

What Can a GANsta Do For You?

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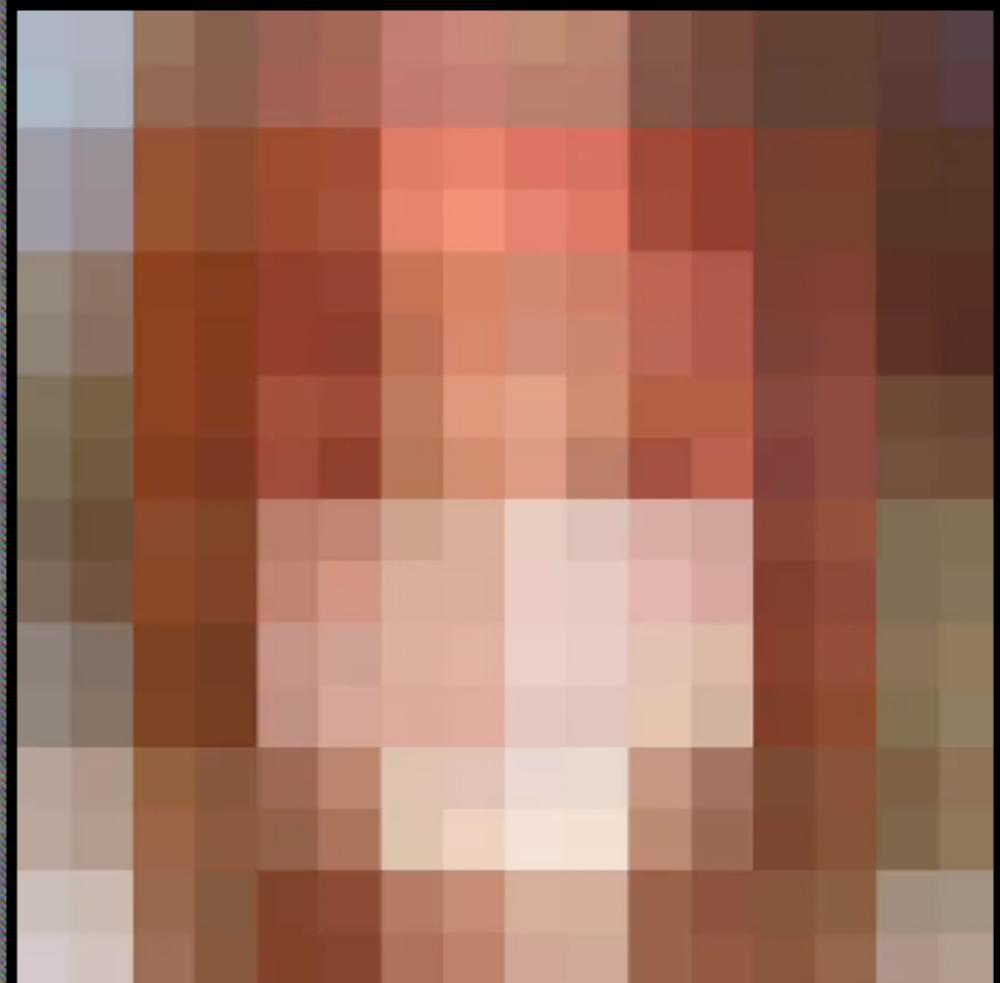


