TEXTURE TO TEXTURE TRANSLATION

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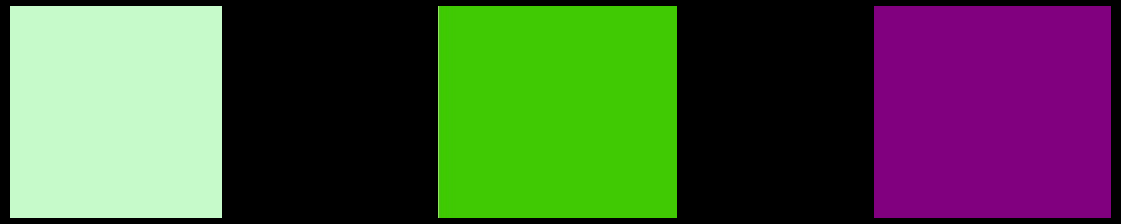
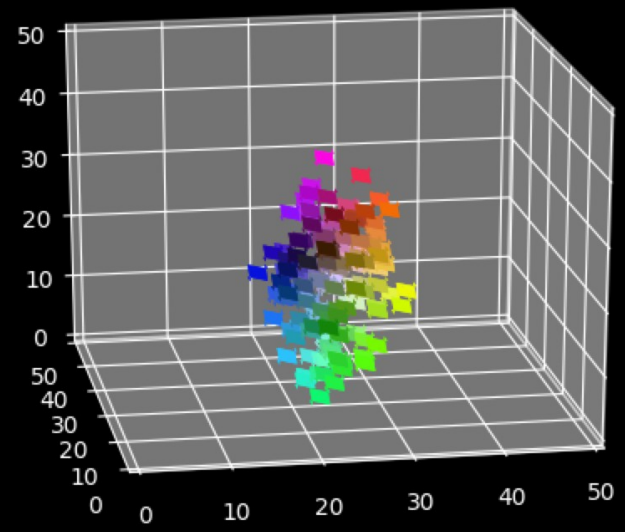
Under the mentorship of Dr. Eric Heim in RISA

