Attaque de réseau en boîte noire

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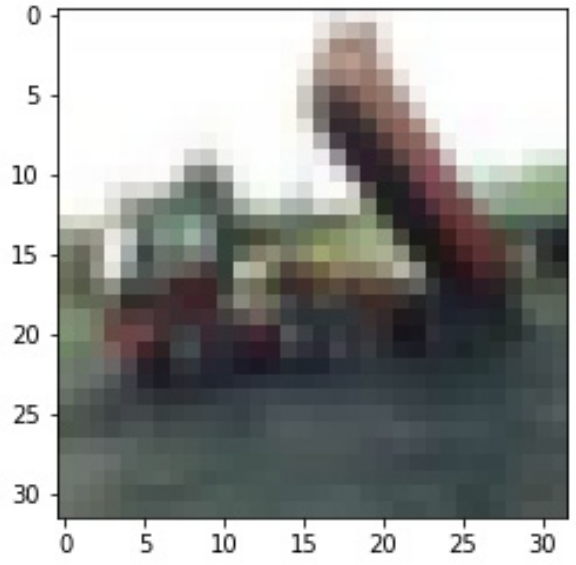
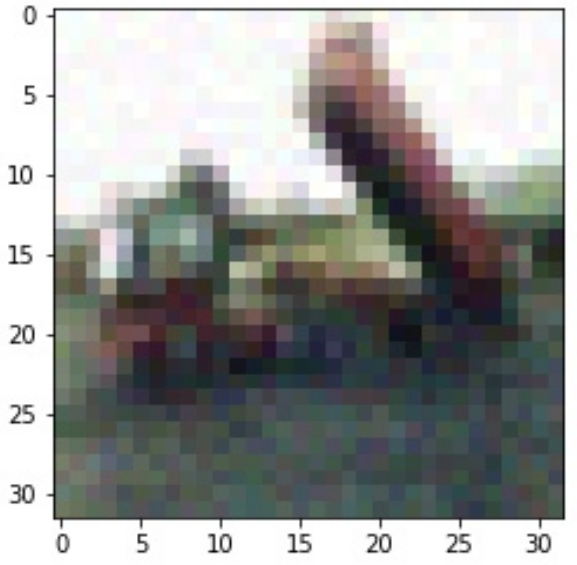
18 décembre 2019

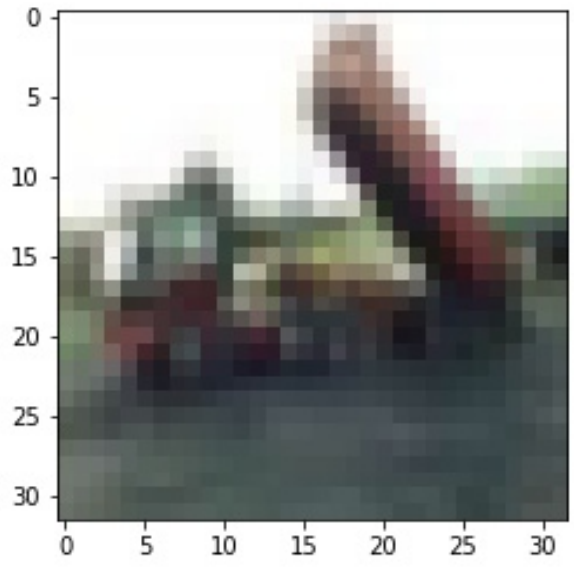




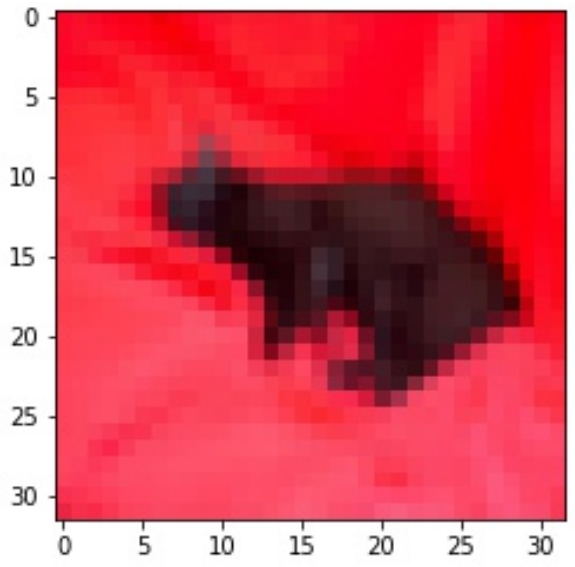
0.07 0.07 0.08 0.02 0.00
0.04 0.01 0.03 0.14 0.54