George Tang



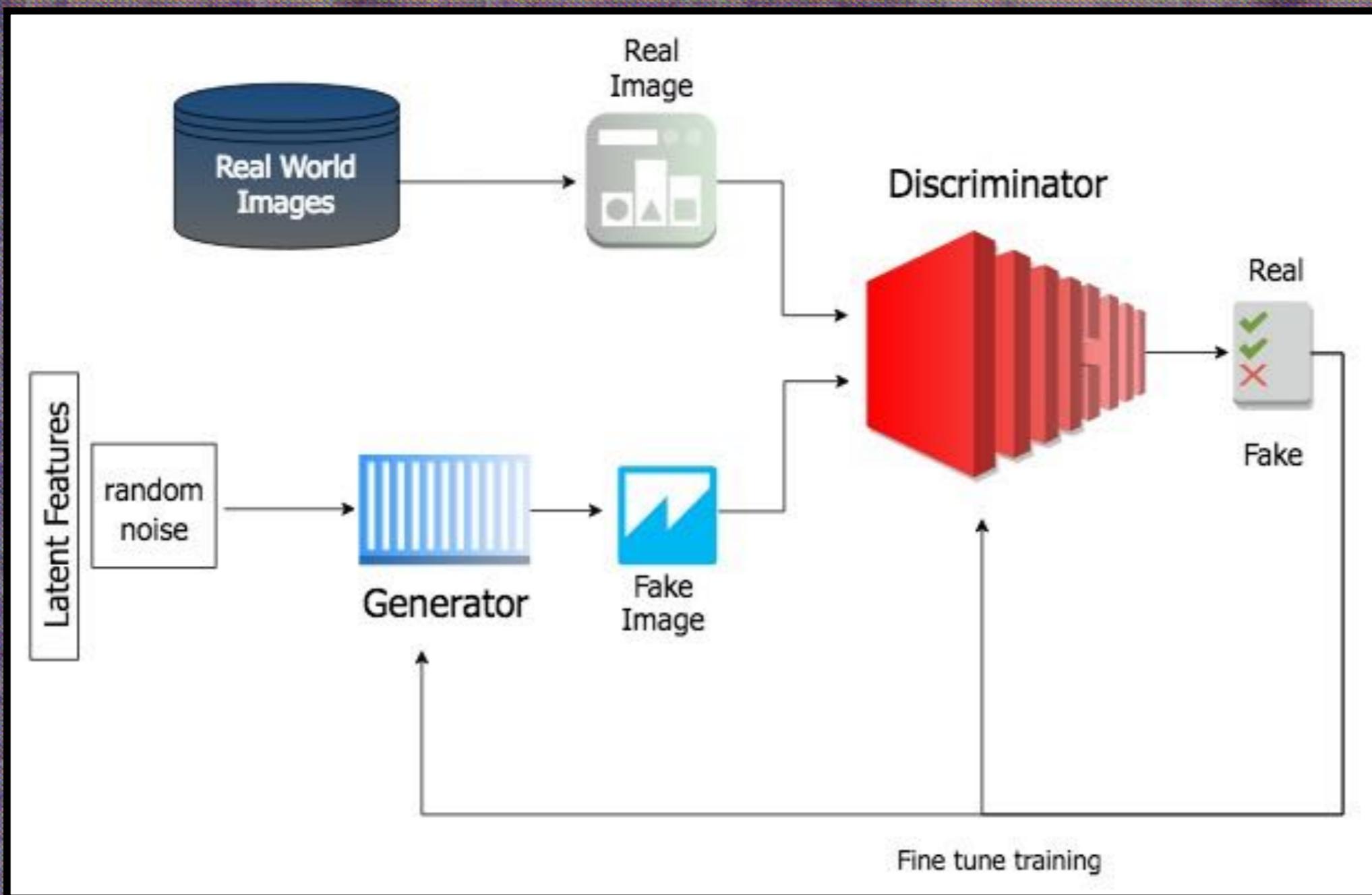
The WHY?

- GANs help with creative ideas
- Can take any image and make fake image
- Can restore photos, make low resolution to high resolution
- Simulate/predict future intelligence
- Text to image
- New technology, the few real world applications are for multimedia industry



