

Neural Style Transfer: Visual art with deep learning

Background

ZIND!

AI Art

Use AI to create an original piece of artwork and music to win a free trip to AI Expo in Cape

Town

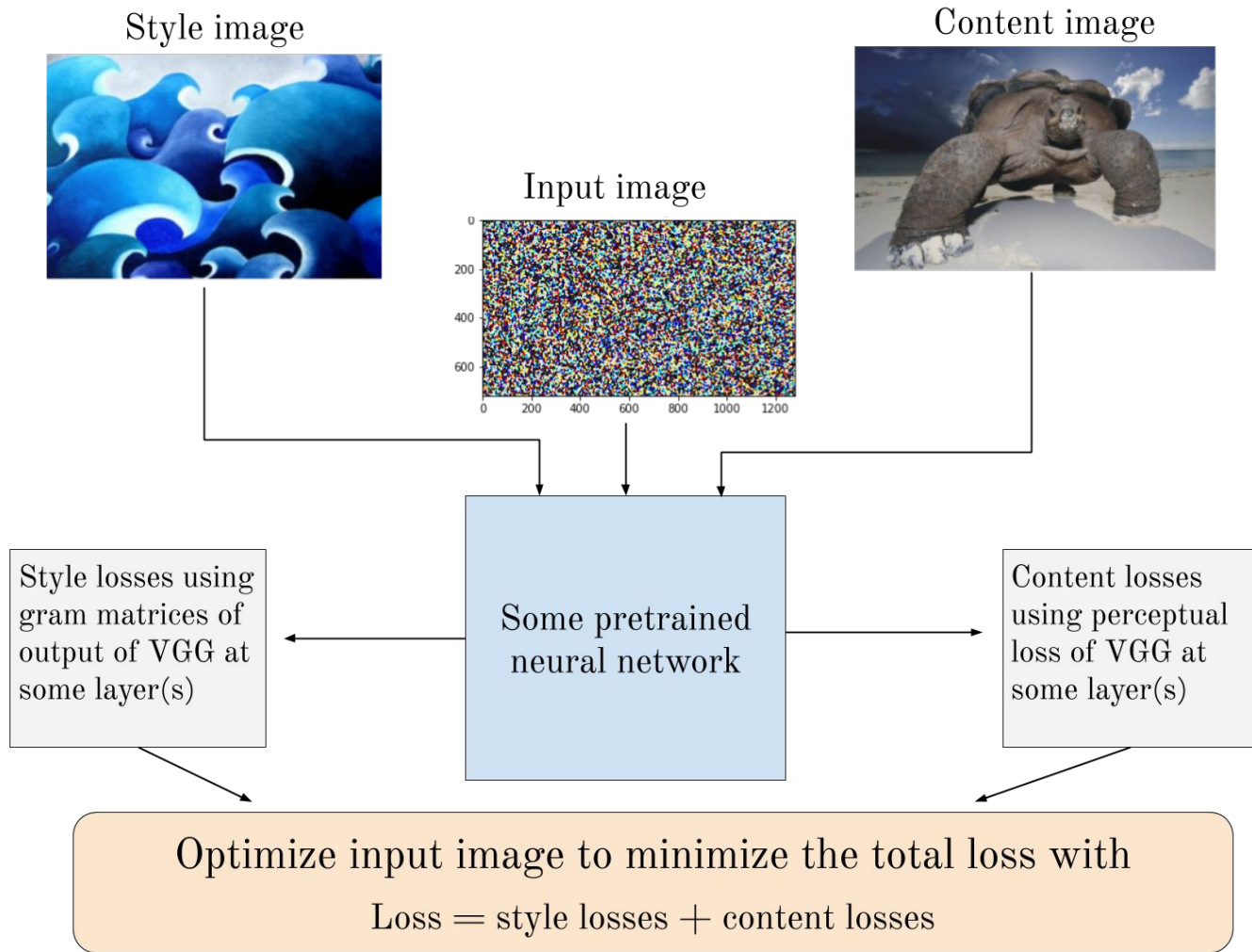


TL;DR: Neural style transfer



- Image from Pytorch neural style transfer tutorial.