0.29 0.04 0.12 0.03 0.00
0.02 0.00 0.03 0.26 0.19

$(\epsilon = .03)$



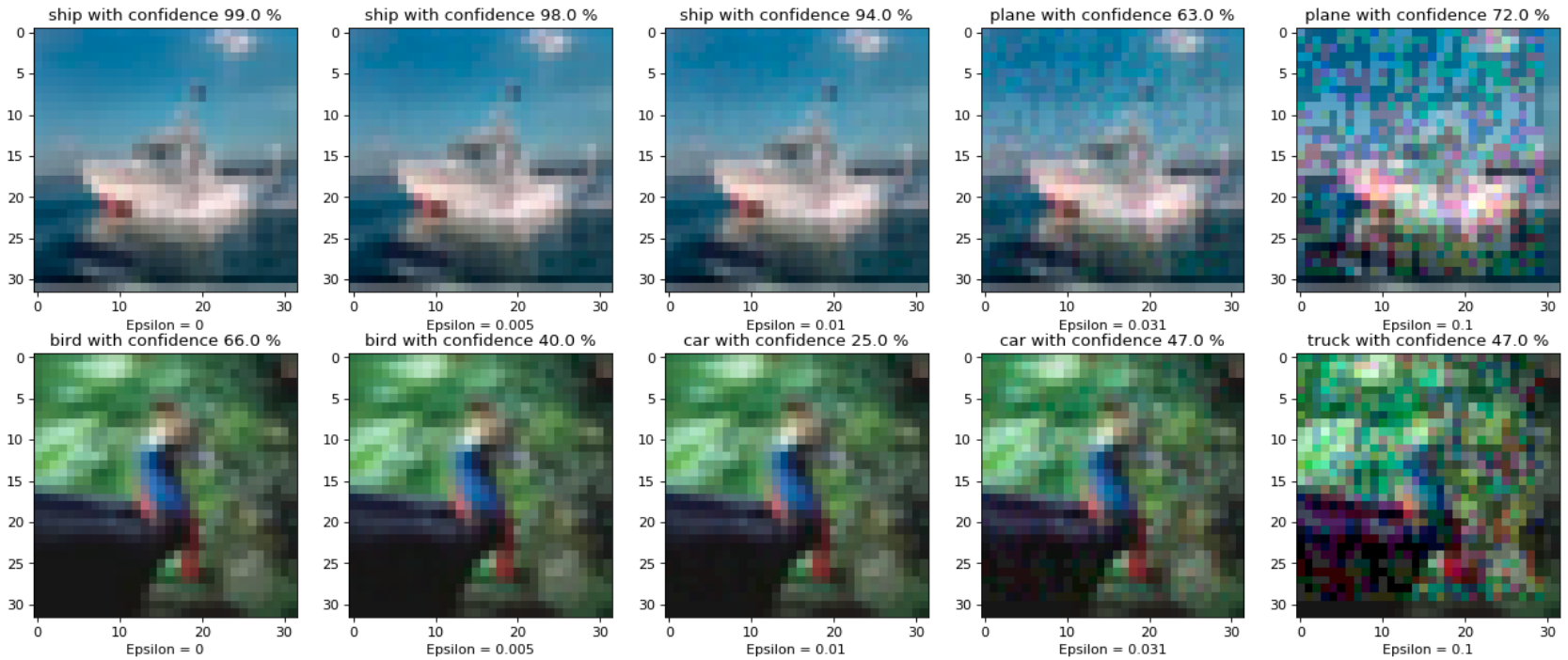
0.07 0.07 0.08 0.02 0.00
0.04 0.01 0.03 0.14 0.54



