Computer Vision

Group Project

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Outline

- DeblurGAN
- AutoGAN
- BIGAN
- Disco GAN
- HoloGAN
- 3D IWGAN
- Face Normalization Model
- Generative Image Inpainting
- InfoGAN
- Group project expectations

DeblurGAN

Paper Title: DeblurGAN: Blind Motion Deblurring Using Conditional Adversarial Networks

Conference: CVPR 2018

Authors: Orest Kupyn, Volodymyr Budzan, Mykola Mykhailych, Dmytro Mishkin, Jiří Matas

Github: https://github.com/KupynOrest/DeblurGAN

AutoGAN

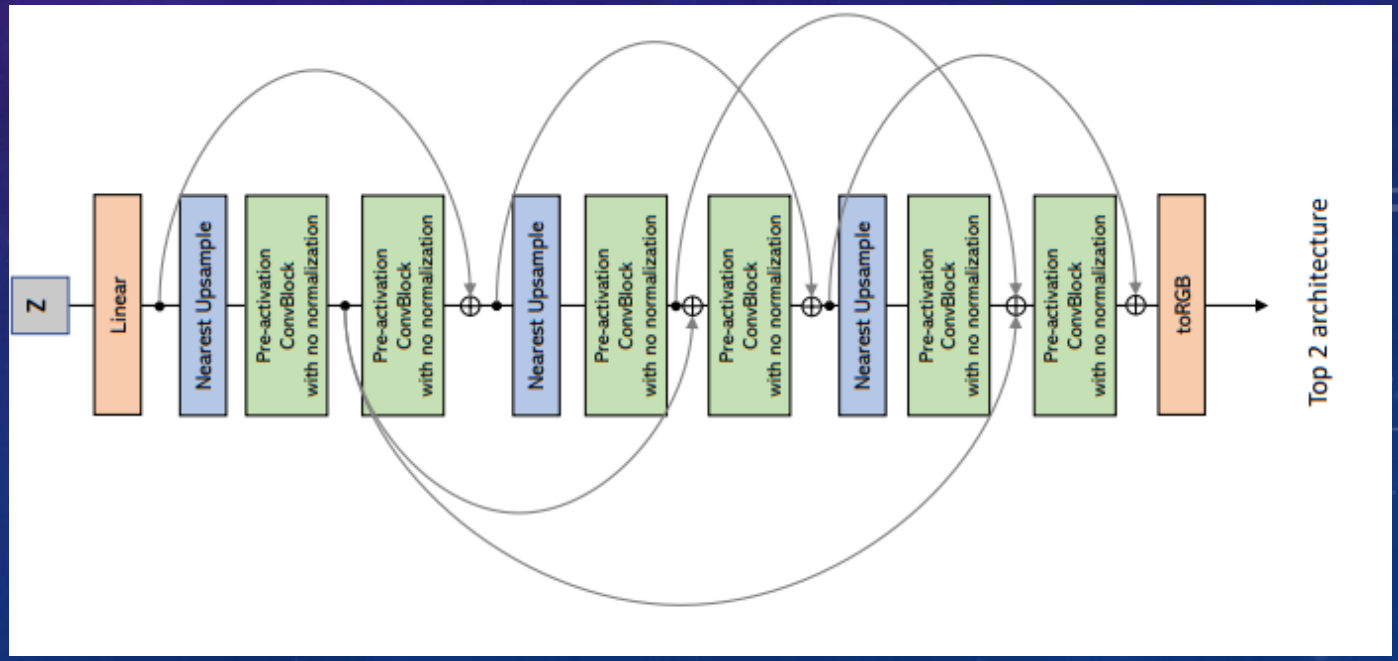
Paper Title: AutoGAN: Neural Architecture Search for Generative Adversarial Networks