The basic setup



Idea: swap this order around

+ other tweaks

Use stylistic painting as *content* image



Use photograph as *style* image



Problem: latches onto style of particular photograph

Solution?

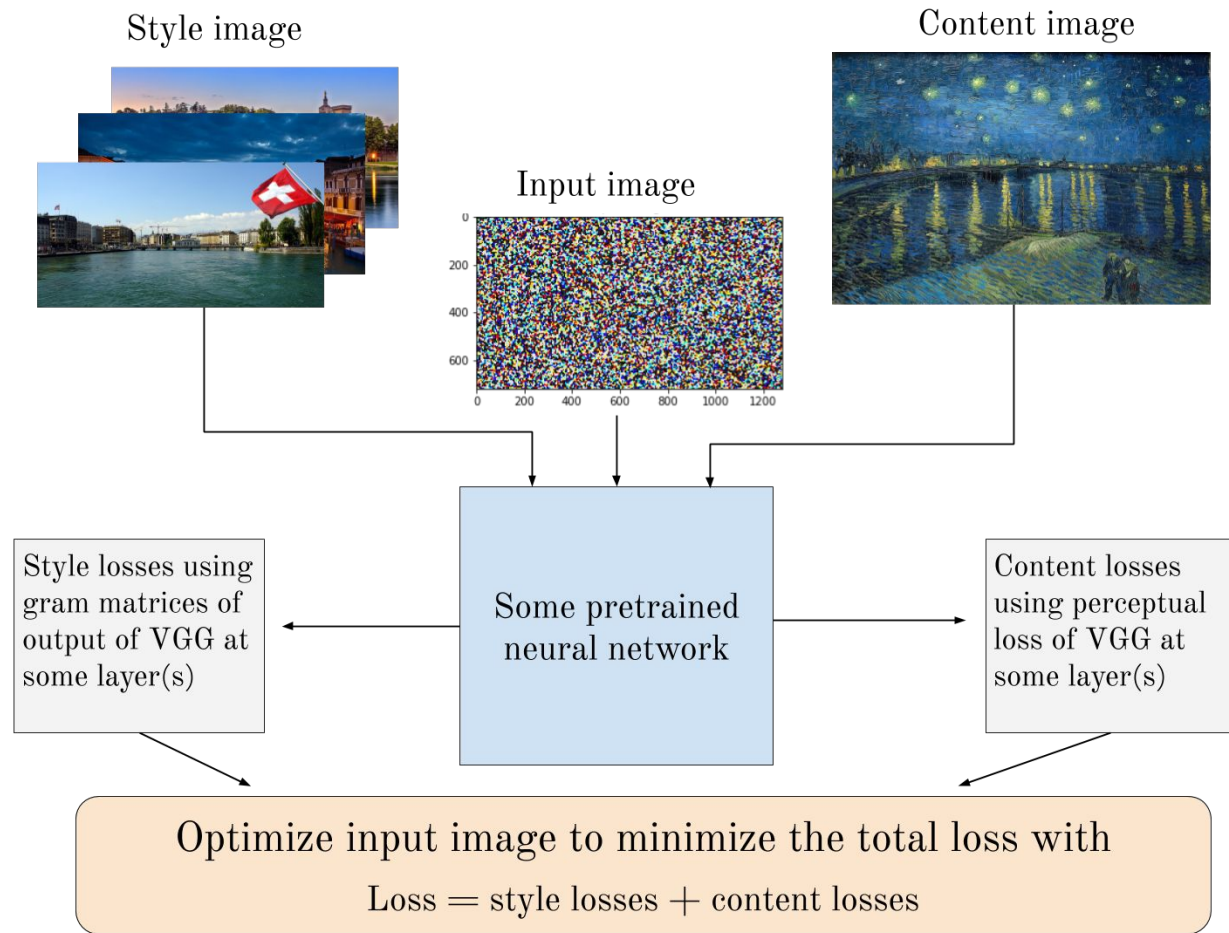
