Multi-Domain Image-to-Image Translation with Adaptive Inference Graph

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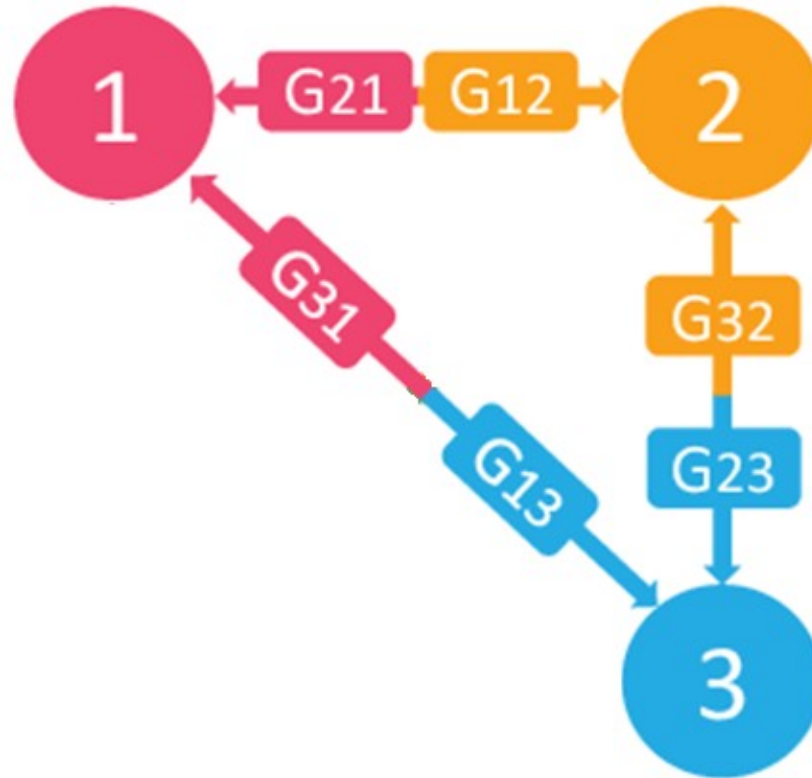University of Trento, Italia

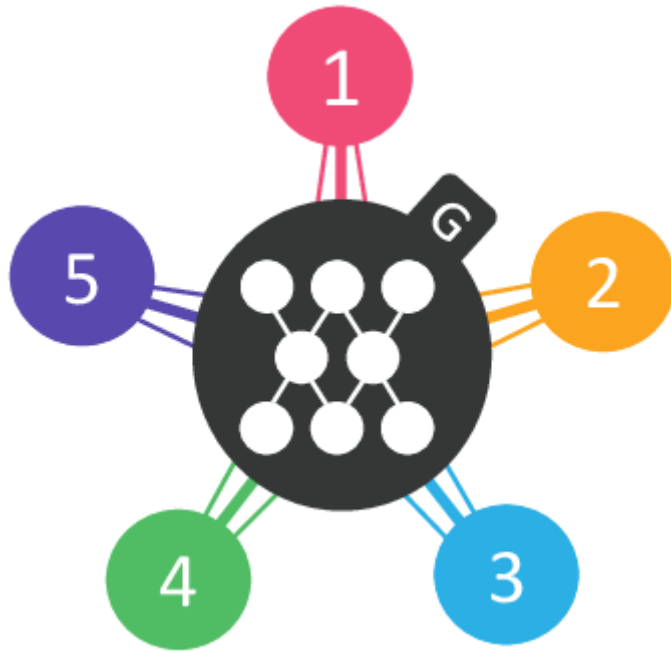# Multi-Domain Translation Problem

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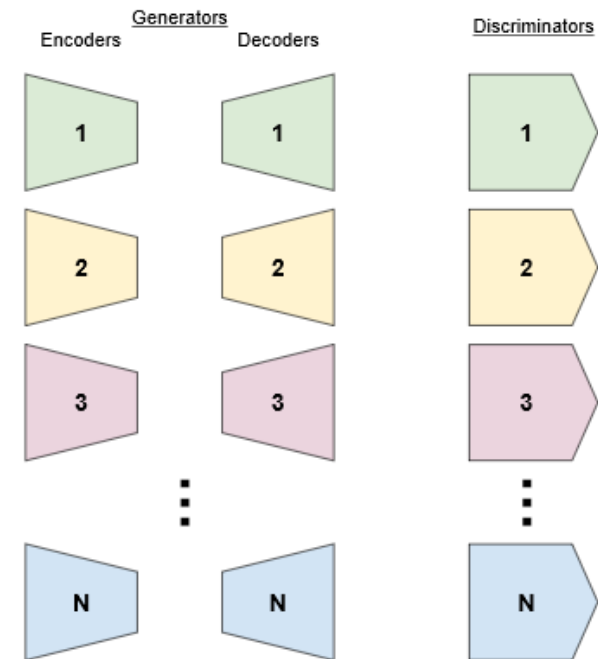Y. Choi, et al. "Stargan: Unified generative adversarial networks for multidomain image-to-image translation," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition,, 2018.