Conference: ICCV 2019

Authors: Gong, Xinyu and Chang, Shiyu and Jiang, Yifan and Wang, Zhangyang

Github: https://github.com/TAMU-VITA/AutoGAN

Top 2 architecture



Bidirectional GAN

Paper Title: ADVERSARIAL FEATURE LEARNING

Conference: ICLR 2017

Authors: Jeff Donahue, Philipp Krähenbühl, Trevor Darrell

Github: https://github.com/WilliBee/bigan_SRL

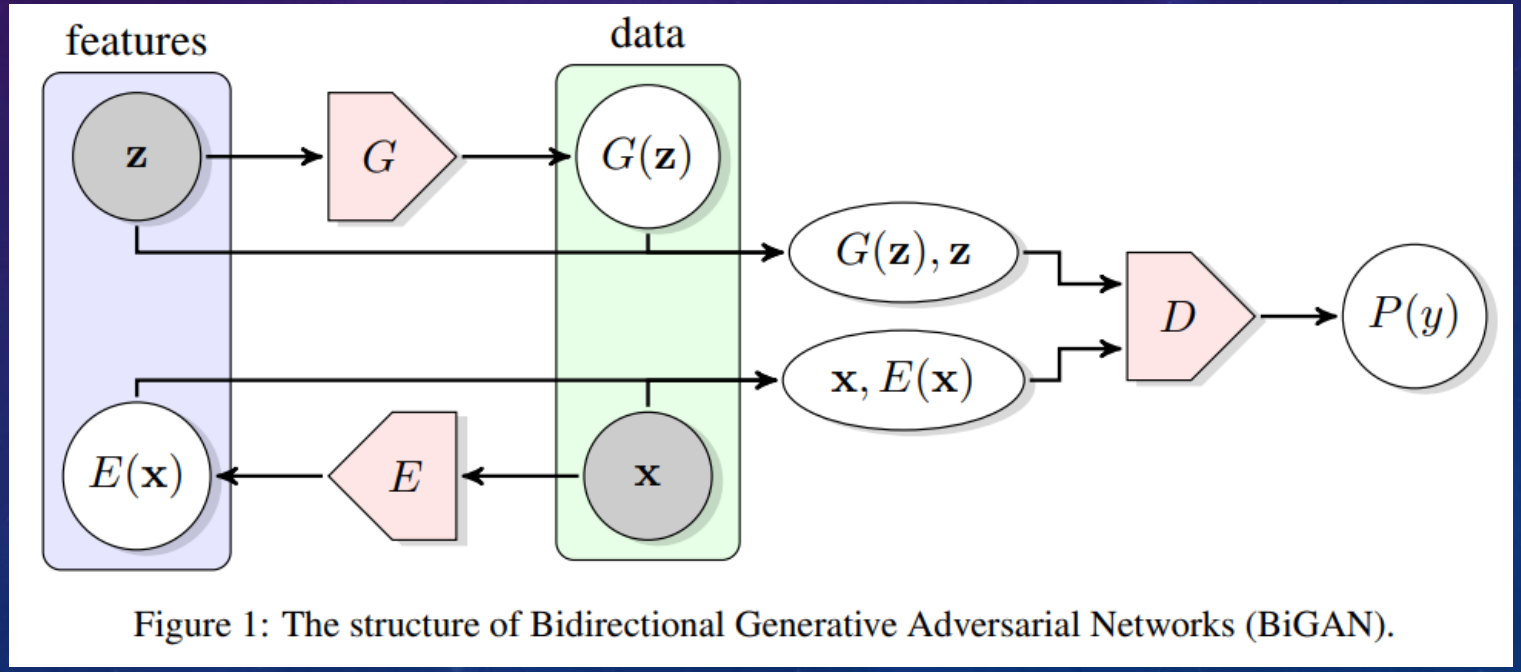


Figure 1: The structure of Bidirectional Generative Adversarial Networks (BiGAN).

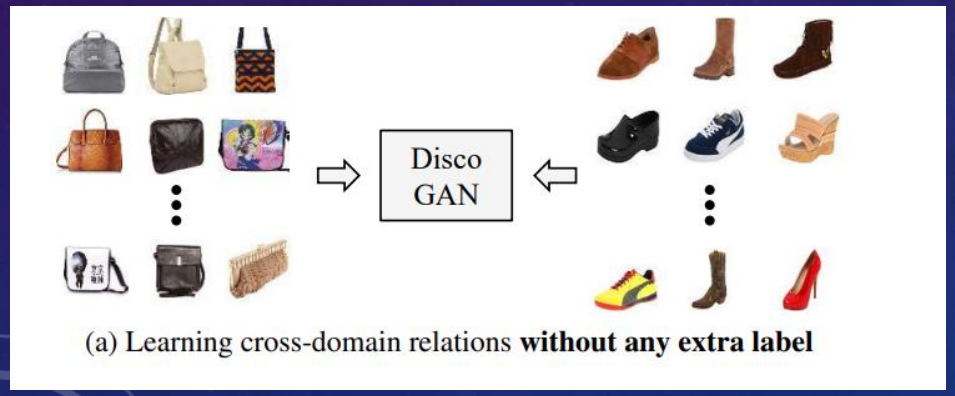
DiscoGAN

Paper Title: Learning to Discover Cross-Domain Relations with Generative Adversarial Networks

