



Face Swap

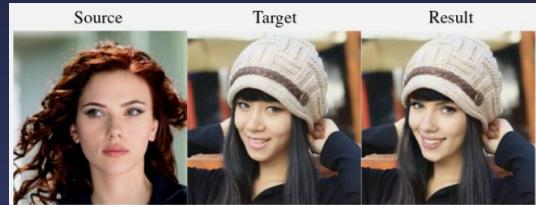
CONDE SALAZAR Arthur
BONETTI Timothée

Objectifs du projet

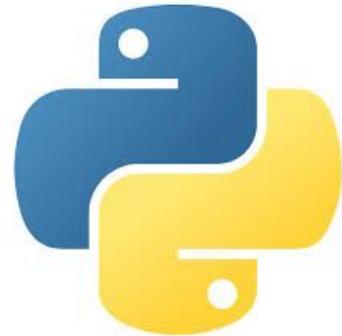
- Explorer les méthodes d'apprentissage profond sur des images de visages.
- Tester les méthodes sur un dataset personnel des élèves de la classe.
- Réussir à échanger les visages de deux images.
- Mesurer la qualité des résultats.

Etat de l'art

- Fast Face-swap Using Convolutional Neural Networks Korshunova, I., Shi, W., Dambre, J., & Theis, L. (2017)
- FSGAN : Subject Agnostic Face Swapping and Reenactment. Nirkin, Y., Keller, Y., & Hassner, T. (2019)
- FaceShifter : Towards High Fidelity And Occlusion Aware Face Swapping. Li, L., Bao, J., Yang, H., Chen, D., & Wen, F. (2021)
- DiffSwap: High-Fidelity and Controllable Face Swapping via 3D-Aware Masked Diffusion (2025)



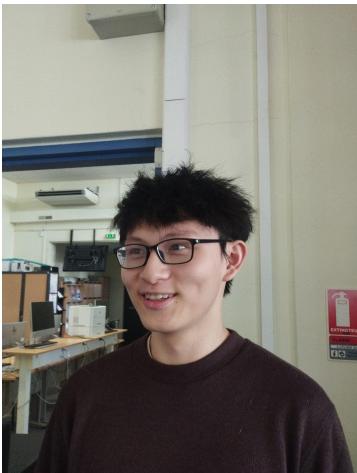
■ Technologies utilisées



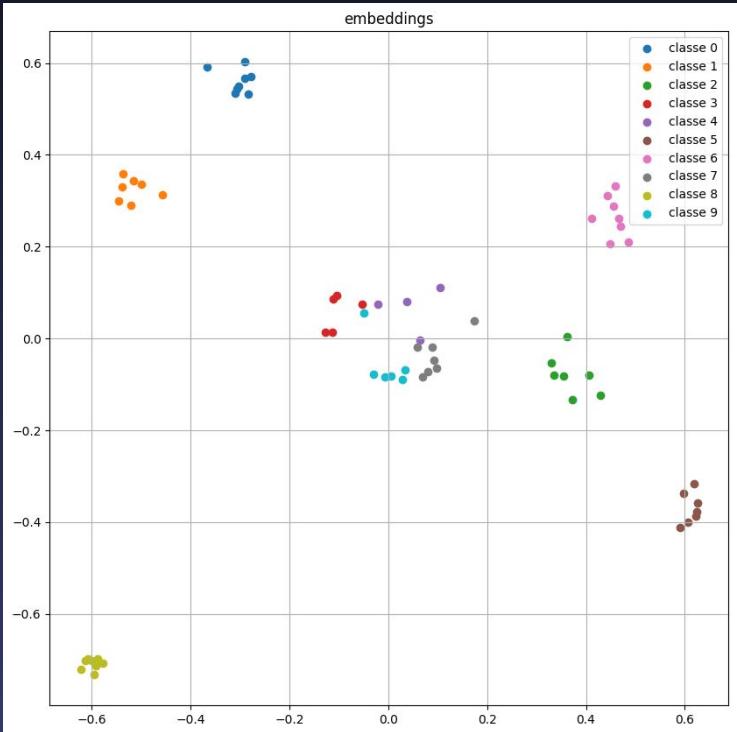
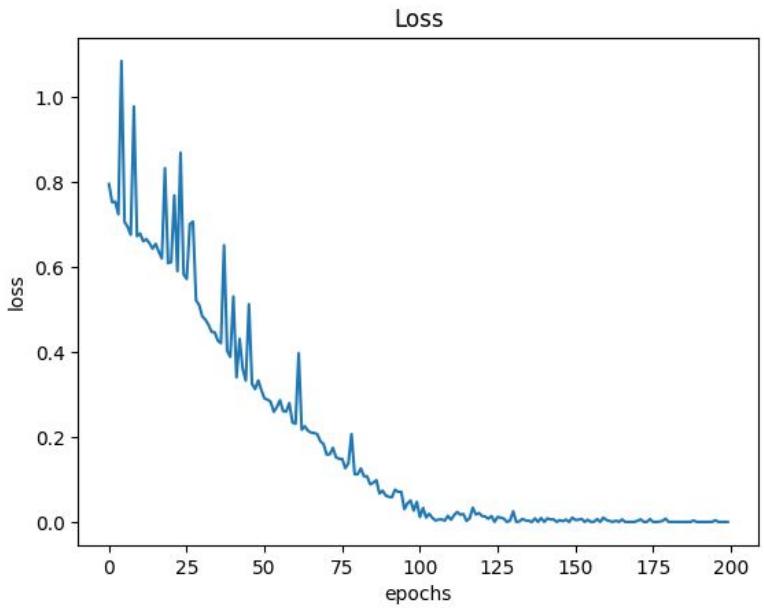


