Grayscale Image Colorization with GAN

IE 7615 - Neural Networks & Deep Learning

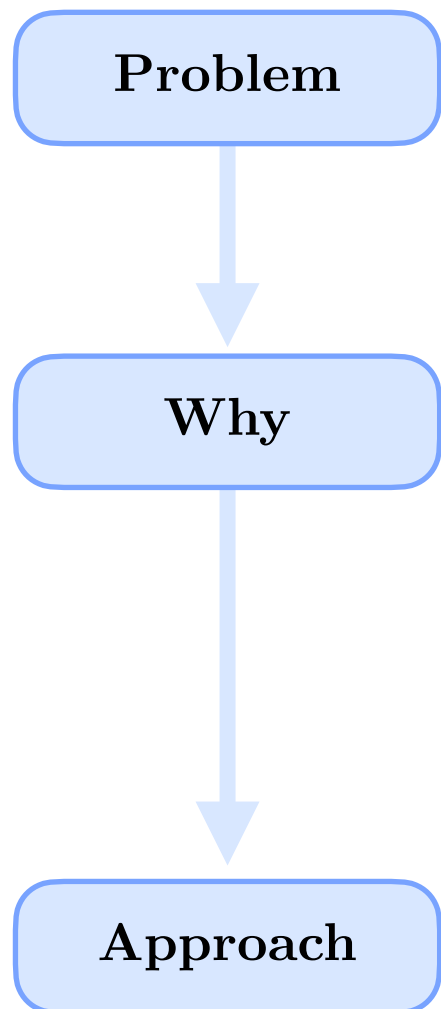*Team Members:*

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Thursday 20th, April 2023