Conference: ICML 2017

Authors: Taeksoo Kim, Moonsu Cha, Hyunsoo Kim, Jung Kwon Lee, Jiwon Kim

Github: https://github.com/carpedm20/DiscoGAN-pytorch



(a) Learning cross-domain relations **without any extra label**

(b) Handbag images (input) & **Generated** shoe images (output)

Sketch → Color

Segmentation → Image

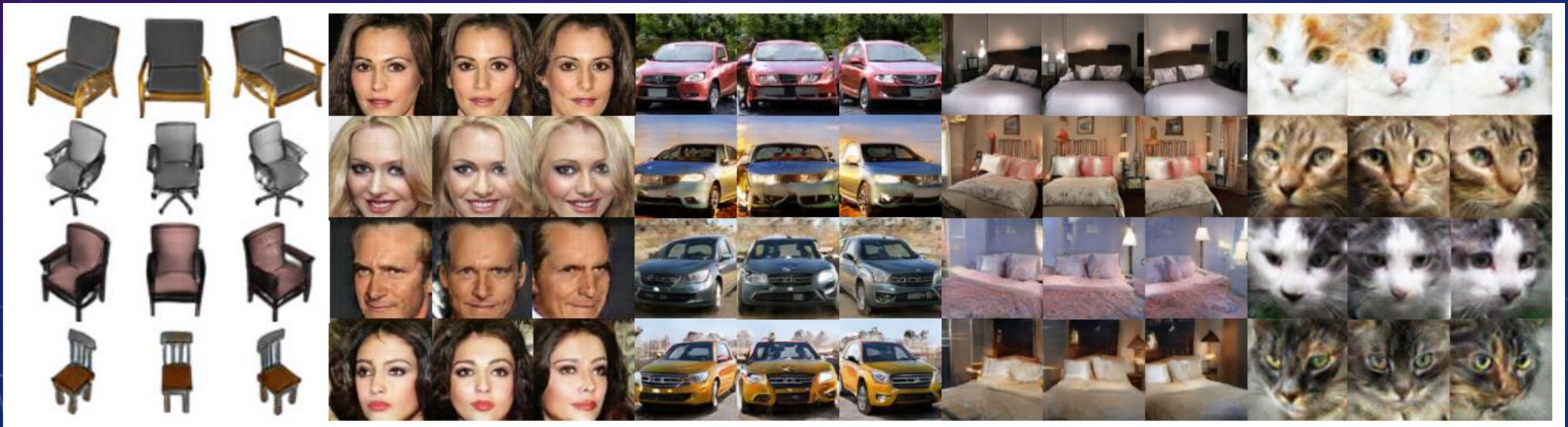
HoloGAN

Paper Title: HoloGAN: Unsupervised Learning of 3D Representations From Natural Images

Conference: ICCV 2019

Authors: Nguyen-Phuoc, Thu and Li, Chuan and Theis, Lucas and Richardt, Christian and Yang, Yong-Liang