Content image

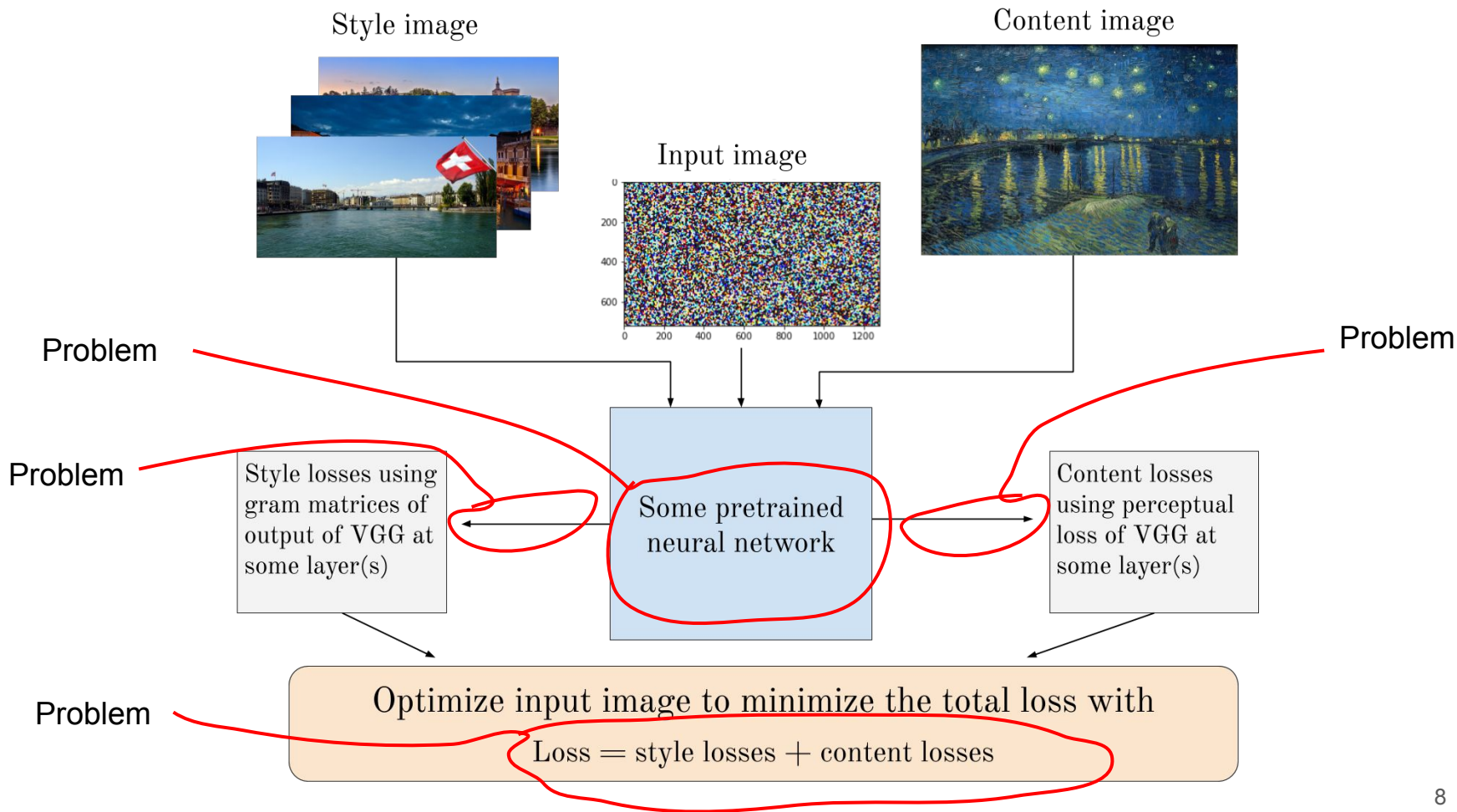


Style *images*



The setup





Why not just any neural network?

checkerboarding



- Sahil Singla blog post on style transfer

Why not just style and content loss?