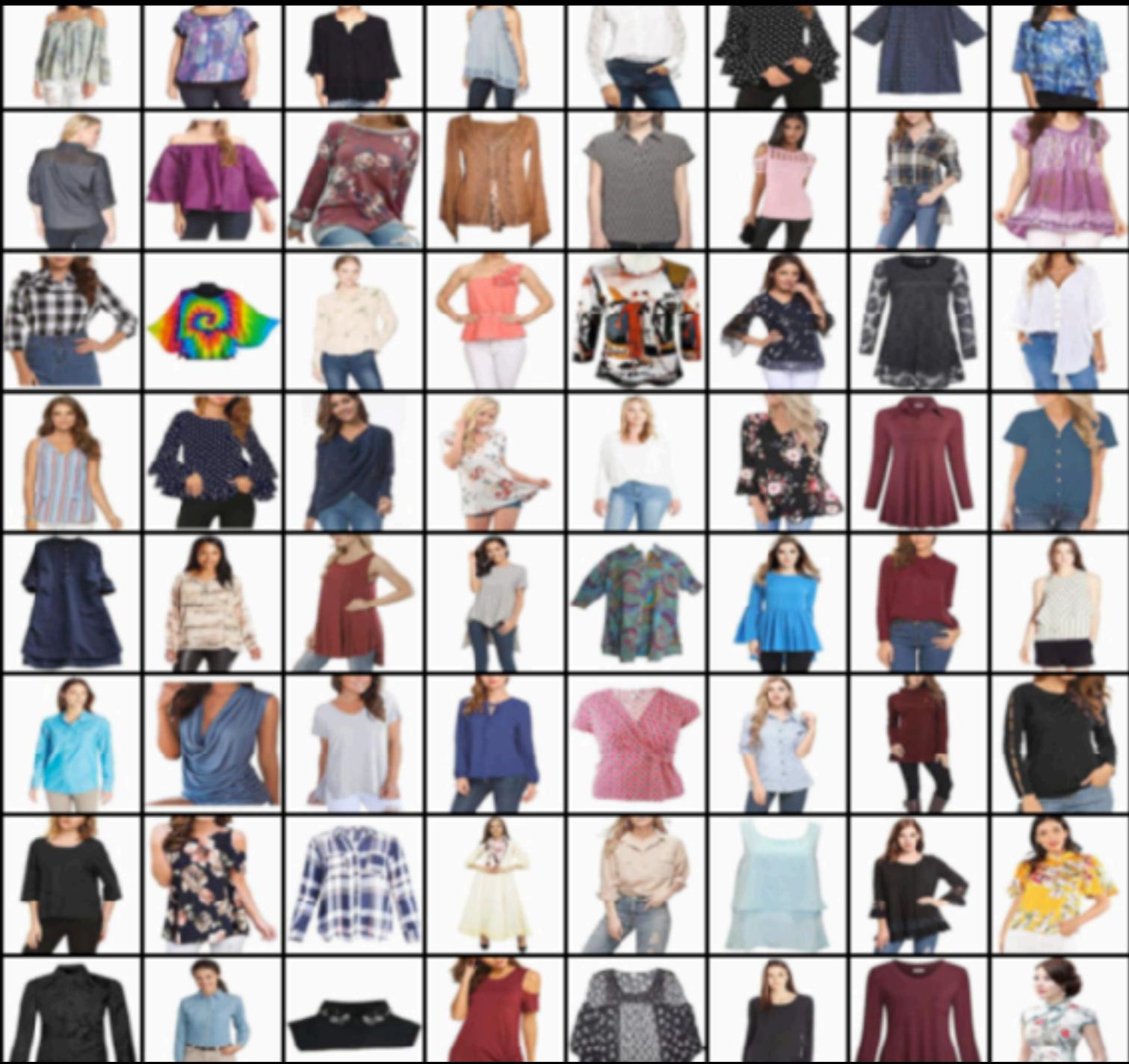
What is GANs?

- **Generative Adversarial Network** - two AIs fighting against each other
- **Generator network to make fake images**
- **Discriminator network to decide if image is real or fake**
- **Discriminator gives feedback to self and generator**
- **Unsupervised learning**