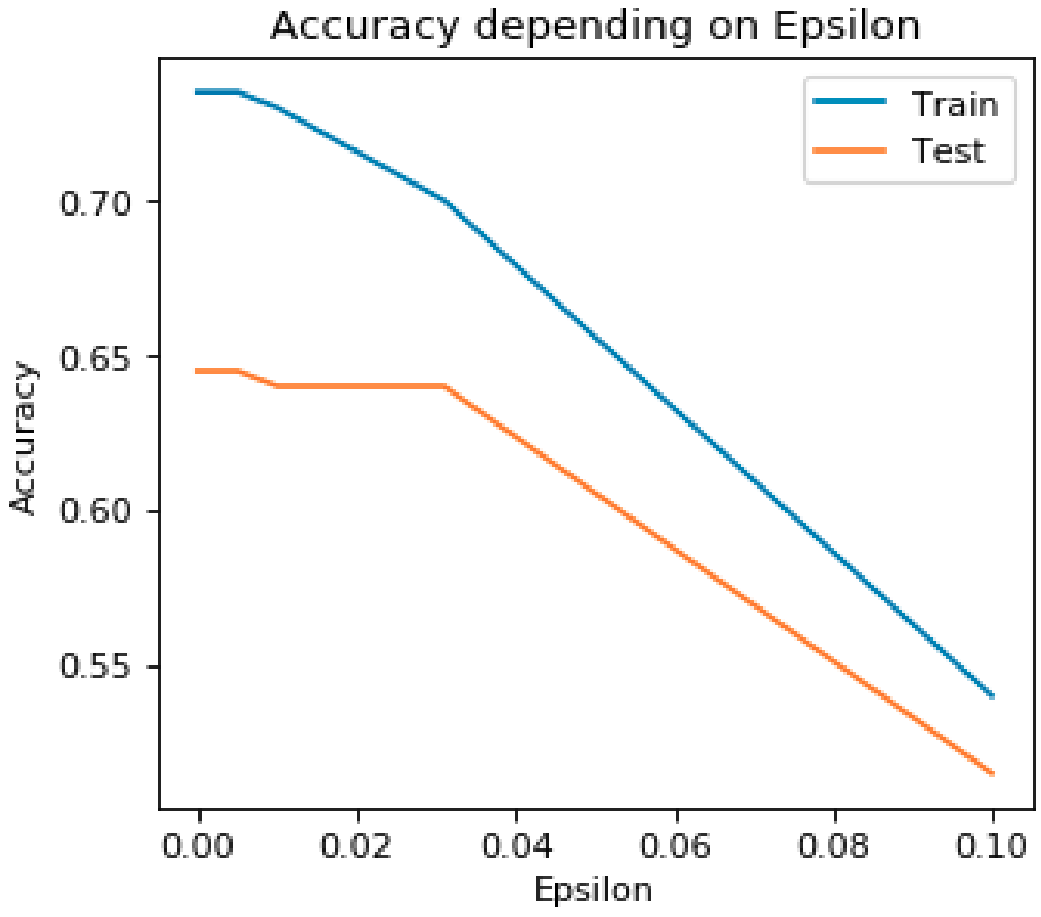
0.82 0.00 0.00 0.16 0.00
0.01 0.01 0.00 0.00 0.00

Principe

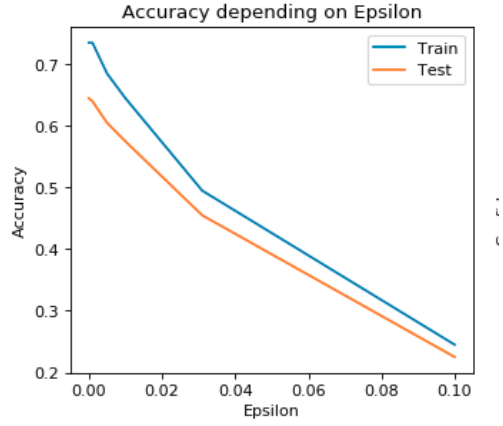
$$\text{image perturbée} = \text{image} + \epsilon \times \text{sign}(\text{gradient})$$