Existing Solutions

STARGAN

COMBOGAN

Y. Choi, et al. "Stargan: Unified generative adversarial networks for multidomain image-to-image translation," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition,, 2018.

Anoosheh, et al. "Combogan: Unrestrained scalability forimage domain translation," in CVPR Workshop, 2018.
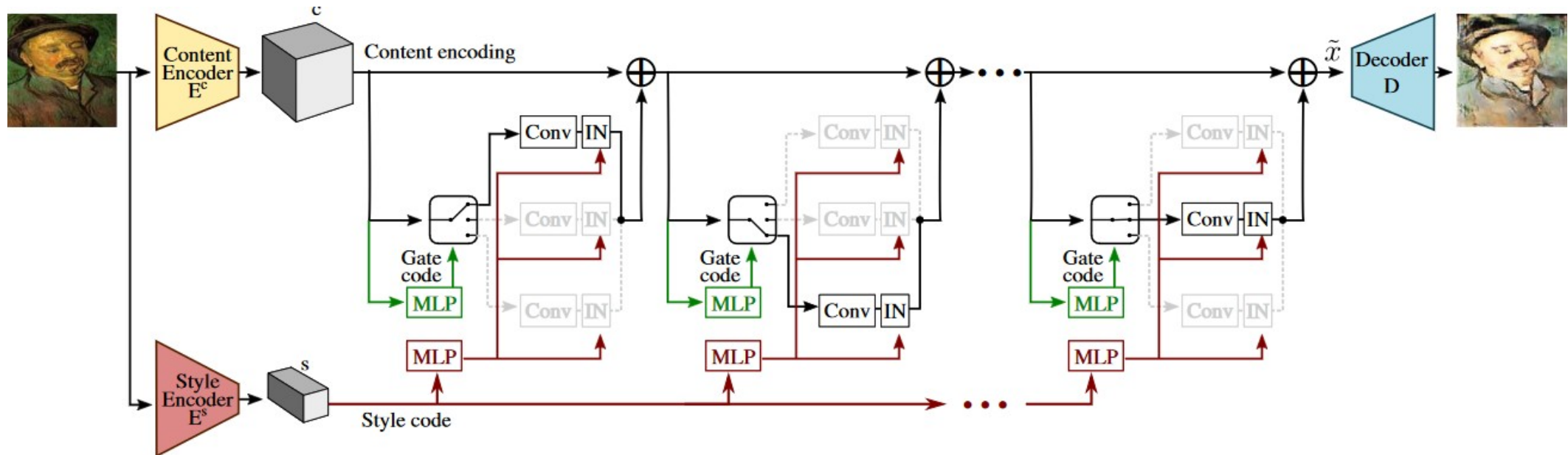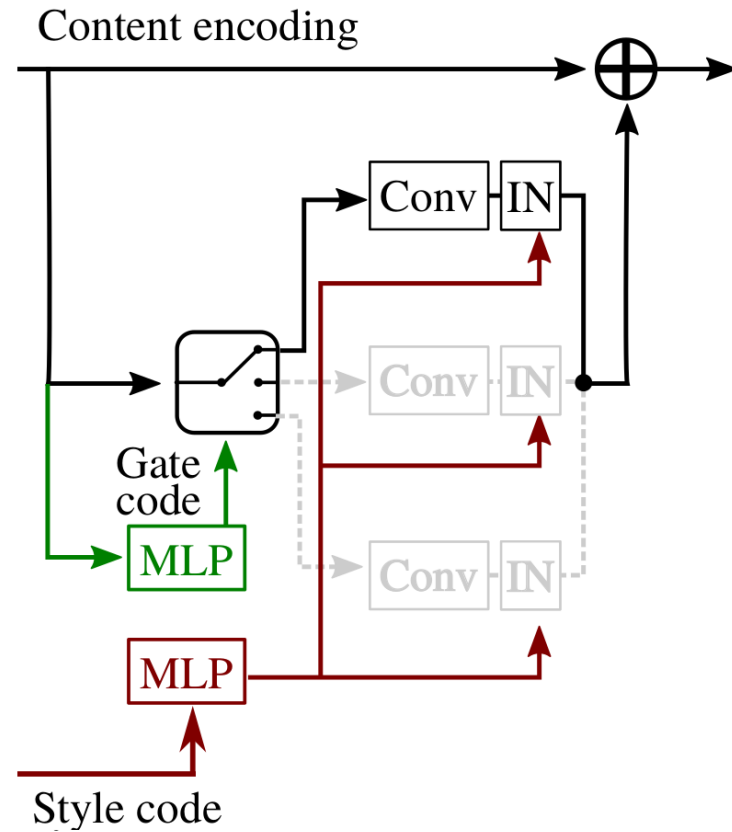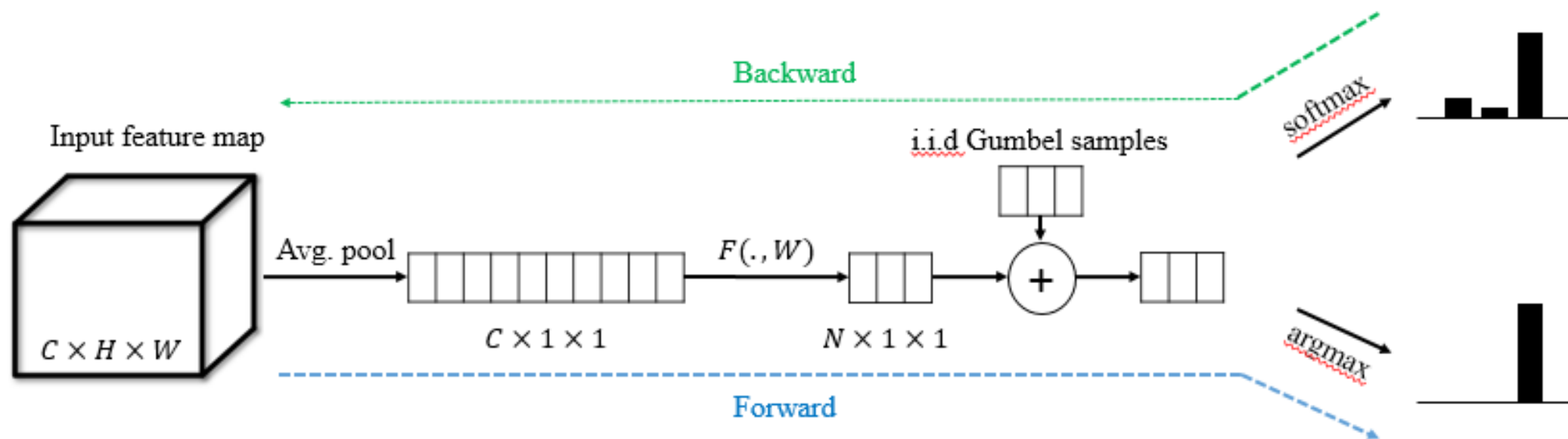
Ada^2Net