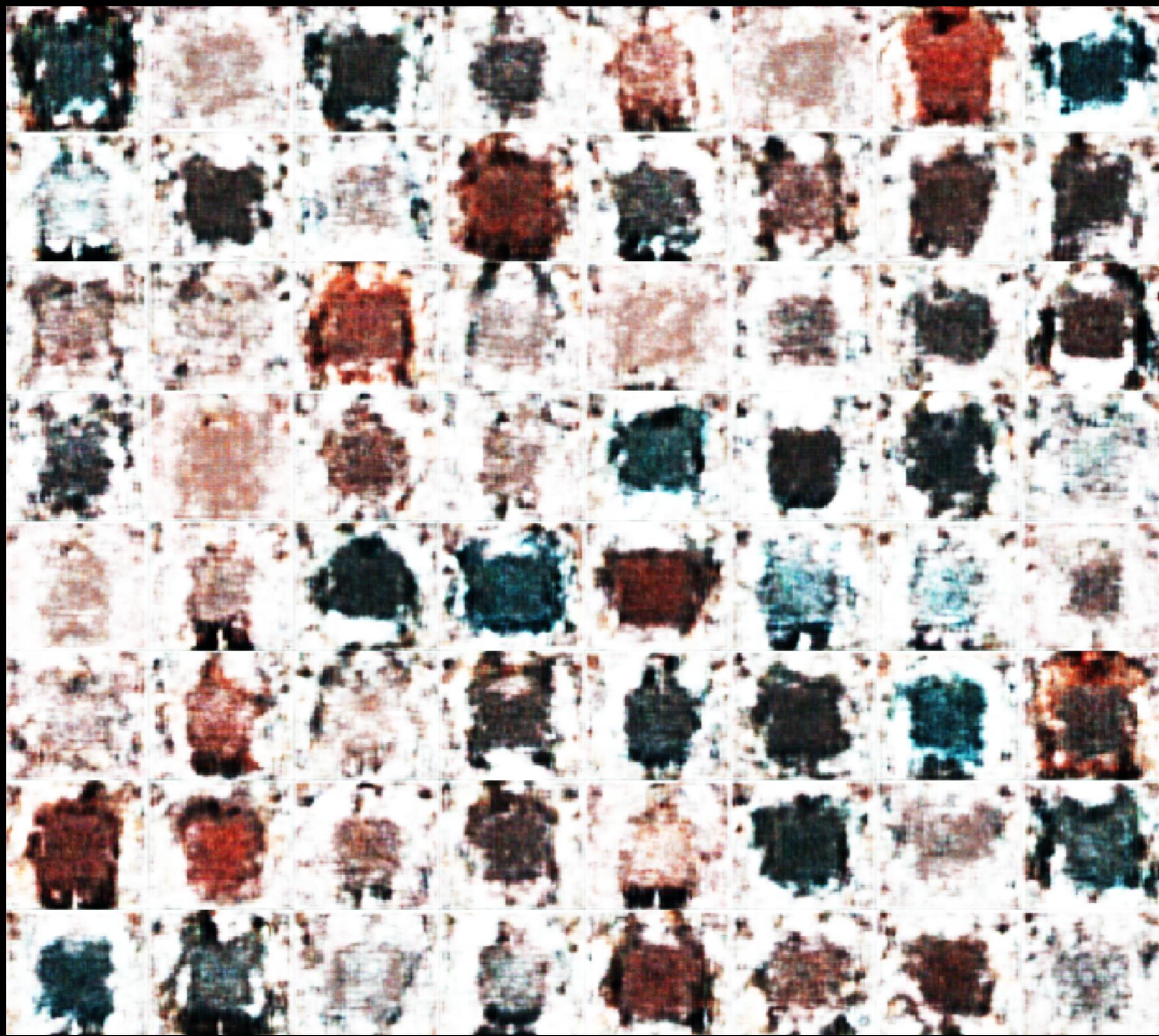


The Data & Tech

- **Data Source: Amazon Women's Fashion**
- **Used Scrapy to download 25K+ images**
- **Image reshaped to 256 x 256, white background**