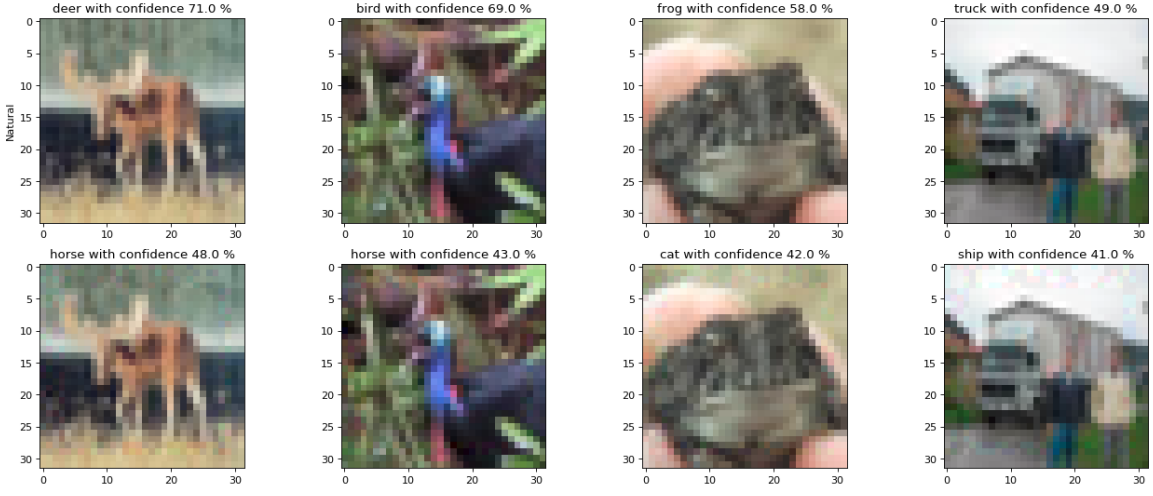


Précision et exemples avec des attaques aléatoires

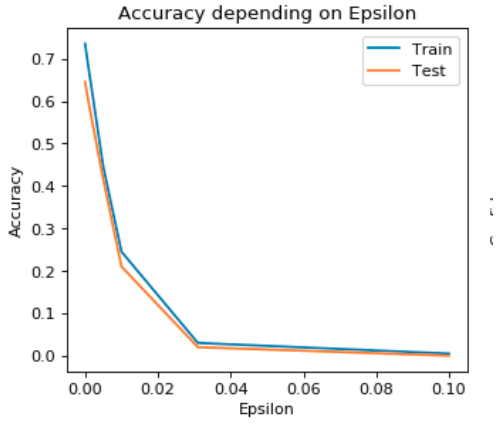


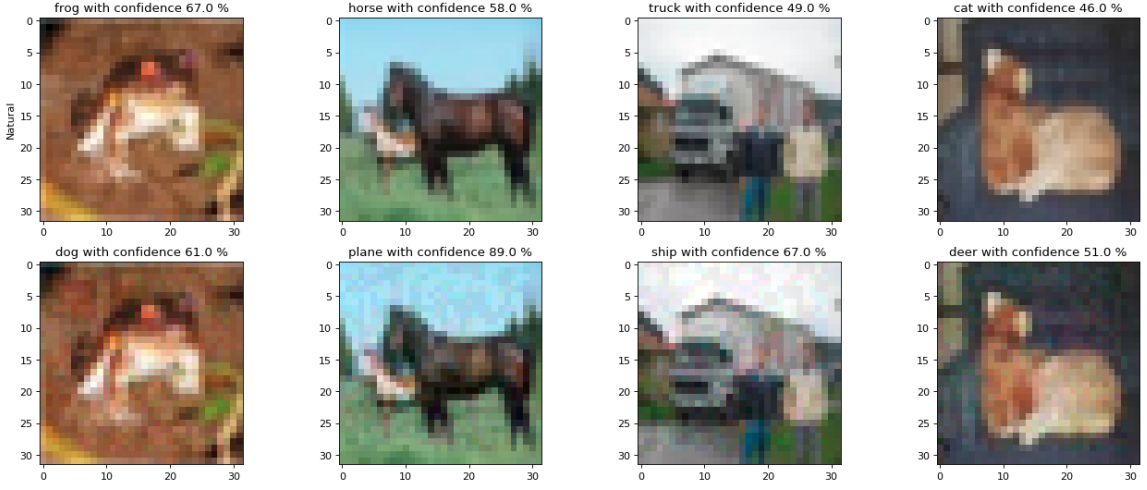
Précision et exemples avec des attaques FGSM partielles