Adaptive Style-based Residual Block

Gating Unit

Qualitative Result

Quantitative Result

Artist	ComboGAN	StarGAN	$Ada^2 Net$
Beksinski	179.05	146.05	**111.5**
Boudin	160.3	148.54	**107.07**
Burliuk	142.84	136.57	**105.16**
Cezanne	146.44	129.98	**92.28**
Chagall	142.66	109.96	**102.43**
Corot	173.73	165.66	**106.37**
Earle	178.68	172.73	**147.95**
Gauguin	149.87	141.56	**98.51**
Hassam	140.98	141.24	**98.49**
Levitan	151.83	186.92	**112.44**
Monet	144.96	131.48	**78.81**
Picasso	145.1	134.1	**123.69**
Ukiyo-e	151.81	110.22	**99.97**
Van Gogh	151.91	135.45	**97.25**
Average±Std	154.3±12.91	142.18±20.72	**105.85±15.38**

Ablation Studies

Target Domain	Beksinski	Boudin	Burliuk	Cezanne	Chagall	Corot	Earle	Gauguin	Hassam	Levitan	Monet	Picasso	Ukiyo-e	Van Gogh

Original image

No-AdaGraph

Ada^2 Net-label

Ada^2 Net

Ablation Studies

Target Domain	Black Hair	Blonde Hair	Brown Hair	Gender	Age

Original image

No-AdaGraph

Ada^2 Net-label

Ada^2 Net
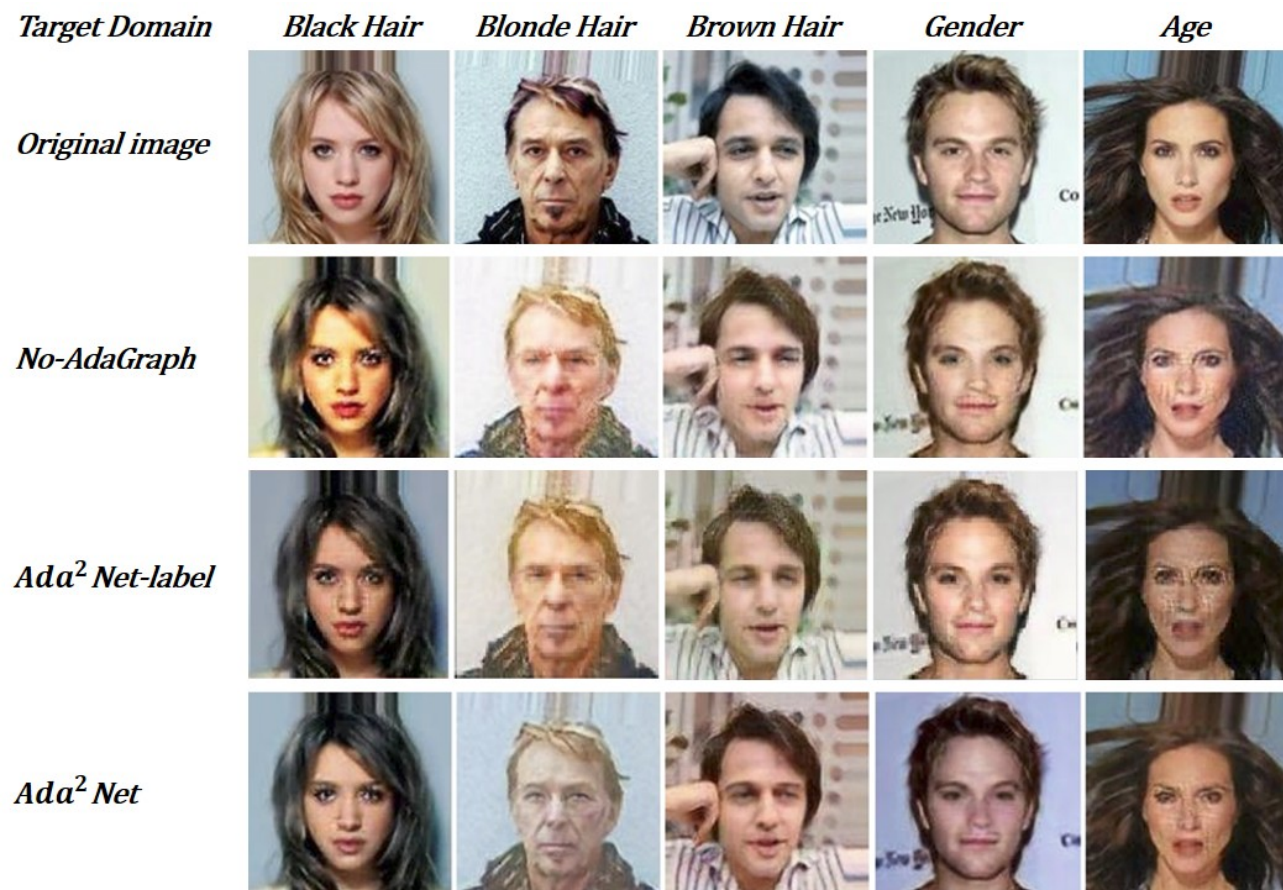
Conclusion

- We propose a network with an architecture that is dynamically chosen at inference time.

- We impose a constant computation complexity by selecting specific sub-networks at inference time.

- Evaluation is performed on two widely used datasets of facial and painting images and shows that our method outperforms other approaches.