TRIPLET EMBEDDING NETWORKS

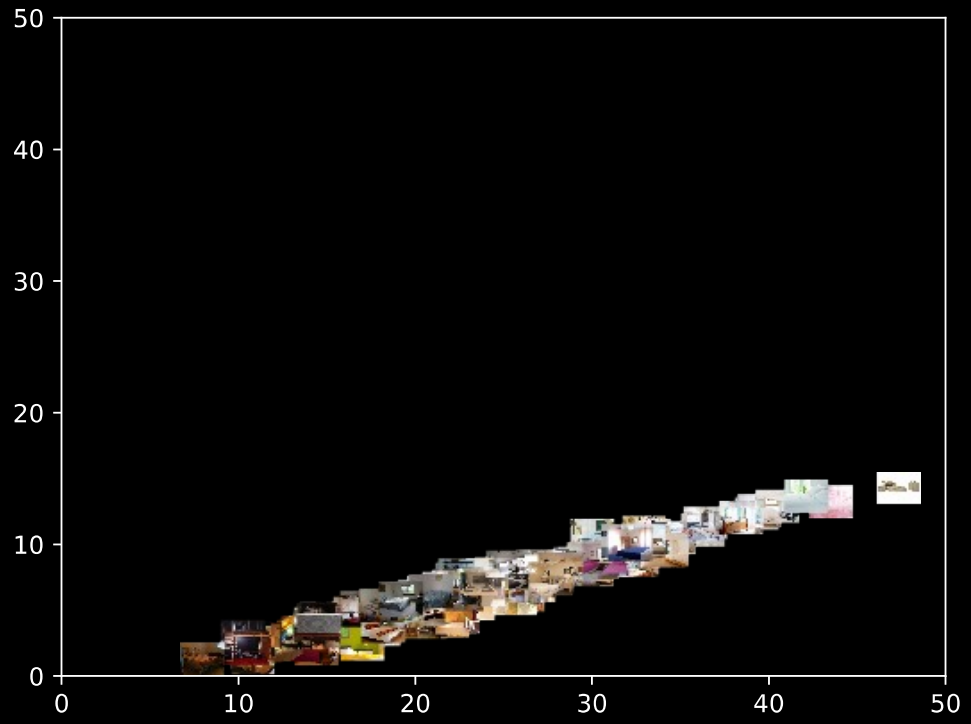


A B C

3d embedding of colors using triplet network

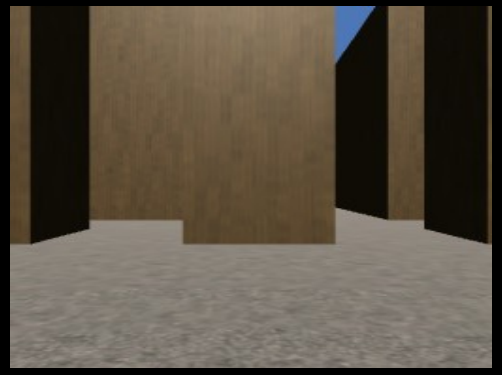


LSUN Bedrooms sorted by color in 2 dimensions



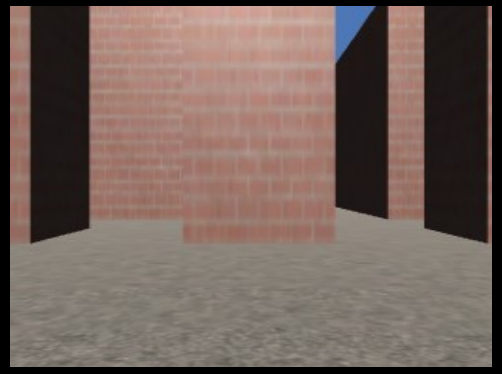
THE PROBLEM

Sees



Drone behavior: Avoid Wall

Sees



Drone behavior: ??