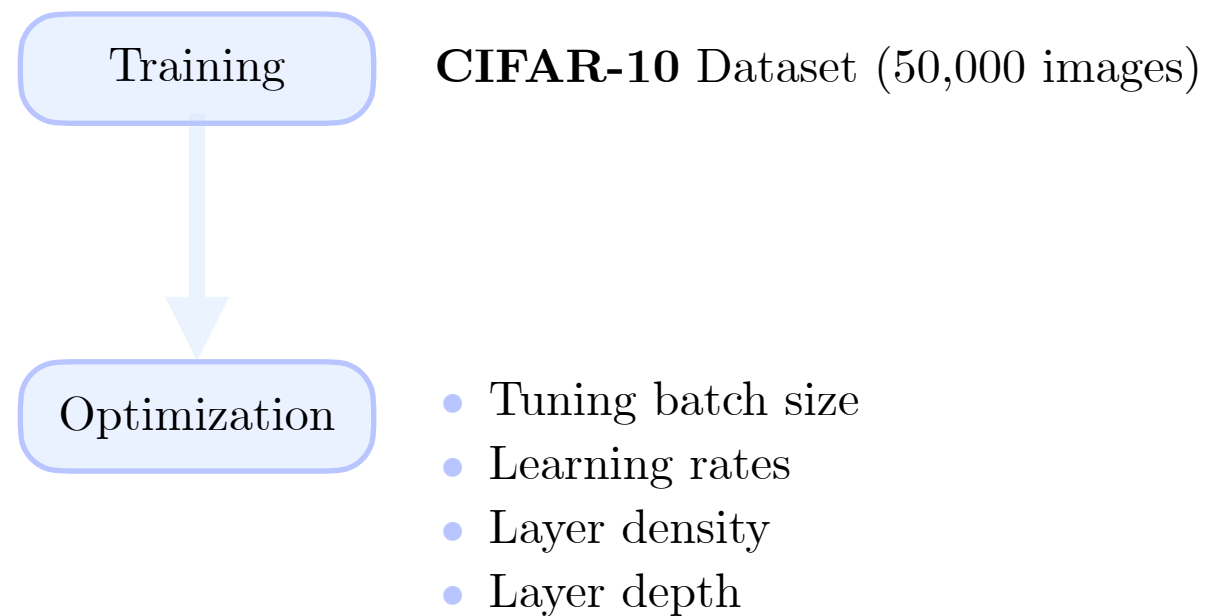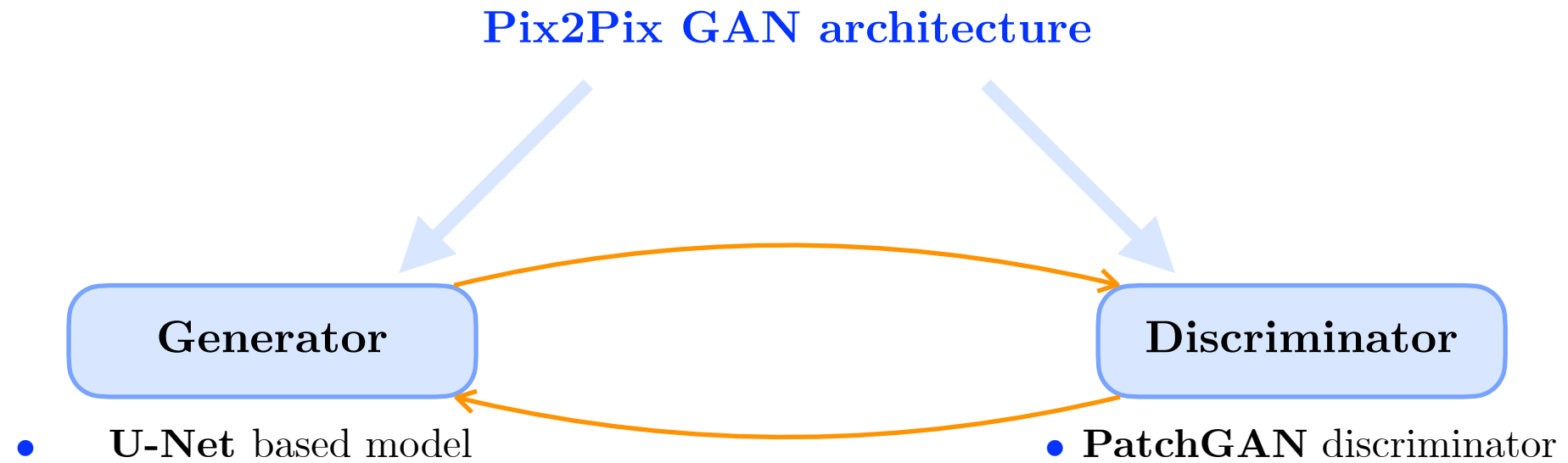
Motivation

Problem

- Automatic image colorization

Why

- Enhance grayscale images
  (i.e. save time and resources
  for artists)