Dataset personnel et classification.

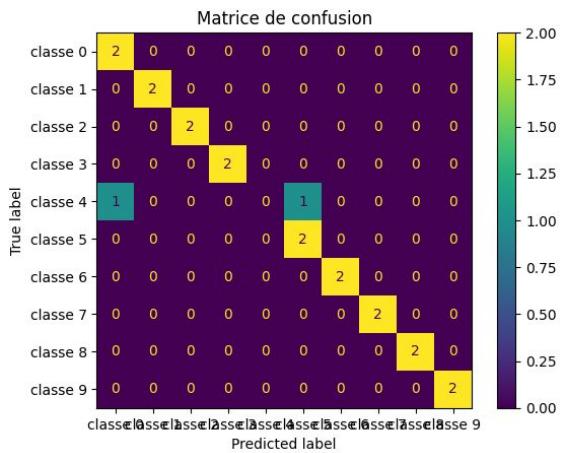
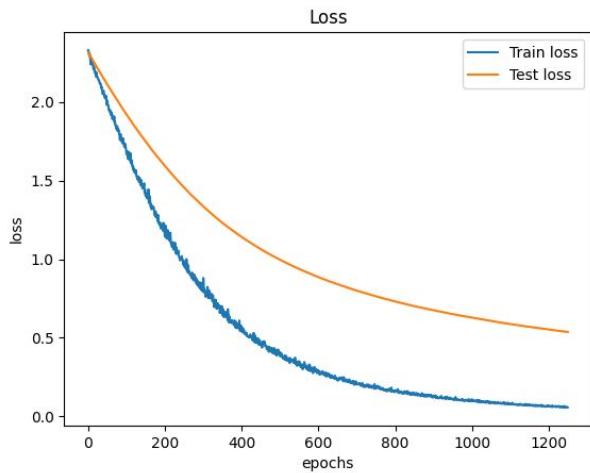
Dataset Personnel