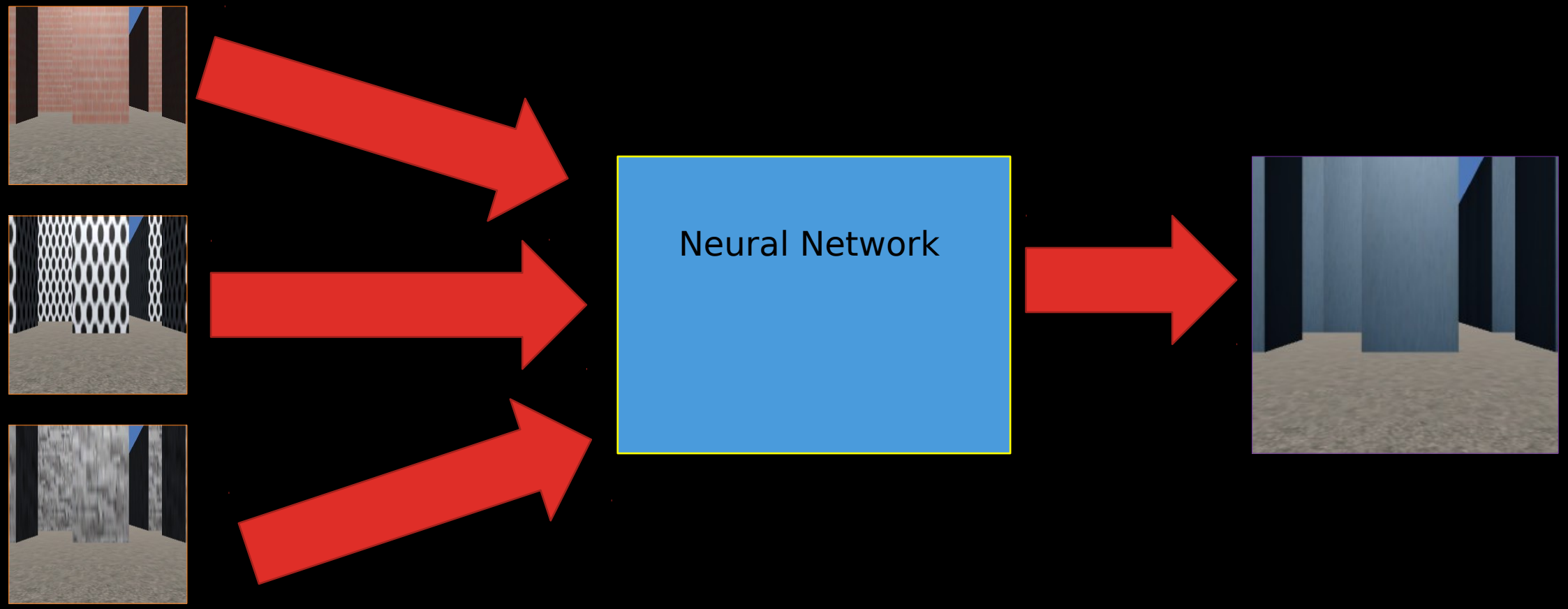
AGENDA

Main Project/Goal

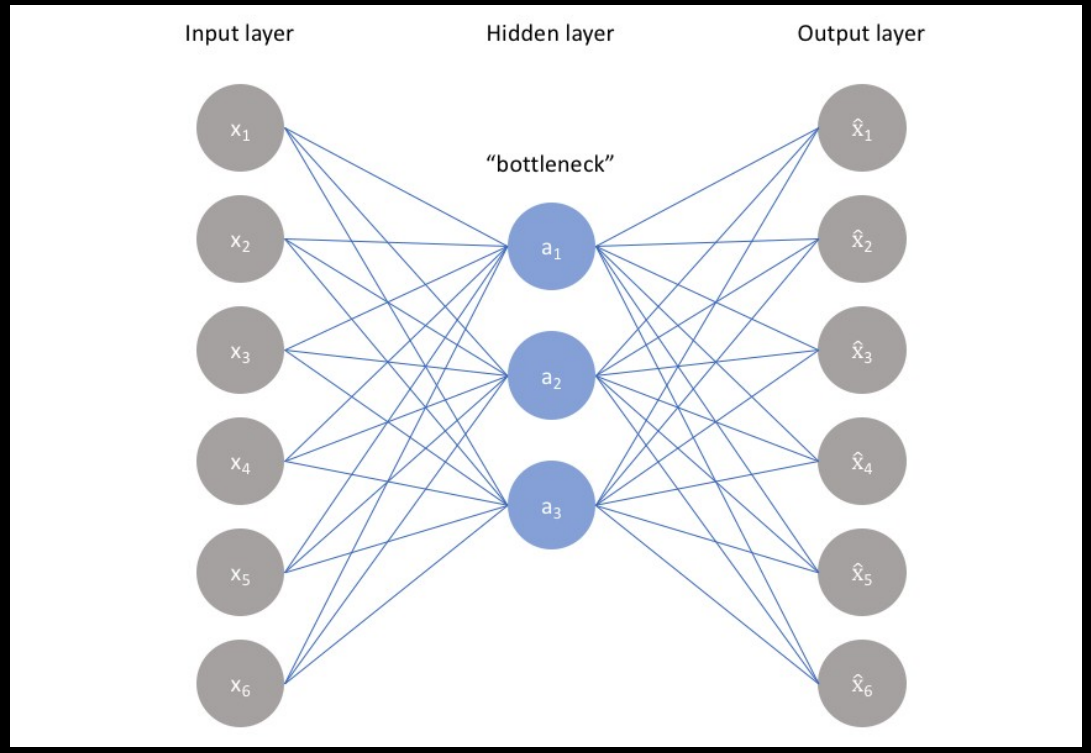
- -Auto Encoder
- -Auto Encoder Residual Network
- -Standard Auto Encoder
- -Cycle GANS

OUR SOLUTION

- Generalize all input images to a common “distilled image”

