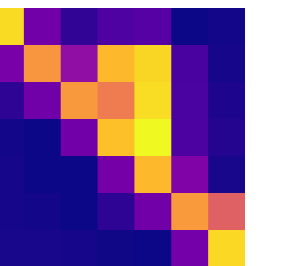
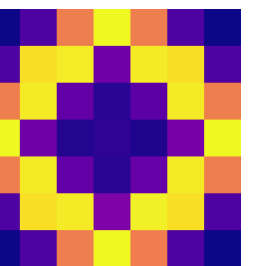
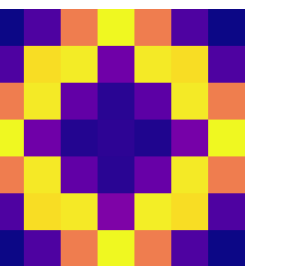
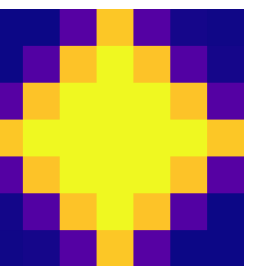
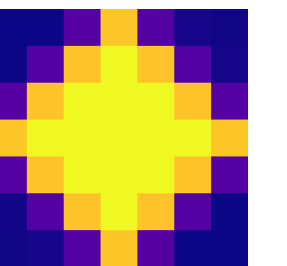
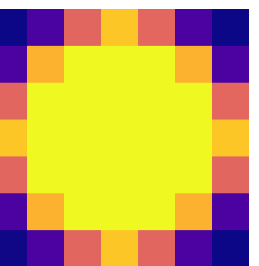
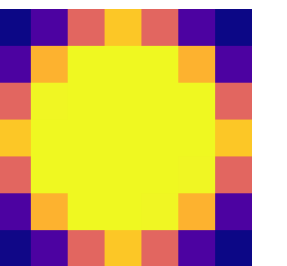
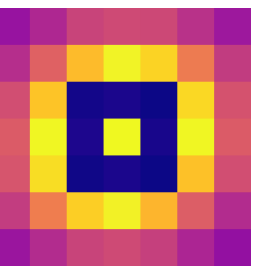
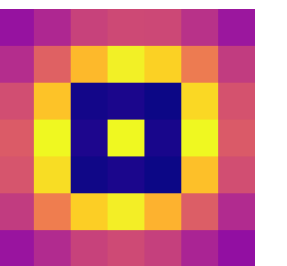
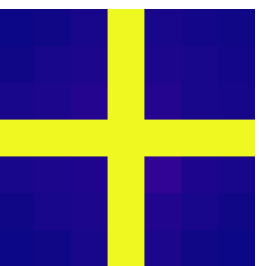
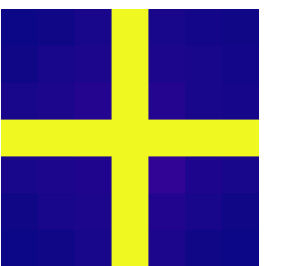
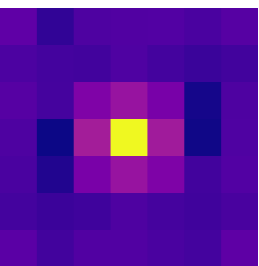
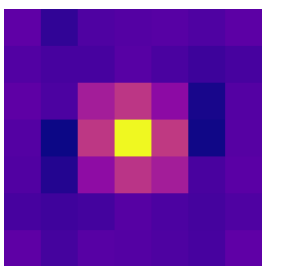
26 ± 2

33 ± 5

30 ± 5

Partage doux

w_1/w_2



α_1

-0.42 ± 0.001

50.25 ± 0.06

1.51 ± 0.05

54.82 ± 0.23

52.21 ± 0.22

29.24 ± 0.06

39.68 ± 7.81

38.01 ± 0.06

α_2

-5.73 ± 0.014

-49.46 ± 0.05

-1.91 ± 0.09

-49.41 ± 0.15

-50.90 ± 0.22

-40.95 ± 0.08

-17.53 ± 0.08

-28.65 ± 0.09

RMSE₁

$0.22 \pm 7 \times 10^{-4}$

$0.02 \pm 8 \times 10^{-4}$

$0.56 \pm 2 \times 10^{-2}$

$0.005 \pm 2 \times 10^{-4}$

$0.007 \pm 2 \times 10^{-4}$

$0.03 \pm 2 \times 10^{-3}$

$0.07 \pm 8 \times 10^{-3}$

$0.13 \pm 8 \times 10^{-4}$

RMSE₂

$0.23 \pm 1 \times 10^{-3}$

$0.02 \pm 7 \times 10^{-4}$

$0.56 \pm 2 \times 10^{-2}$

$0.005 \pm 2 \times 10^{-4}$

$0.007 \pm 4 \times 10^{-4}$

$0.03 \pm 2 \times 10^{-3}$

$0.08 \pm 8 \times 10^{-3}$

$0.13 \pm 7 \times 10^{-4}$

LOSS

$2.1 \times 10^{-3} \pm 2 \times 10^{-5}$

$1.1 \times 10^{-5} \pm 2 \times 10^{-6}$

$1.8 \times 10^{-3} \pm 9 \times 10^{-5}$

$1.4 \times 10^{-5} \pm 3 \times 10^{-6}$

$1.4 \times 10^{-5} \pm 6 \times 10^{-6}$

$2.2 \times 10^{-5} \pm 3 \times 10^{-6}$

$5.2 \times 10^{-4} \pm 1 \times 10^{-5}$

$3.2 \times 10^{-4} \pm 3 \times 10^{-6}$

EPOCHS

30 ± 8

34 ± 7

19 ± 6

33 ± 11

29 ± 4

30 ± 5

34 ± 5

32 ± 4