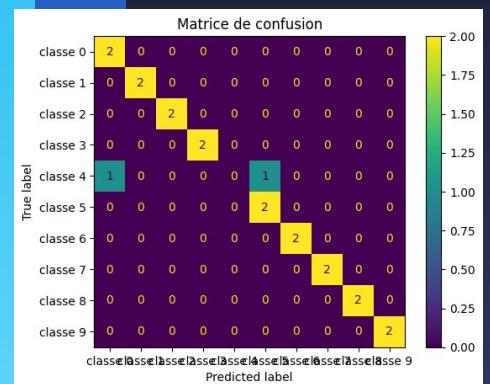
Encodeur



Classification



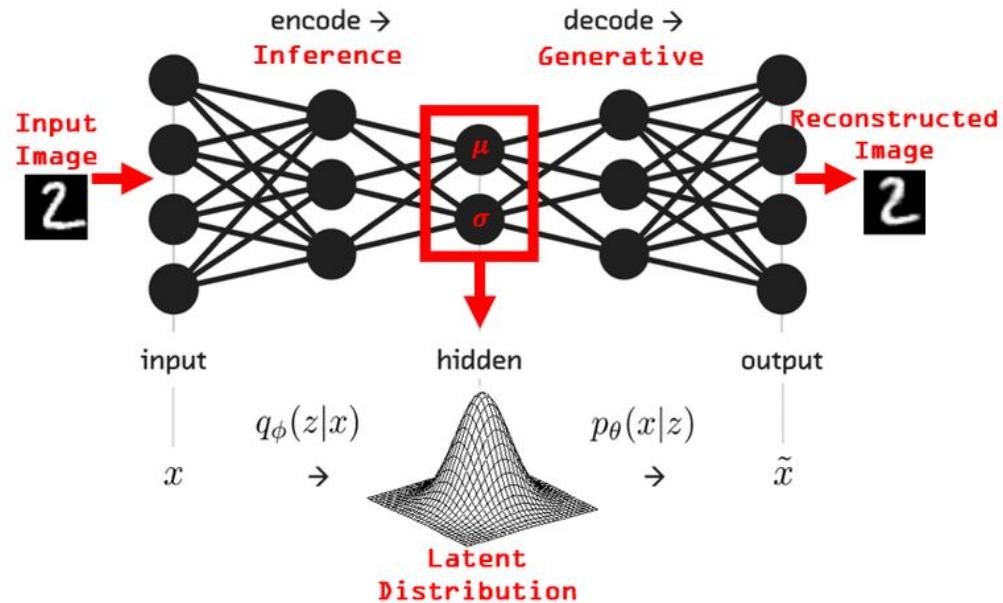
Classification





Test avec un
VAE

C'est quoi un VAE ?



VAE entraîné sur notre dataset.