Github: https://github.com/thunguyenphuoc/HoloGAN



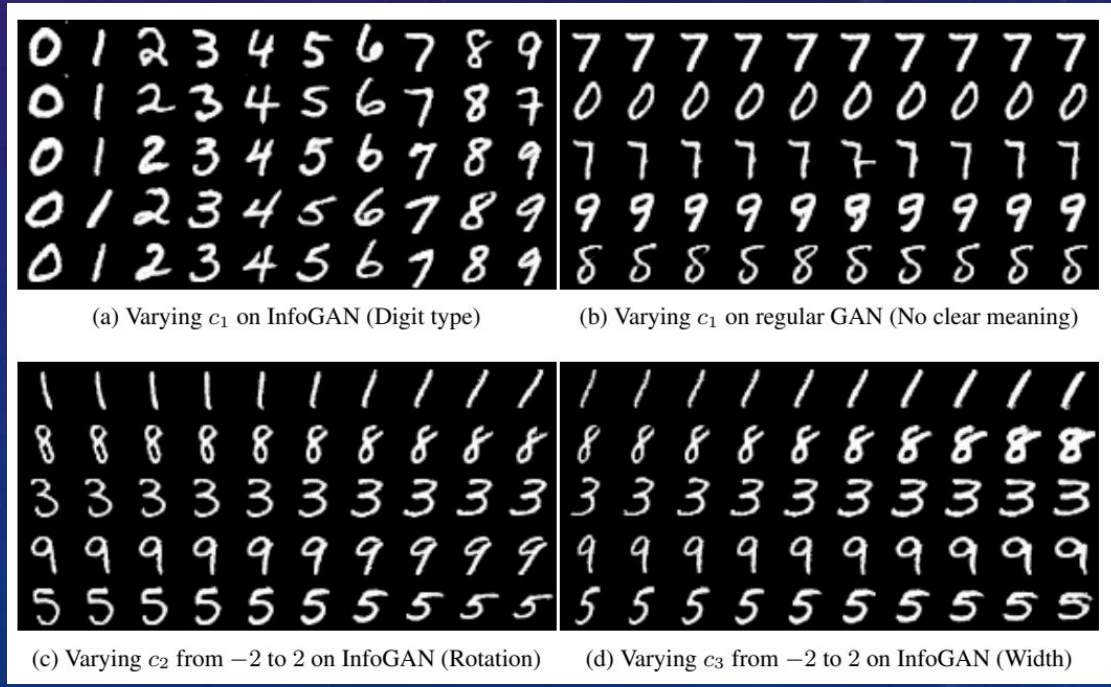
InfoGAN

Paper Title: InfoGAN: Interpretable Representation Learning by Information Maximizing Generative Adversarial Nets

Conference: NIPS 2016

Authors: Xi Chen, Yan Duan, Rein Houthooft, John Schulman, Ilya Sutskever, Pieter Abbeel

Github: https://github.com/openai/InfoGAN



(a) Varying c_1 on InfoGAN (Digit type)

(b) Varying c_1 on regular GAN (No clear meaning)

(c) Varying c_2 from -2 to 2 on InfoGAN (Rotation)

(d) Varying c_3 from -2 to 2 on InfoGAN (Width)