- **PyTorch and Keras GANs**
- **Trained on a single Nvidia 1080 TI GPU**



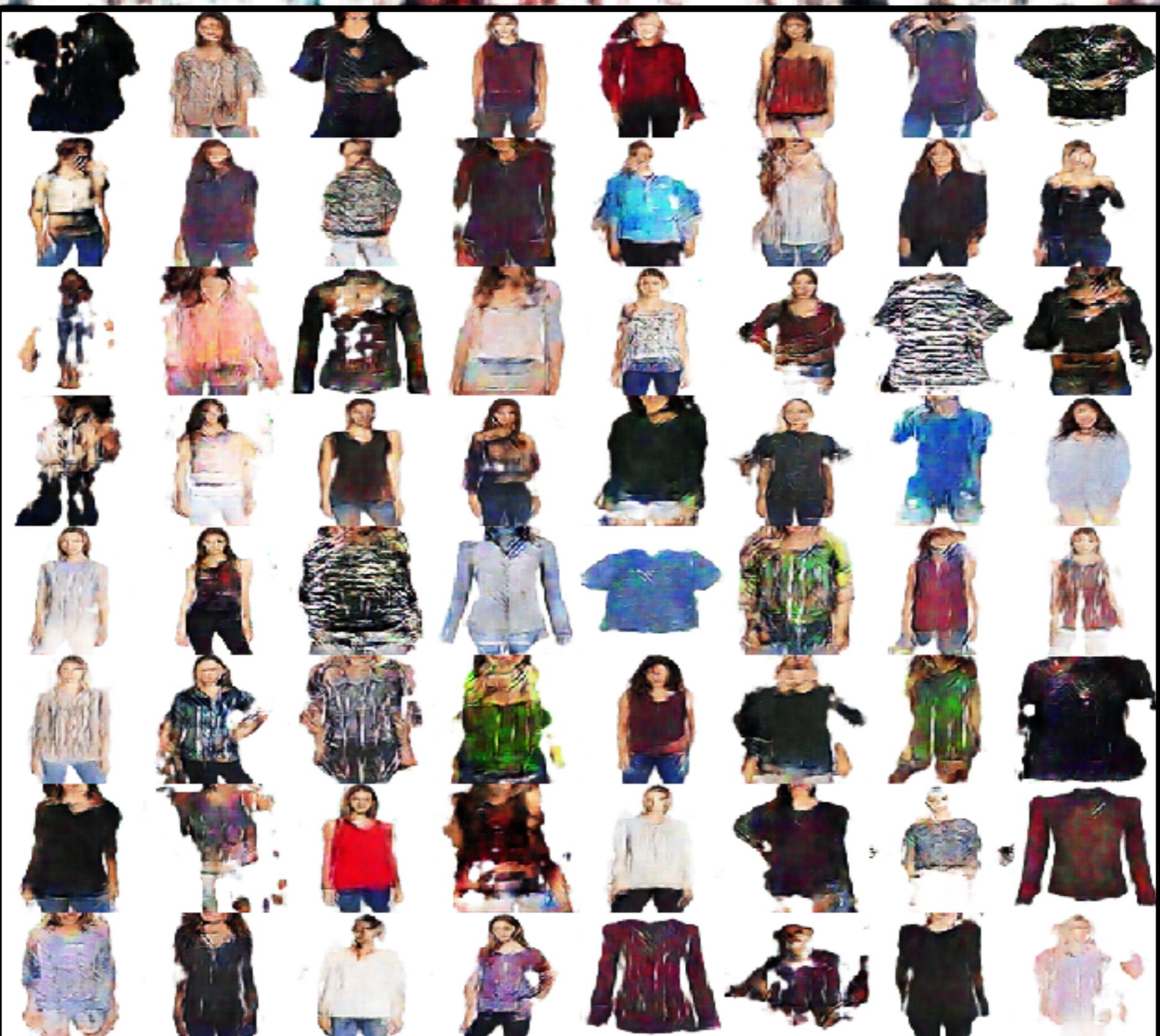
**PyTorch - GANs training, generator learning to make real(fake)
images, output 128 x 128**