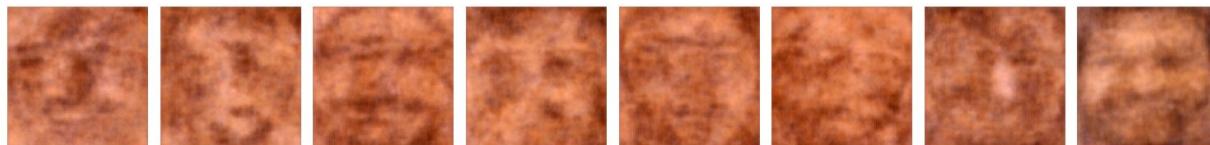


ELBO loss

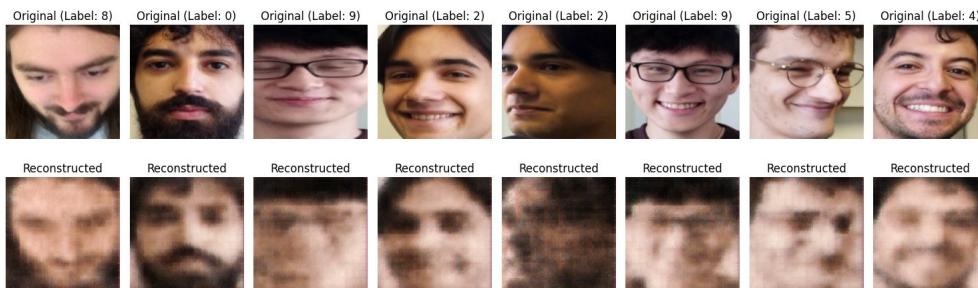


Tests sur le VAE

- Manipuler les vecteurs latents



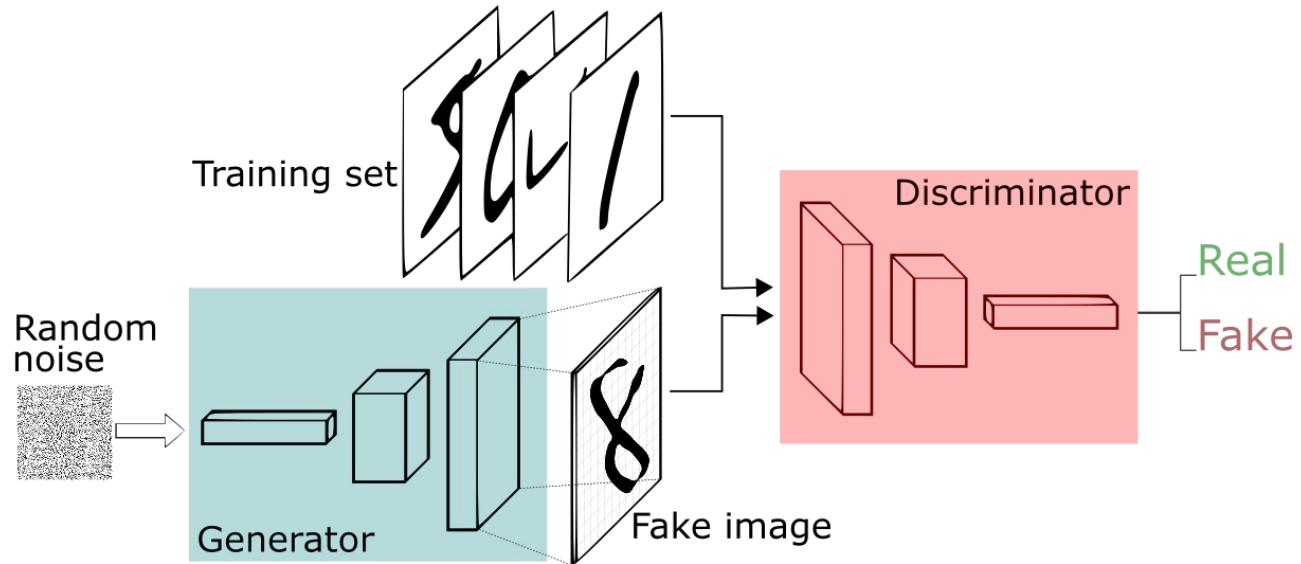
- Hyper loop (moins bons résultats)



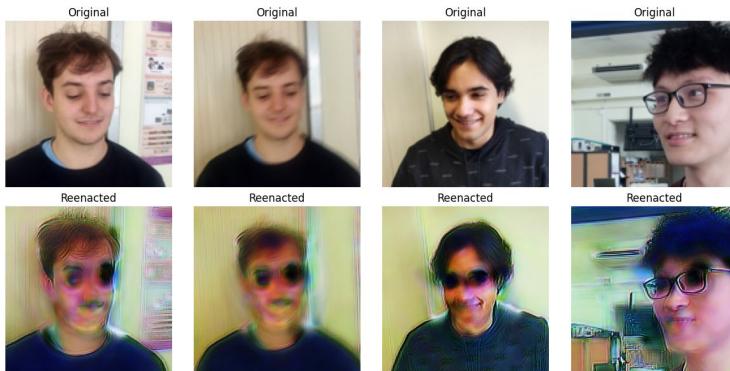
A vertical strip on the left side of the slide shows a dense forest with tall