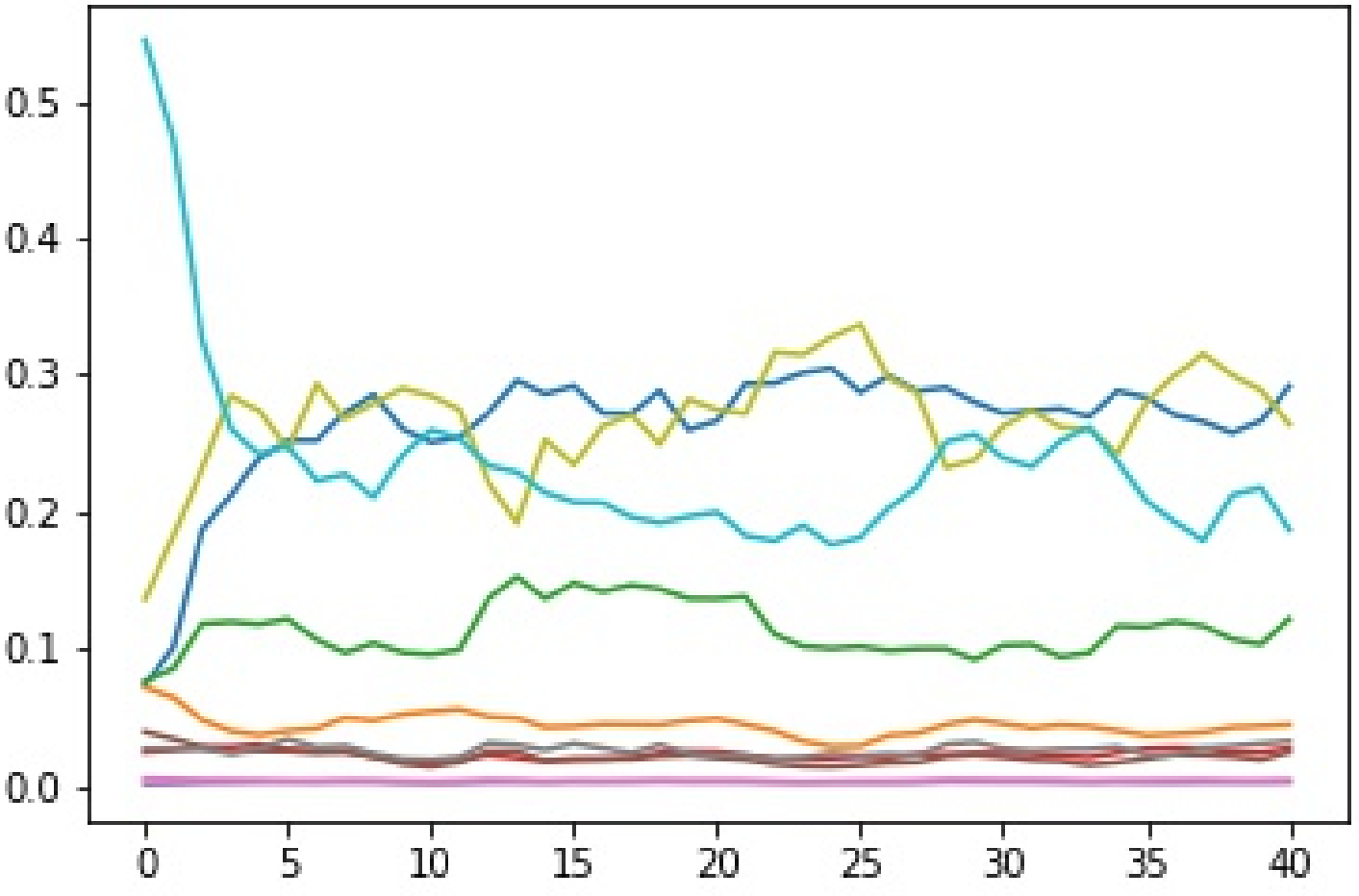


Précision et exemples avec des attaques FGSM totales