PyTorch - Over many iterations, the generator makes images more realistic, 128 x 128 output

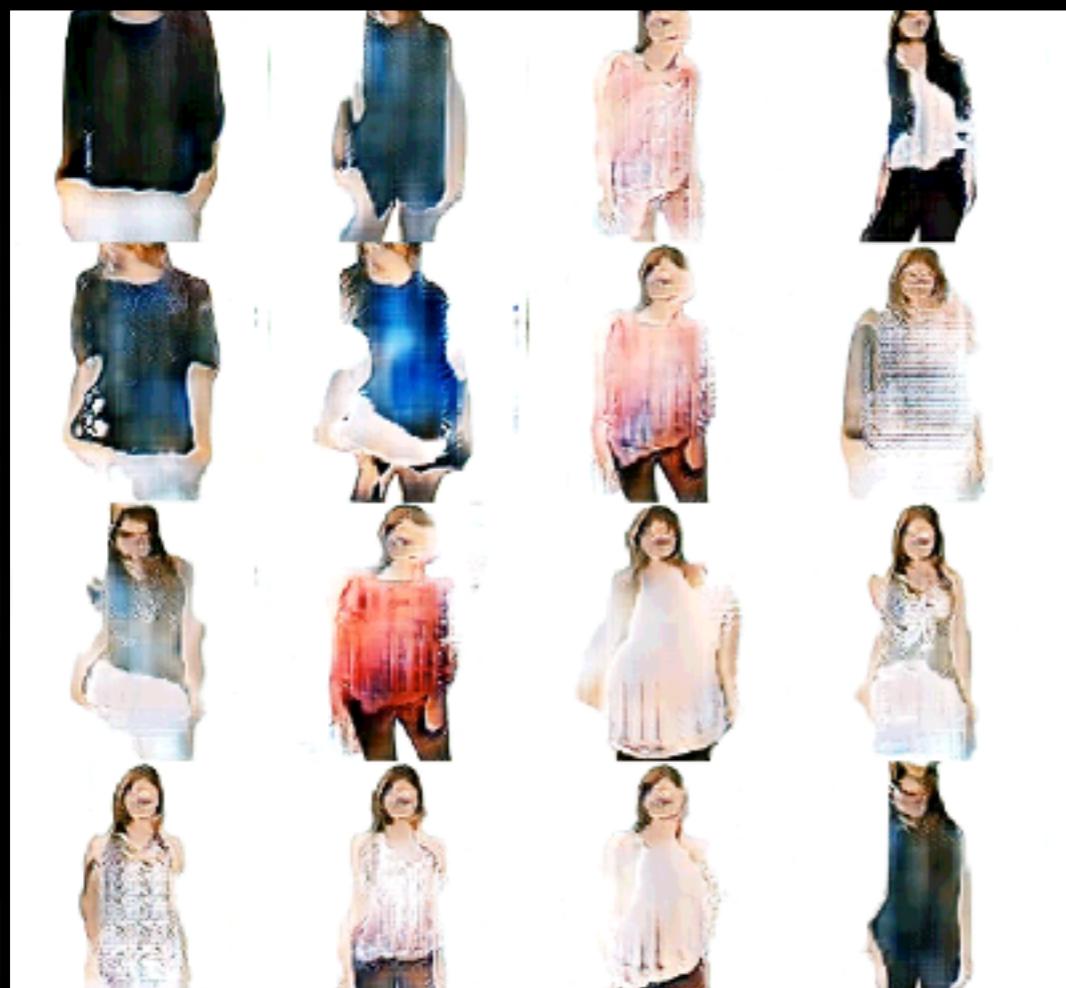


PyTorch - Results after 24 hours, 128 x 128 output

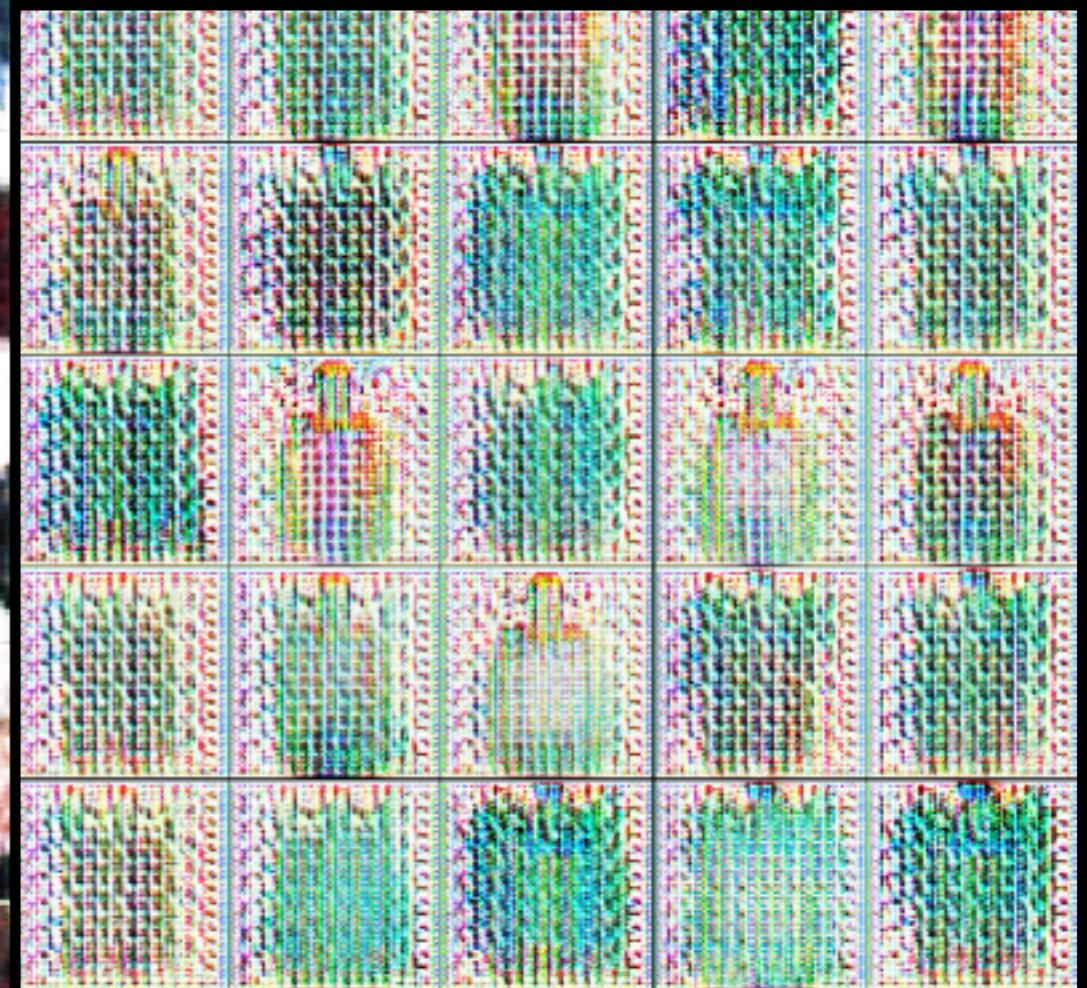


The Difficulties

- Time, need Nvidia gpu(s) for learning, cpu learning is an eternity
- The higher the resolution output, more time is needed for learning because of increase in parameters
- Small adjustments have major-effects, good and bad
- Tuning is very time consuming because have to tune 2 networks
- Balance is needed for GANs to be stable, Discriminator should win 50% of the time, fight not to win but a draw