evergreen trees. A small stream flows over rocks in the foreground.

GAN personnel

C'est quoi un GAN ?



Ce qu'on a essayé



Ce qu'on a essayé

Original

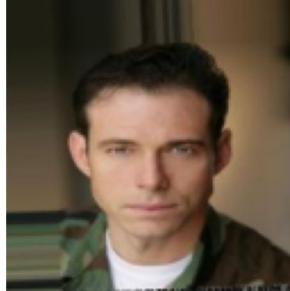


As Andrew



As Andrew

Original



As Andrew

Original



As Andrew

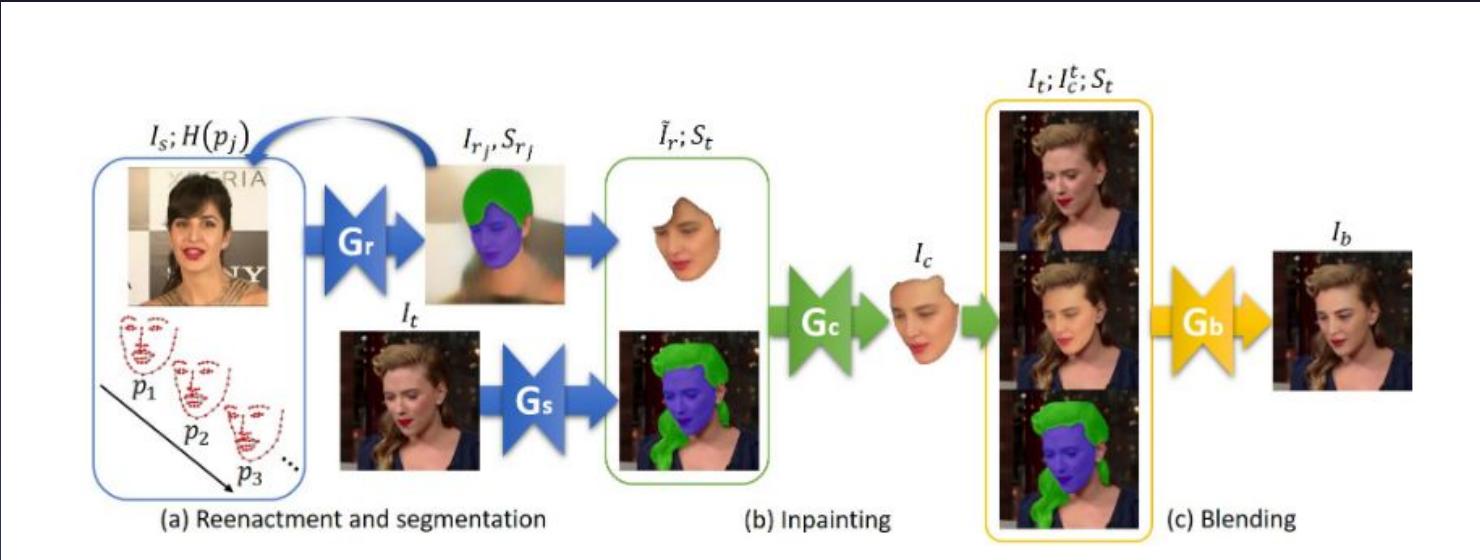
Conclusion sur notre GAN “maison”