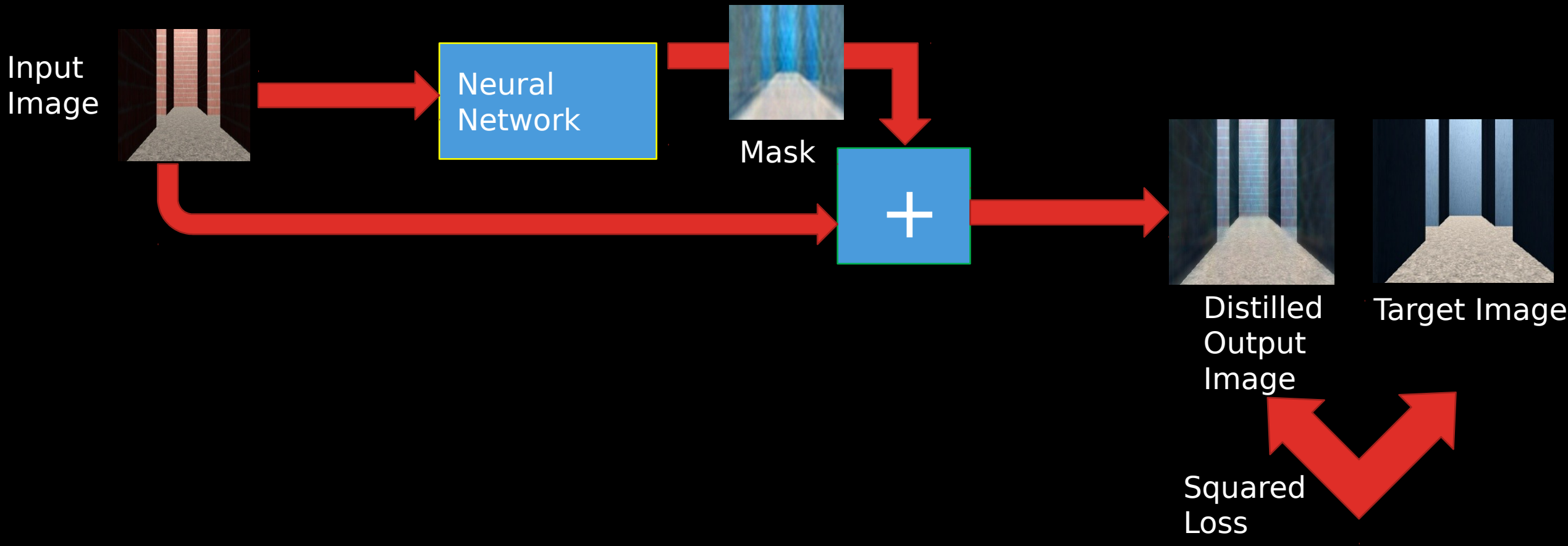


AUTO-ENCODER/DECODER



TEXTURE TRANSLATION USING A RESIDUAL AUTO-ENCODER

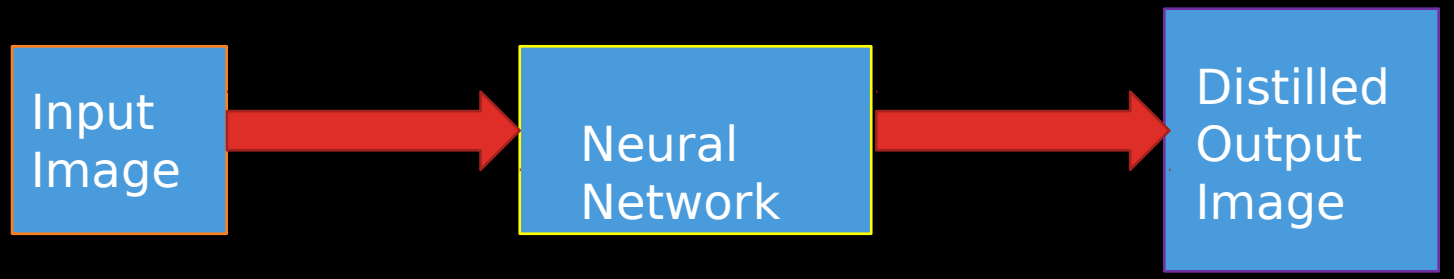
Residual Network Architecture

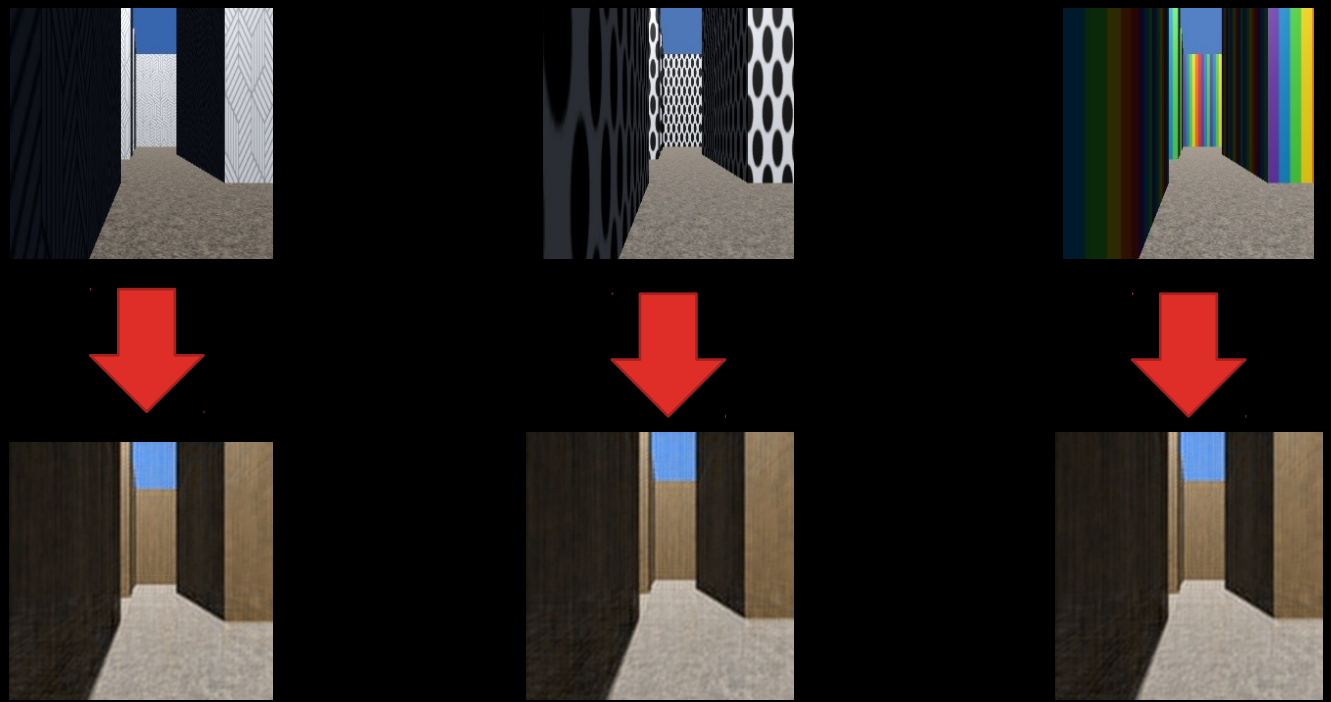


MANY TO ONE TEXTURES WITH RESIDUAL

Target

TEXTURE TRANSLATION USING A STANDARD AUTO-ENCODER