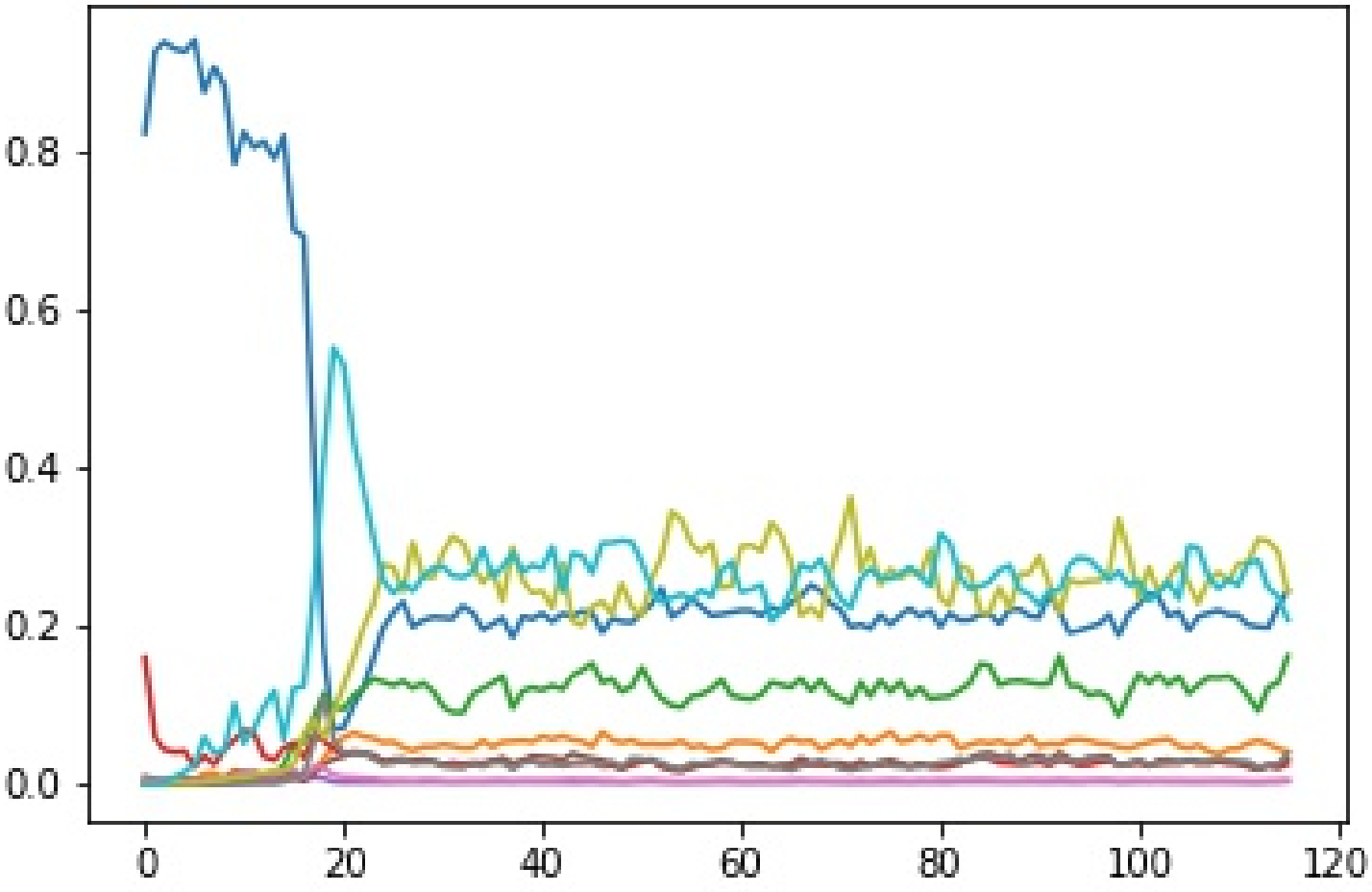




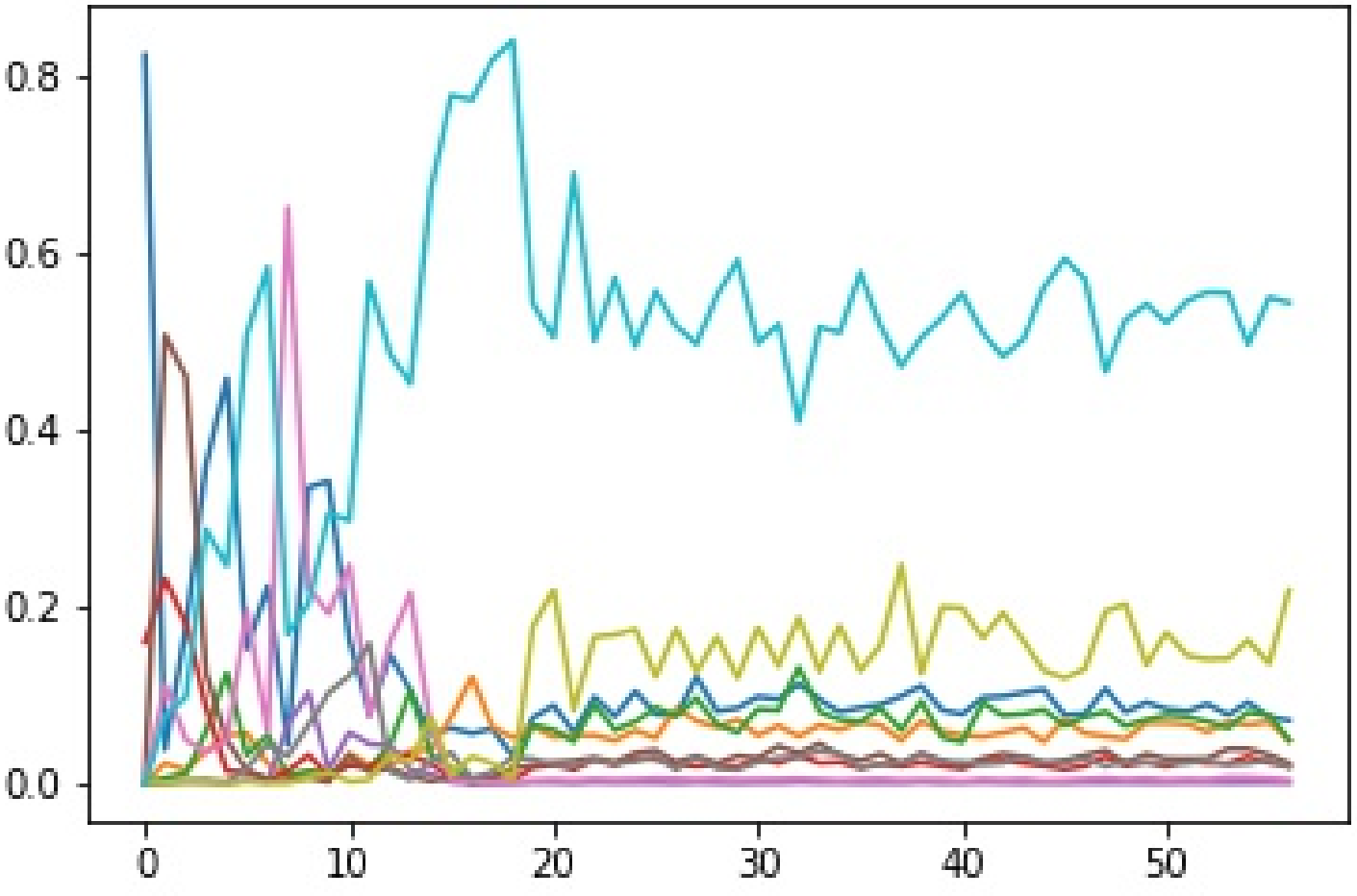
Information totale



Information limitée aux scores du top k ($k = 5$)

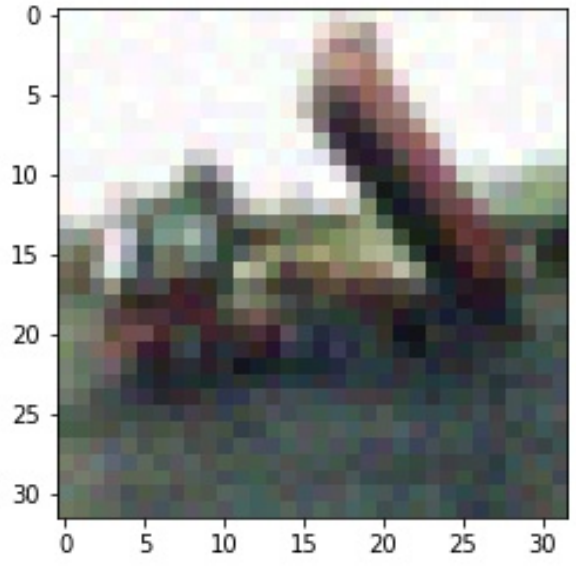


Information limitée aux rangs du top k ($k = 5$)