- Mauvais résultats.
- Tres long a entrainer.
- “CUDA out of memory”.
- Peu de datasets de visages disponibles.
- Mémoire limitée sur les sessions de la fac.

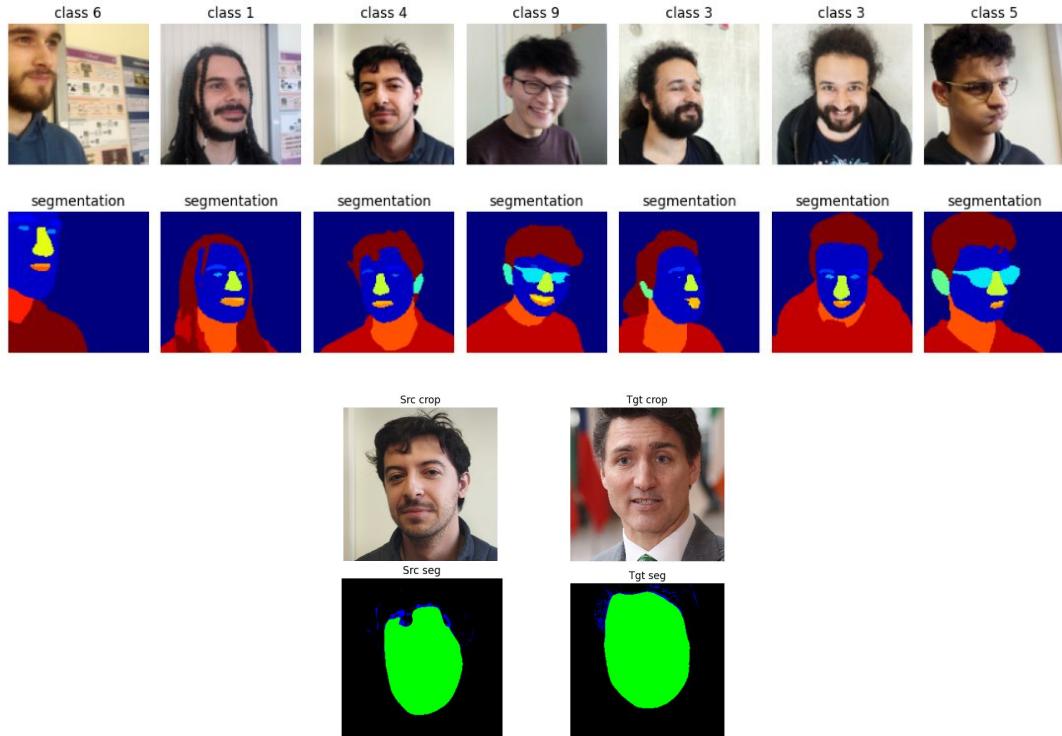
Solution : Utiliser un modèle pré entrainer et le spécialiser



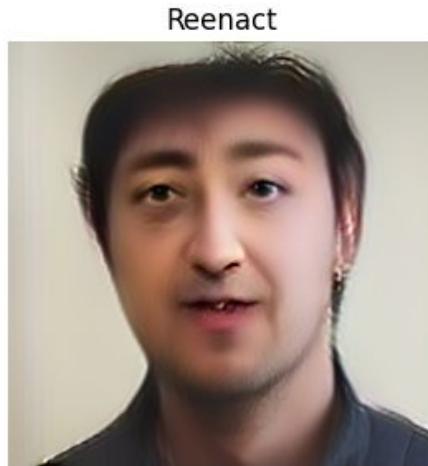
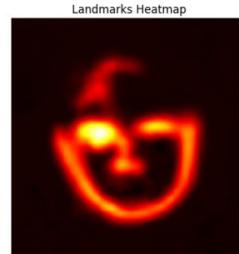
FACE SWAPPING GAN