Example: Manipulating Latent Code of MNIST dataset

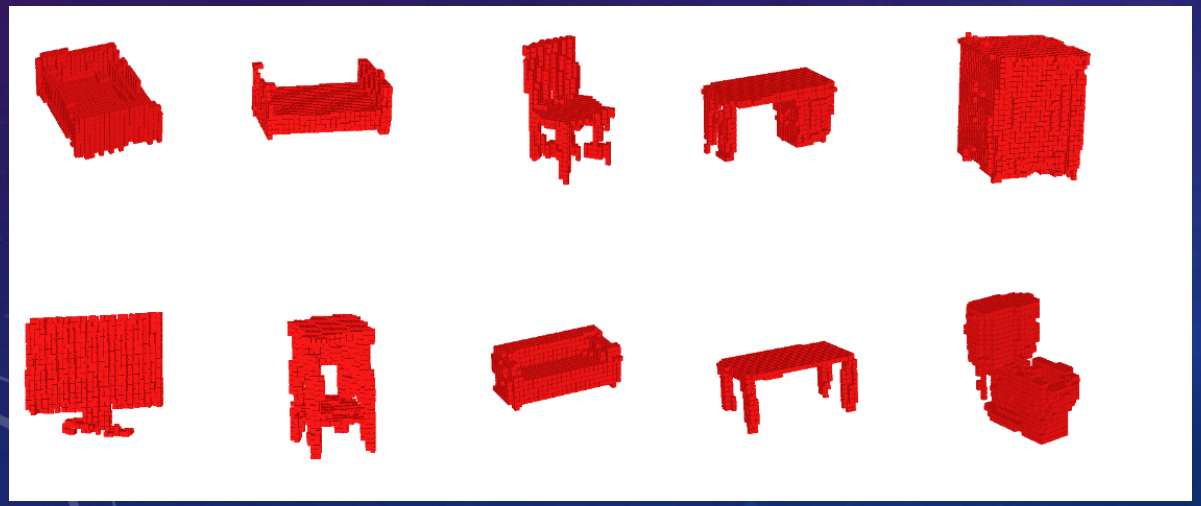
3D IWGAN

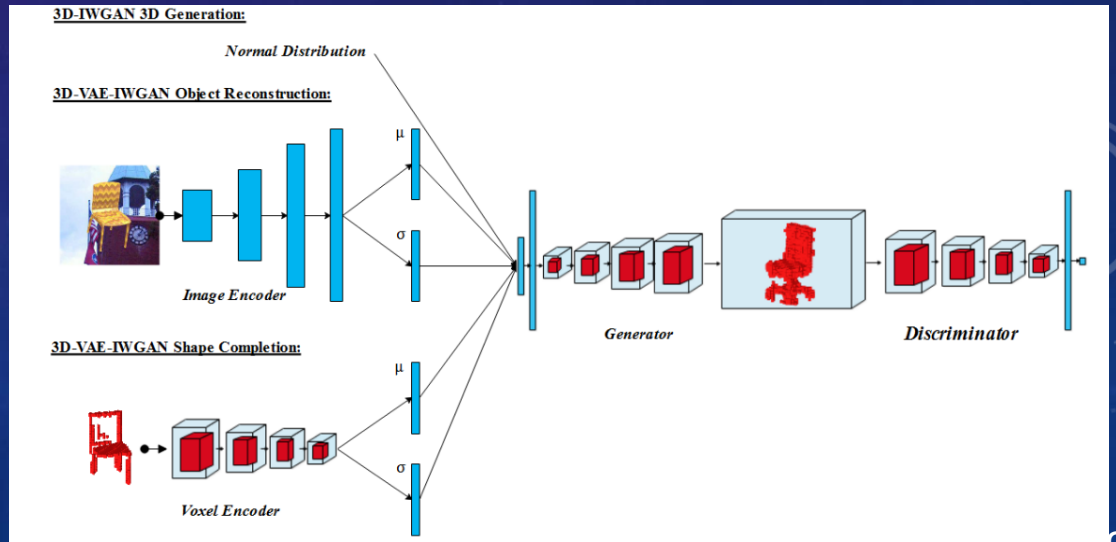
Paper Title: Improved Adversarial Systems for 3D Object Generation and Reconstruction

Conference: PMLR 2017

Authors: Edward Smith, David Meger

Github: https://github.com/EdwardSmith1884/3D-IWGAN





A diagram outlining the 3 Generative Adverserial Networks used in this repo.

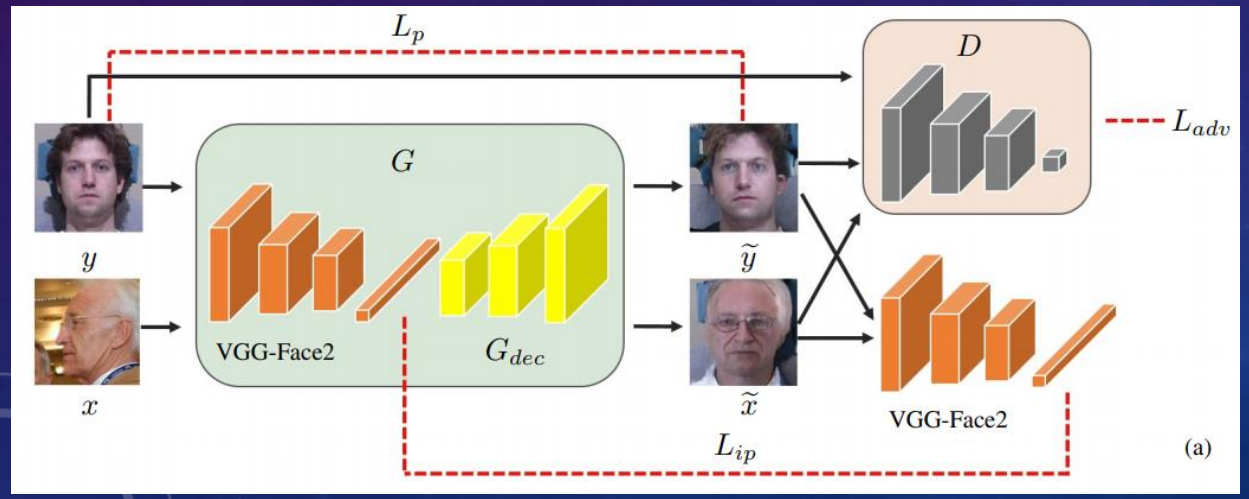
Face Normalization Model

Paper Title: Unsupervised Face Normalization with Extreme Pose and Expression in the Wild

Conference: CVPR 2019

Authors: Yichen Qian, Jiani Hu, Weihong Deng

Github: https://github.com/mx54039q/fnm



Generative Image Inpainting

Paper Title: Generative Image Inpainting with Contextual Attention

Conference: CVPR 2018

Authors: Jiahui Yu, Zhe Lin, Jimei Yang, Xiaohui Shen, Xin Lu, Thomas S. Huang

Github: https://github.com/Abhinandan11/generative-image-inpainting

Group project expectations

- Implement the codes on the GitHub and reproduce the paper results
- Alter the Network Architecture in a way and observe the change in the results. For example you can change properties of some Layers in the Network
- Record your results and present it to the class members. Everyone in the class must be able to understand what you did, so you need to explain important details as follows:
  - Novelties of the presented approach
  - Network architecture
  - Objective Functions
  - Dataset (both training and test sets)