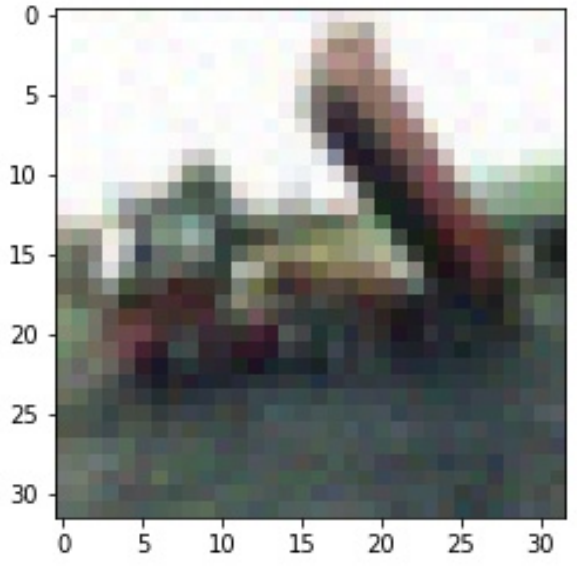
Comparaison avec la norme l_2

Norme l_∞, $\epsilon = .03$



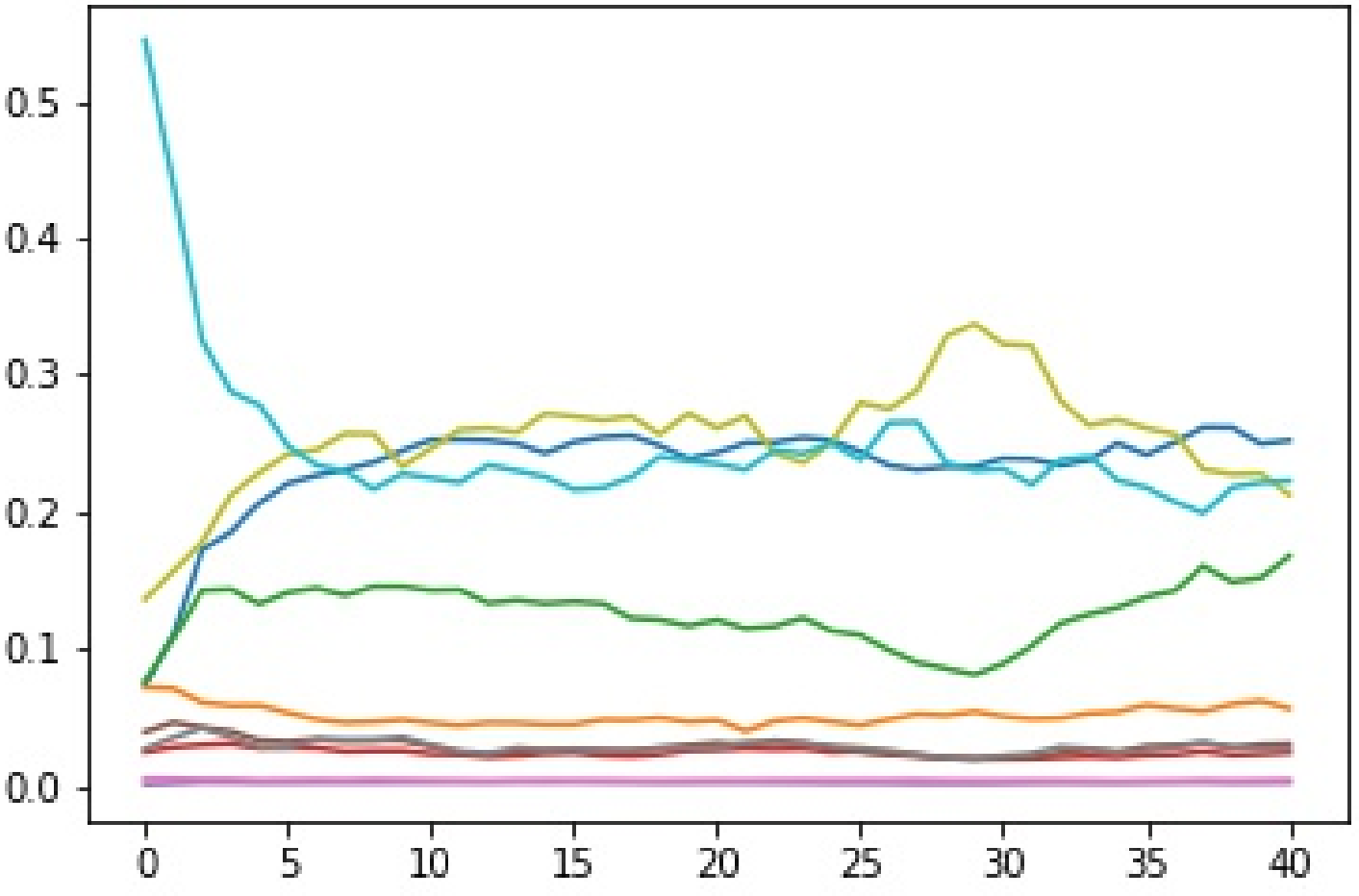
0.29 0.04 0.12 0.03 0.00
0.02 0.00 0.03 0.26 0.19

Norme l_2, $\epsilon = 1$



0.25 0.06 0.17 0.02 0.00
0.03 0.00 0.03 0.21 0.22

Pour la norme L2



Une meilleure norme ?

$$||x - y|| \rightarrow ||\text{grad}(x) - \text{grad}(y)||$$

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Ordre de grandeur :

$$||\text{grad}(x) - \text{grad}(y)||_\infty \leq .02$$

$$||x - y||_\infty \leq .1$$

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Ordre de grandeur :

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$$||x - y||_\infty \leq .1$$

Projection ?