Approach

- Pix2Pix GAN: Image-to-image translation
- Relation to existing work: Building upon
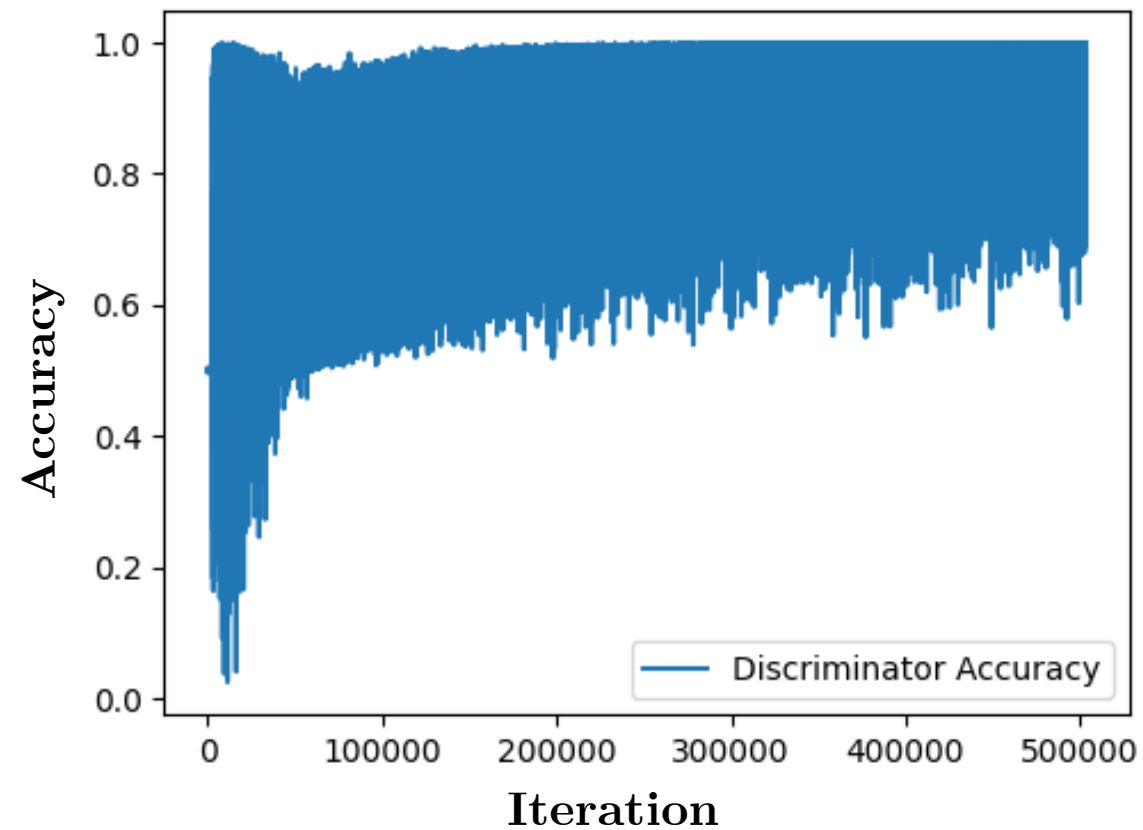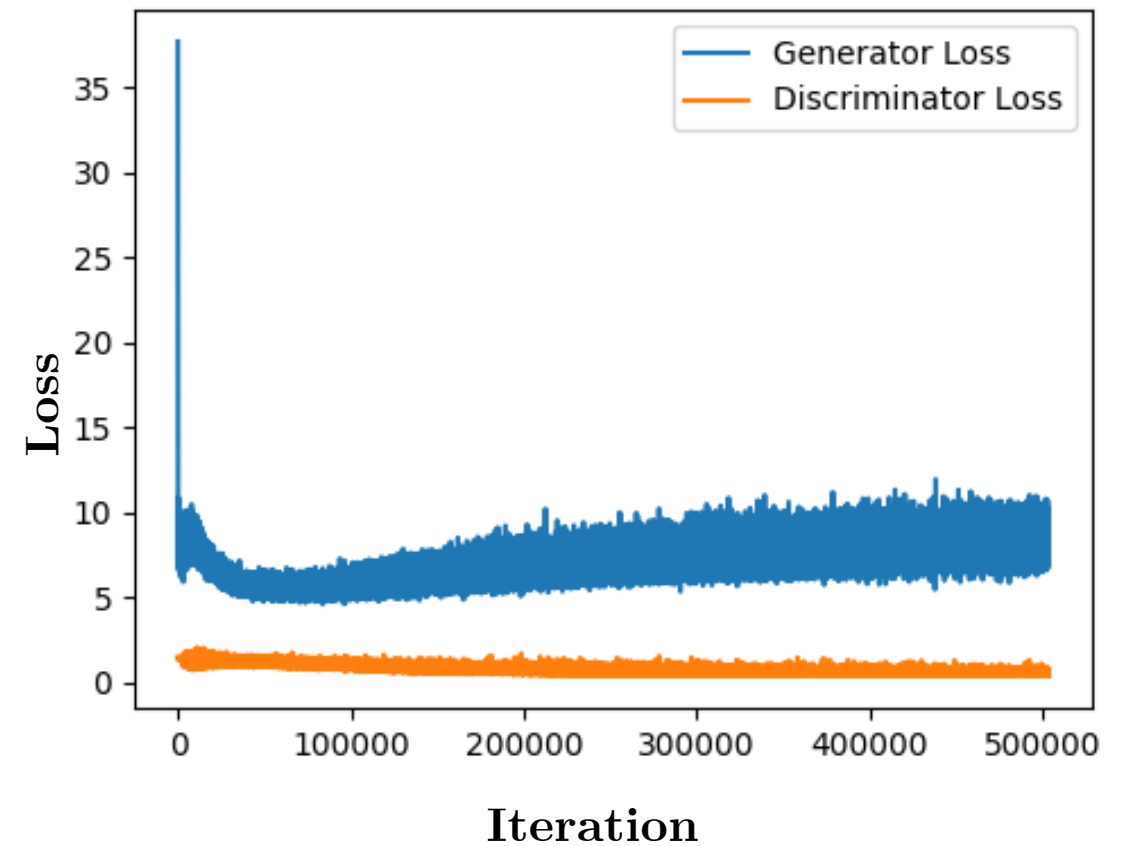 Pix2Pix architecture (Isola et al., 2017)