Many style images seem to make content loss insufficient, losing large-scale content in input image

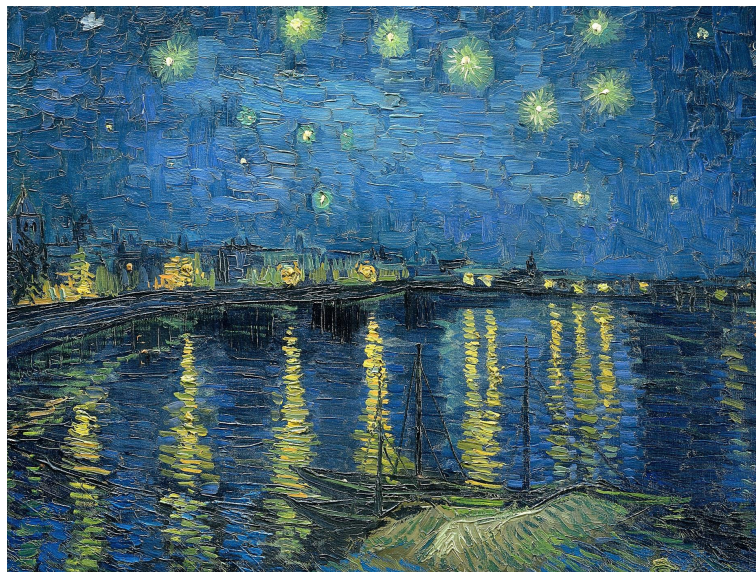
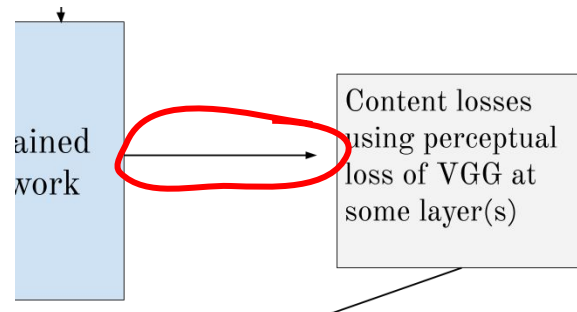
$$\text{Loss} = \text{style losses} + \text{content losses}$$



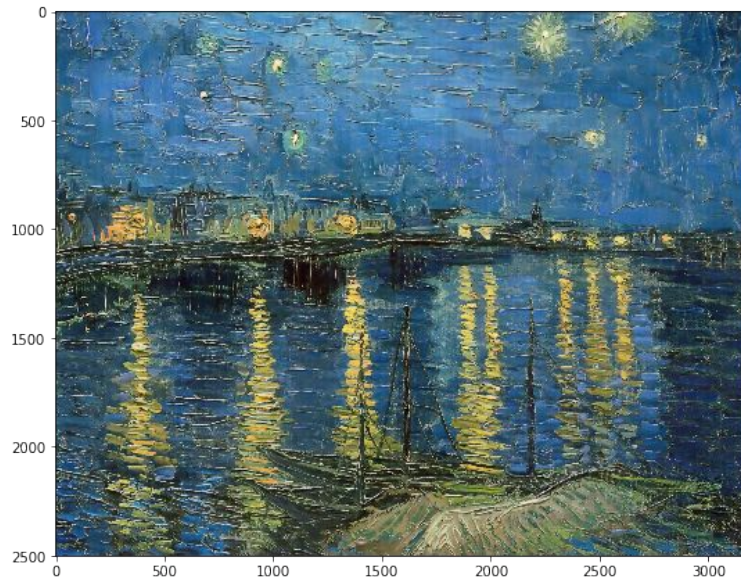
$$\text{Loss} = \text{style losses} + \text{content losses} + \text{MSE pixel loss}$$

Why not content/style loss from just 1 layer?