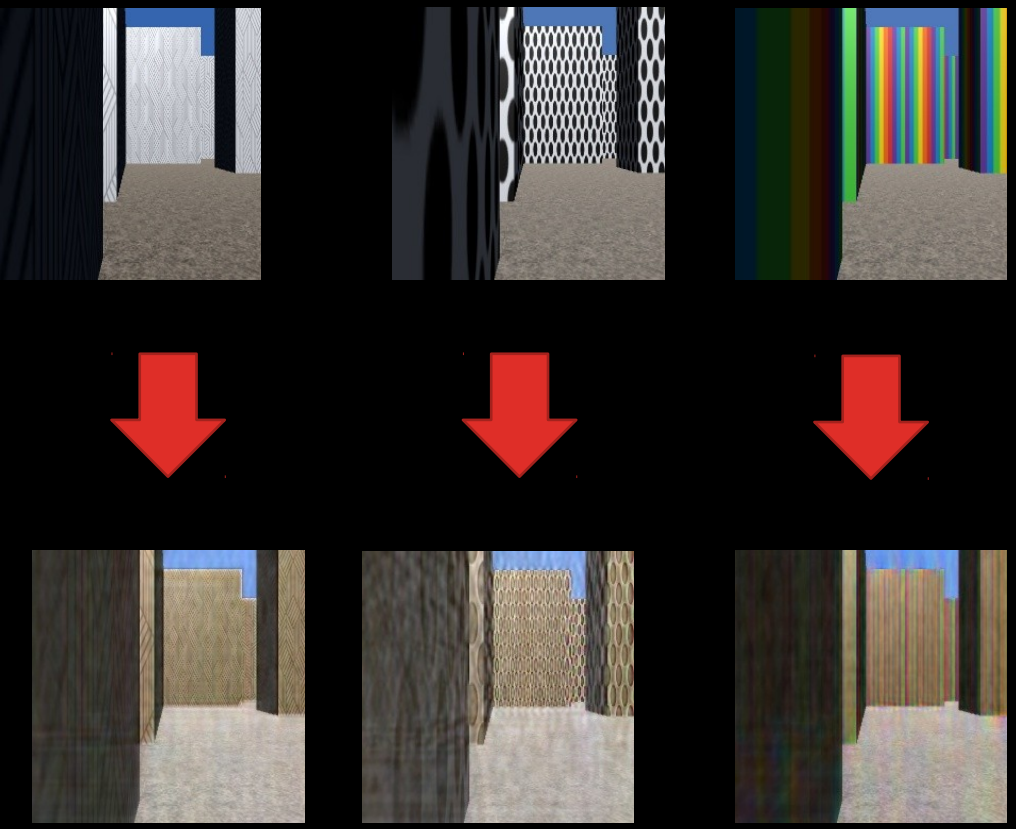




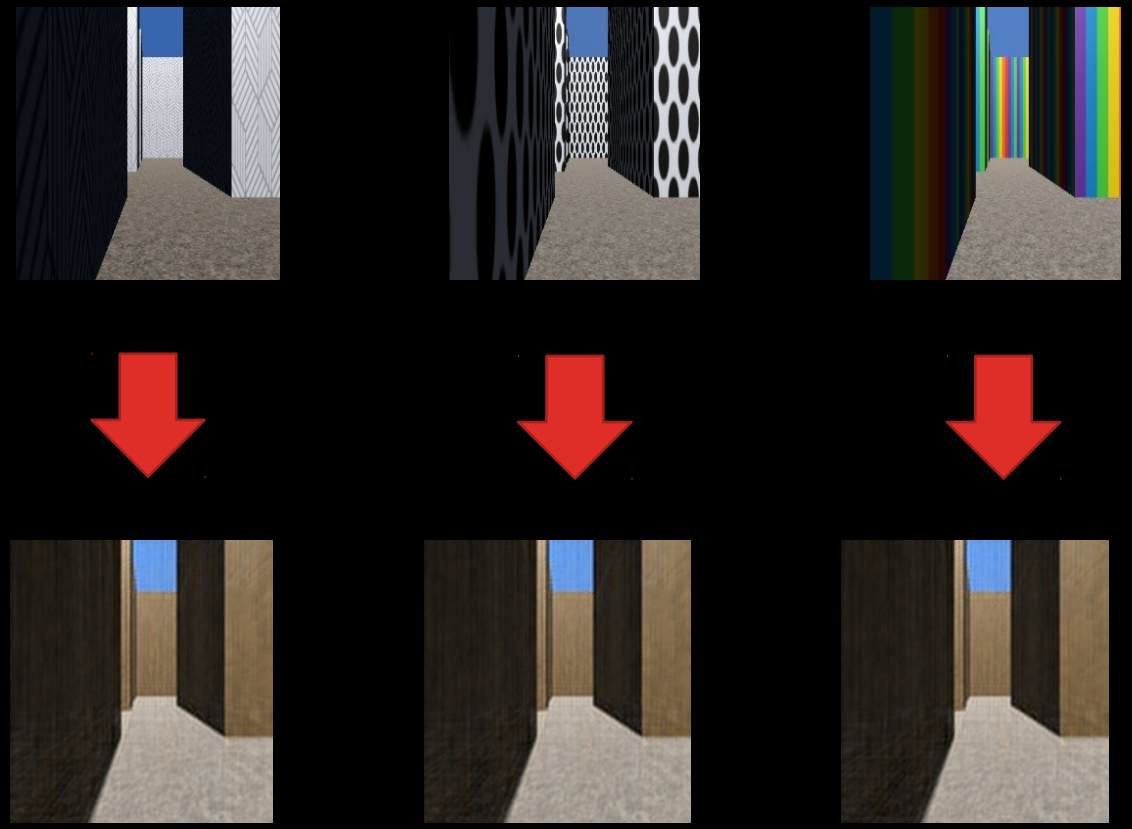
Target

RESIDUAL VS NON-RESIDUAL

Residual Network

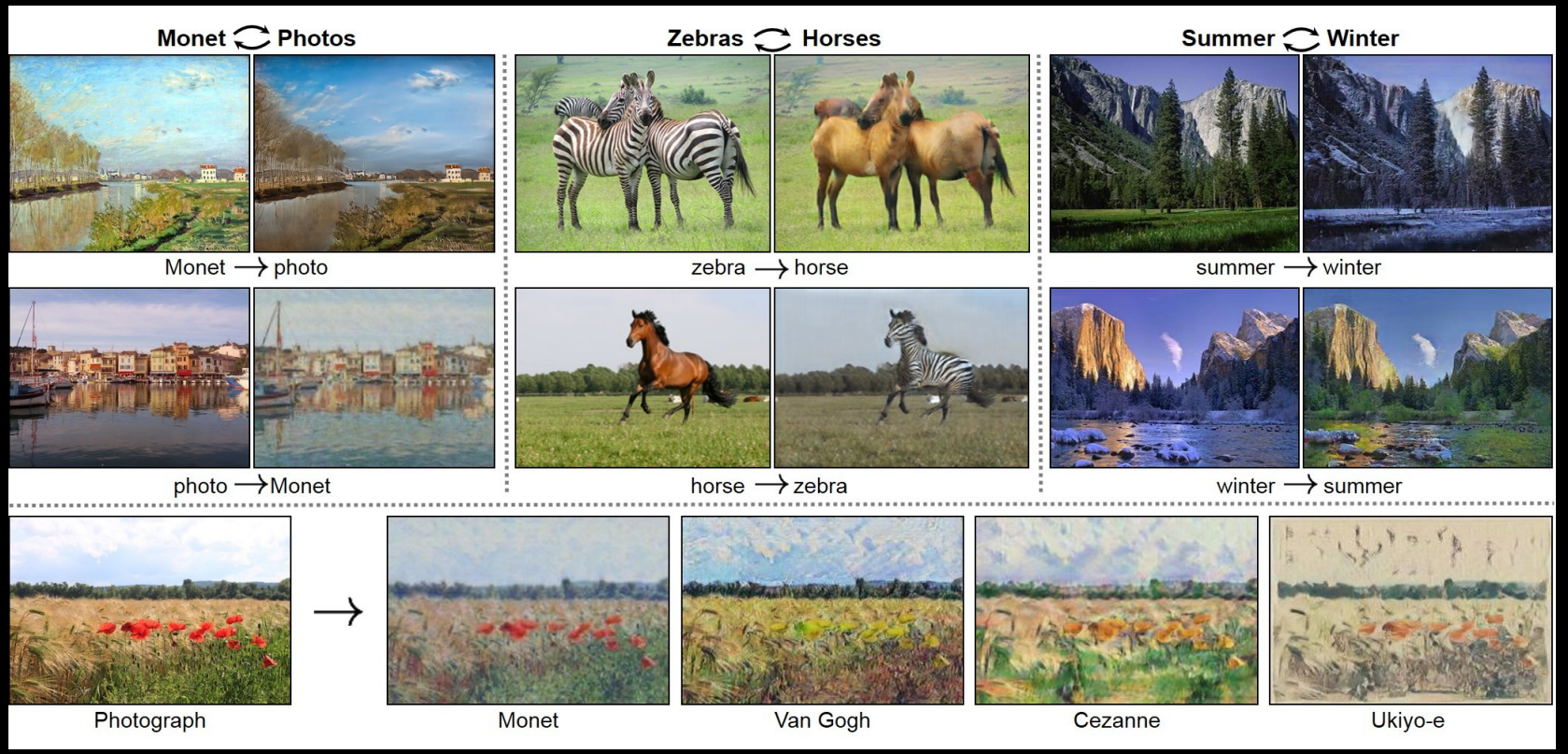


Non-Residual Network



CYCLE GAN*

*

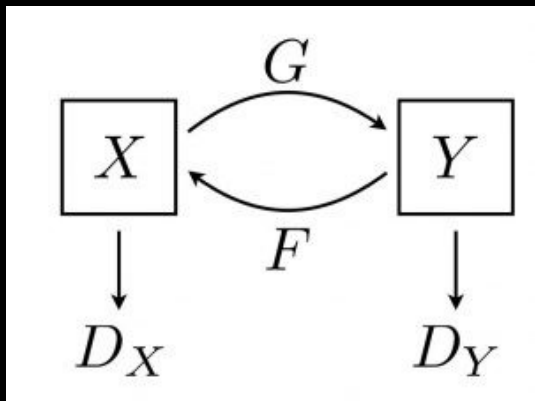


***Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks**

Jun-Yan Zhu, Taesung Park, Phillip Isola, Alexei A. Efros

CYCLE GAN ARCHITECTURE

- Dx – Discriminator (Is this image in style X real or fake(generated))
- Dy – Discriminator (Is this image in style Y real or fake(generated))
- Gx– Generator(Make an image of style X into one of style Y)
- Fy– Generator(Make an image of style Y into one of style X)
- Cycle loss = |F(G(x))- x| + |G(F(y)) –y|
- Loss = Discriminator_Loss + lambda*Cycle_Loss



CYCLE GAN RESULTS

CONCLUSION

Ideas for improving adaptability of reinforcement learning agents:

Auto Encoder with Residual Network
Standard Auto Encoder
Cycle GANS