Approach

Pix2Pix GAN architecture

| **Generator** | | **Discriminator** |

- **U-Net** based model
- **PatchGAN** discriminator

Training — **CIFAR-10** Dataset (50,000 images)

Optimization
- Tuning batch size
- Learning rates
- Layer density
- Layer depth

Results

660 Epochs ⌢ 50,000 Iterations
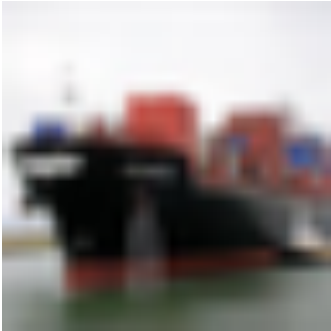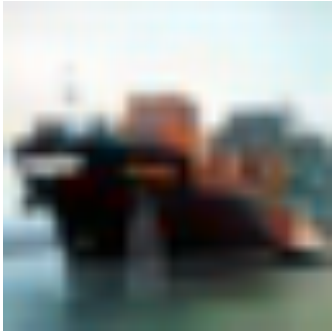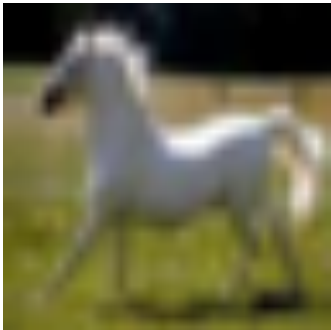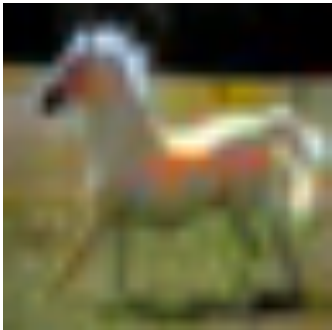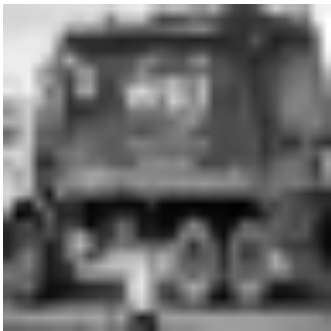
Accuracy

Losses

Results

Gray Image	Real Image	Colorized Image	PSNR Score (dB)	SSIM Score
			30.9472	0.9927
			31.0698	0.9972
			32.6258	0.9997
			31.1765	0.9981

Conclusion

Achievements

- Plausible colorized images, optimized learning process

Take-Away

- **Pix2Pix GAN** architecture shows promising potential in image colorization

Future Directions

- Further parameter tuning
- Exploring higher-resolution images
- Extending to other image-to-image translation tasks

Thank you for your attention!

Questions?