Segmentation



Reenactment



Inpainting

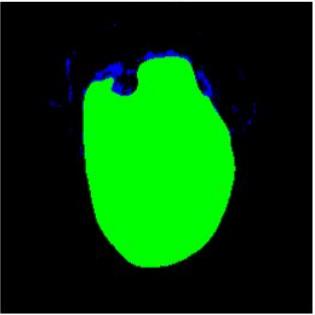
Src crop



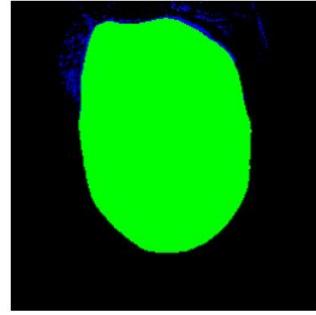
Tgt crop



Src seg



Tgt seg



Completion

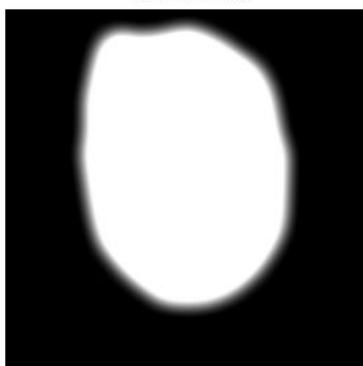


Blending

Transfer



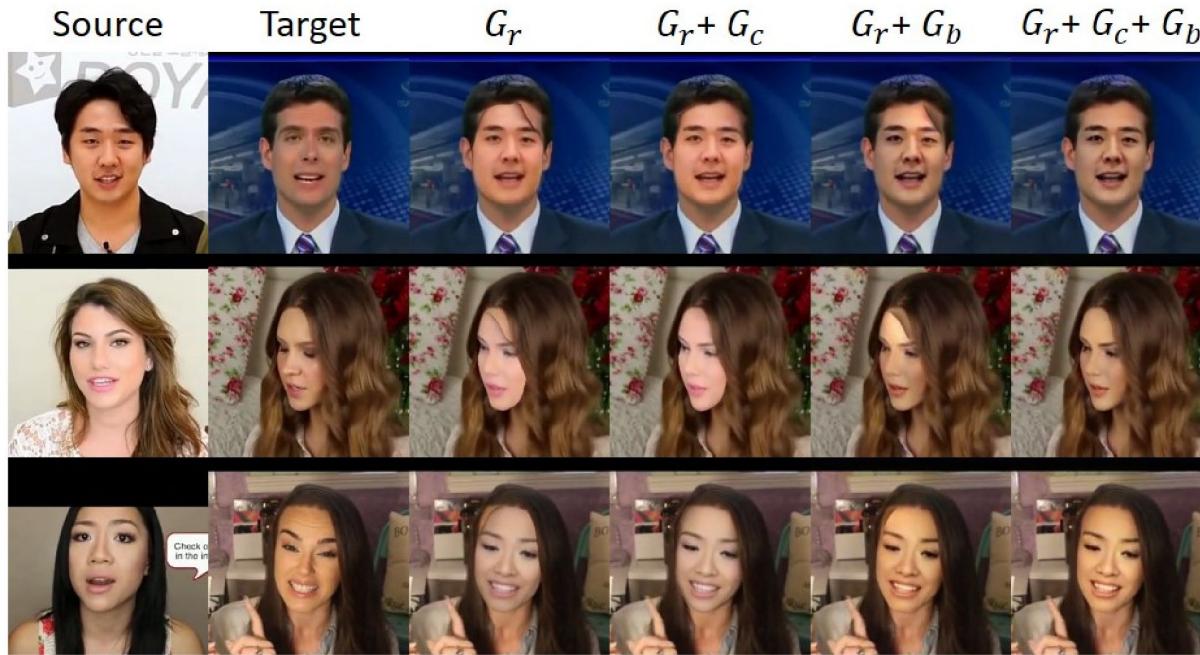
Soft mask



Blend out



Resultats attendus

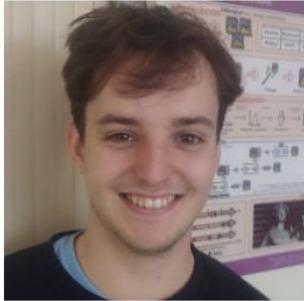


Resultats sur nos images



Resultats sur nos images

Src crop



Reenact



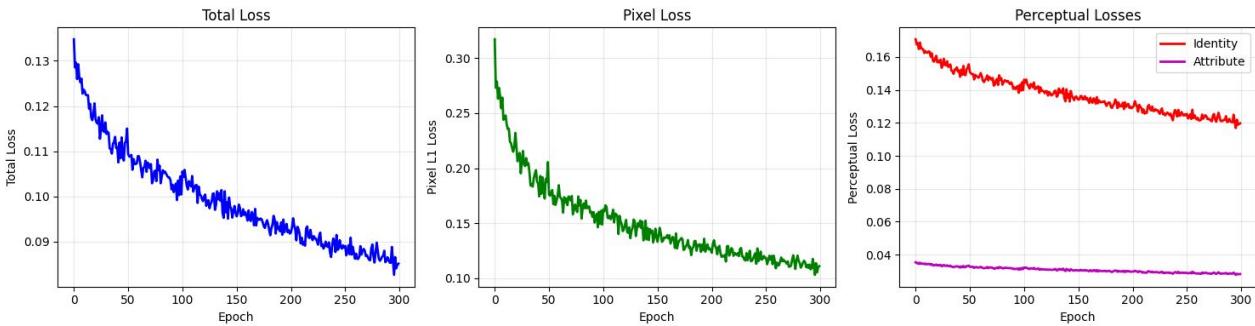
Tgt crop



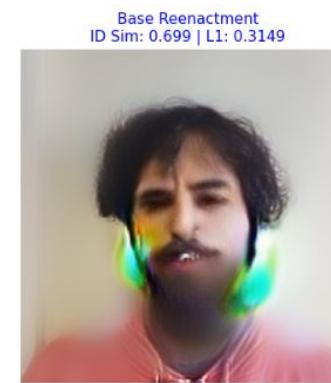
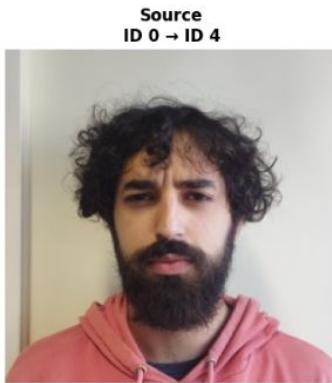
A vertical strip on the left side of the slide shows a dense forest with tall evergreen trees. A small stream flows over rocks in the foreground.

Fine Tuning

Fine Tuning modèle de recalage



Reenactment fine tuned

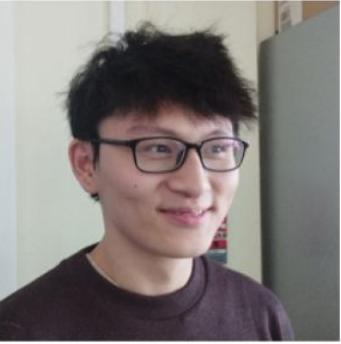


Reenactment fine tuned

Source
ID 5 → ID 9



Target
ID 5 → ID 9



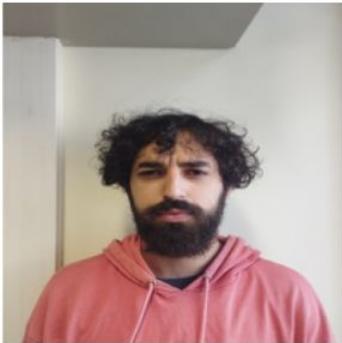
Base Reenactment
ID Sim: 0.148 | L1: 0.4891