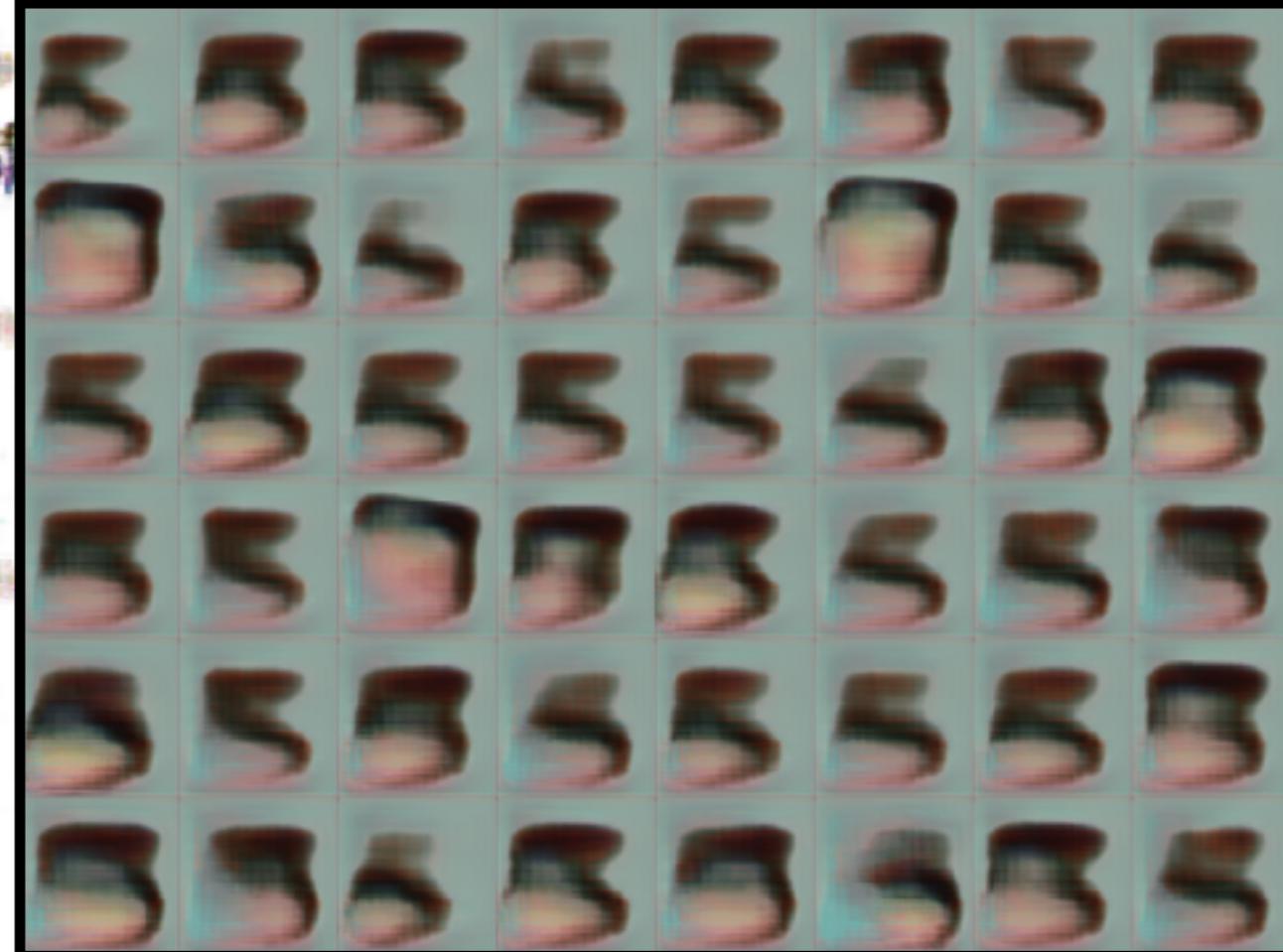
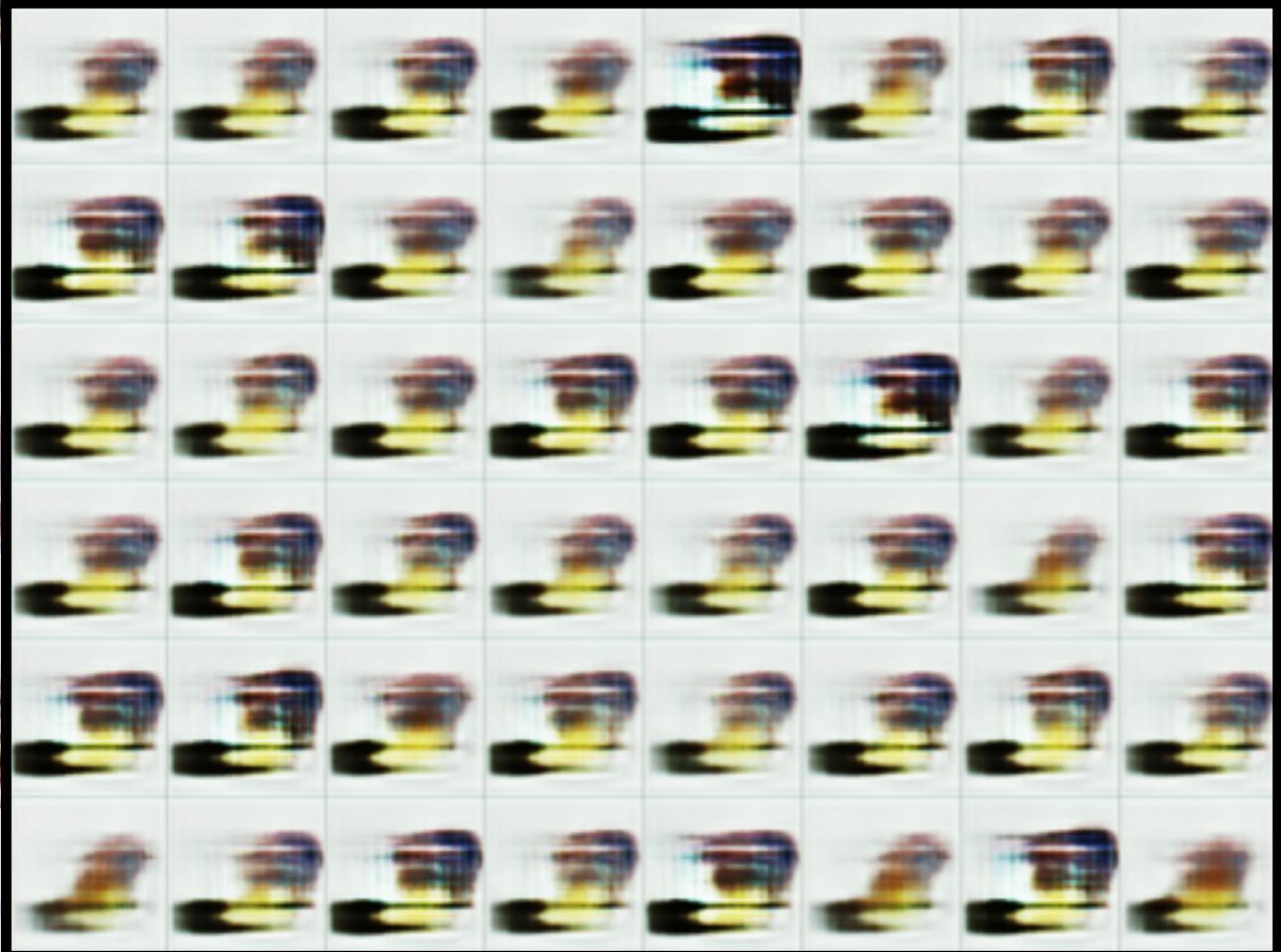
256 x 256 output



256 x 256 output of discriminator too lenient

Other creations

- Created fake heels based off Amazon 4 star ratings and above
- Created fake Pokemon, can see eyes being generated after 12 hours of training
- Both output 256 x 256
- Keras library





References

- <https://github.com/eriklindernoren/PyTorch-GAN>
- <https://github.com/manicman1999/GAN256>
- <http://cs231n.github.io/>