A: Not enough artistic control

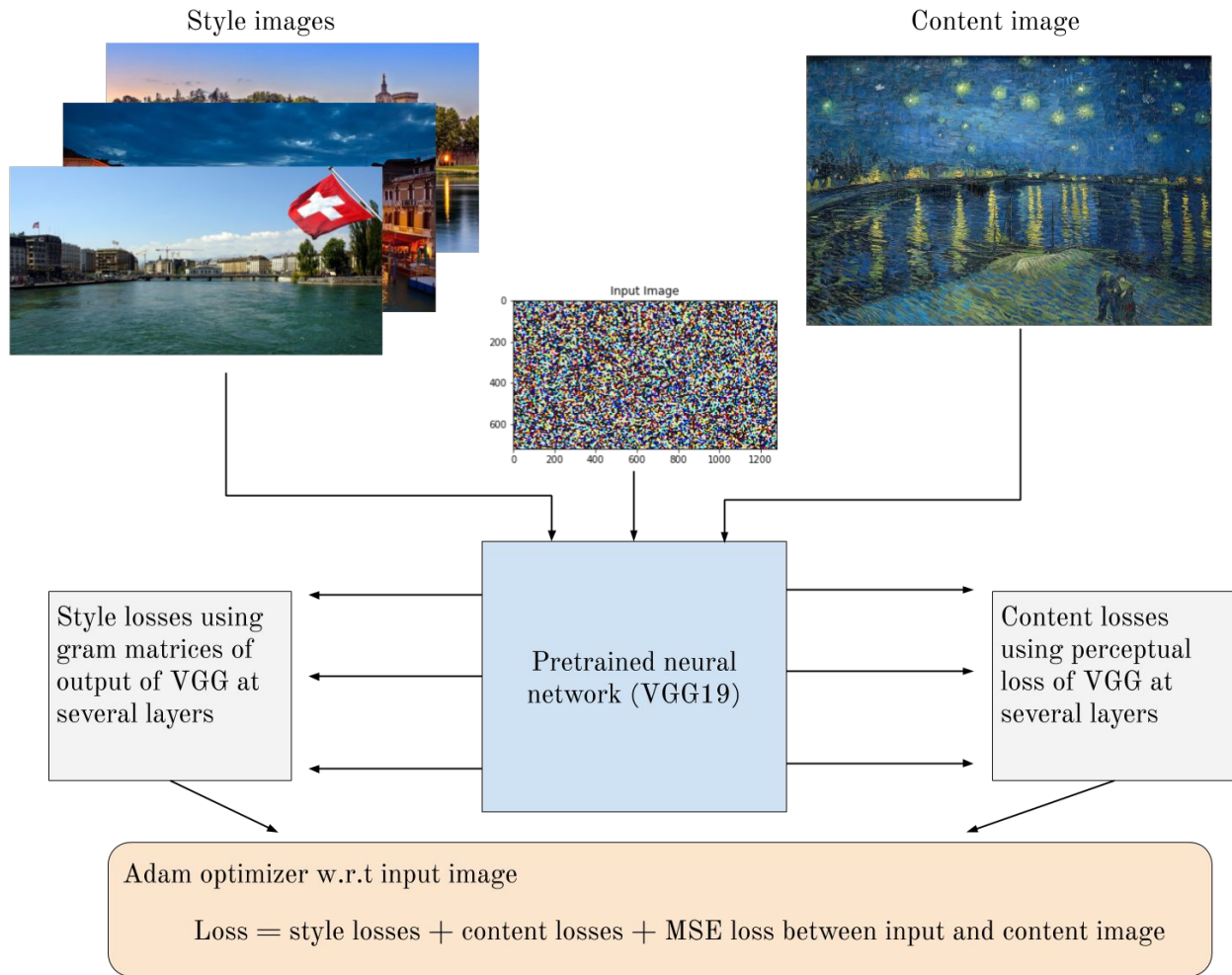


The original Van Gogh



Generated image using content/style loss from only 1 layer

The full setup





Van Gogh's *Starry Night Over the Rhone*, 1888

+



Modern photographs of Rhone and Venice

Then after
some
training...