Finetuned Reenactment
ID Sim: 0.606 ($\Delta+0.458$) | L1: 0.4214



Source
ID 0 → ID 4



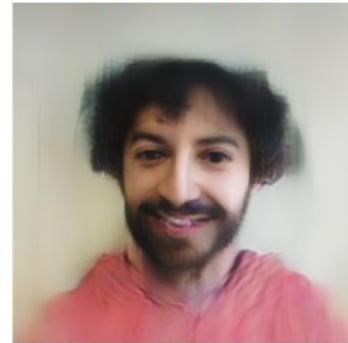
Target
ID 0 → ID 4



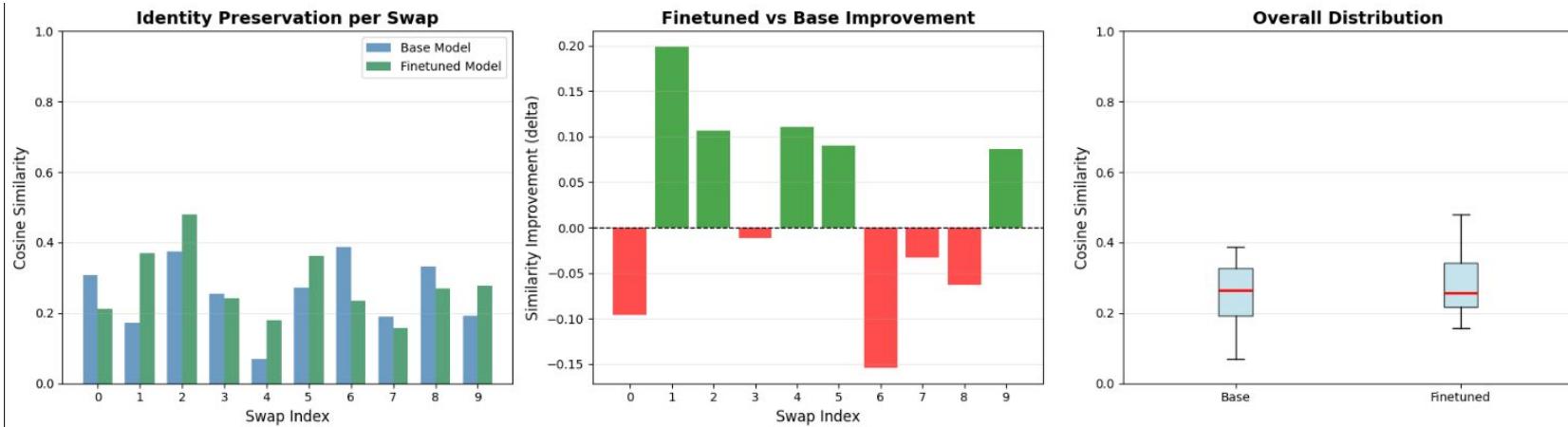
Base Reenactment
ID Sim: 0.275 | L1: 0.4766



Finetuned Reenactment
ID Sim: 0.129 ($\Delta-0.146$) | L1: 0.3592



Metrique d'évaluation



Fine Tuning modèle de recalage

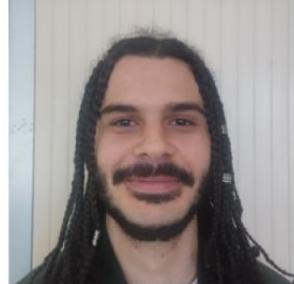
Source
ID 0



Target
Pose 5



Source
ID 1



Target
Pose 4



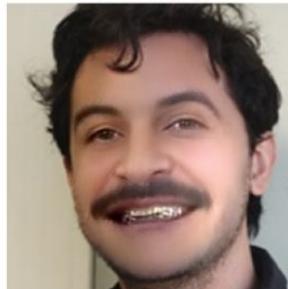
Base Model
ID 0 → Pose 5
Similarity: 0.092



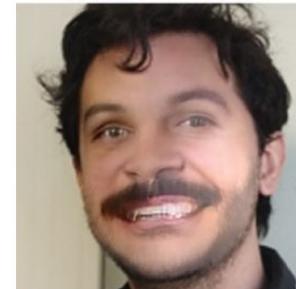
Finetuned Model
ID 0 → Pose 5
Similarity: 0.096 ($\Delta+0.004$)



Base Model
ID 1 → Pose 4
Similarity: 0.374



Finetuned Model
ID 1 → Pose 4
Similarity: 0.480 ($\Delta+0.106$)



A vertical photograph of a forest stream flowing over rocks. The water is clear and shallow, cascading down a rocky path. The surrounding forest is dense with tall, thin trees, their trunks and branches creating a complex pattern against a bright sky.

résultats

- Bons résultats



Résultats plus discutables



Perspectives

- Utiliser une architecture plus moderne
FSGAN date de 2019.
- Il nous aurait fallu plus de puissance de calcul.
- Utiliser un plus grand dataset personnalisé.
- FSGAN propose de faire de la vidéo.



merci de votre
attention