# High-Resolution Image Synthesis with Latent Diffusion Models

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# Contents

# The Development of AI-Generated Content (AIGC)

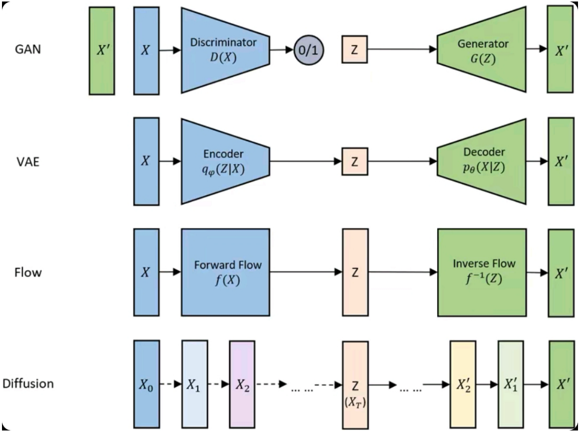


Figure 1: The development of AIGC and mobile edge computing network [1].

[1] M. Xu, et al., "Unleashing the power of edge-cloud generative AI in mobile networks: A survey of AIGC services," IEEE Commun. Surv. Tutor., Early Access, 2024.

# Diffusion Model

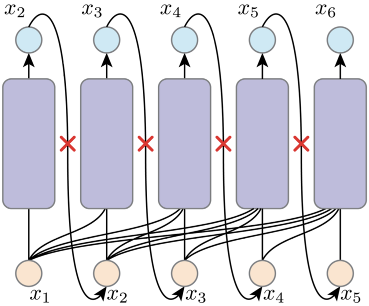


Figure 2: An illustration of diffusion model [2].

- With Gaussian noise as input
- The quality of generated images gets progressively better.

[2] H. Du, et al., "Enhancing deep reinforcement learning: A tutorial on generative diffusion models in network optimization," arXiv preprint arXiv:2308.05384, 2023.

# AIGC in Mobile Edge Computing (MEC)

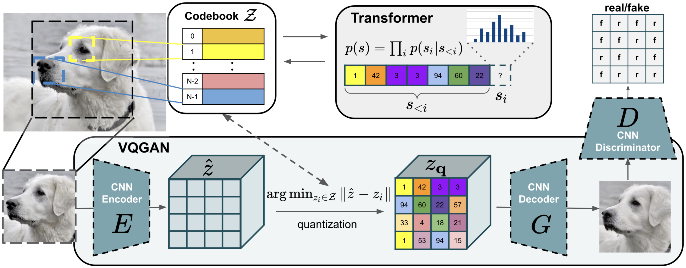


Figure 3: An overview of a mobile AIGC network [1].

- AIGC models can be deployed at edge servers.

[1] M. Xu, et al., "Unleashing the power of edge-cloud generative AI in mobile networks: A survey of AIGC services," IEEE Commun. Surv. Tutor., Early Access, 2024.

# MEC Network

# Local Processing Model

# Home BS Processing Model

# Neighbor BS Processing Model

# Weighted Cost

# Offloading Problem

# Deep Reinforcement Learning based OSI Algorithm

- State:

$$\mathrm{s}_{\mathrm{n}}^{(\mathrm{l})} = \left(\mathrm{B}_{\mathrm{n}}^{(\mathrm{l})}, \mathrm{q}_{\mathrm{n}}^{(\mathrm{l})}, \mathrm{f}_{\mathrm{n}}^{\mathrm{U},(\mathrm{l})}, \mathrm{g}^{\mathrm{B},(\mathrm{l})}, \mathrm{h}_{\mathrm{n}}^{(\mathrm{l})}\right)$$

- Action:

$$\mathrm{a}_{\mathrm{n}}^{(\mathrm{l})} = \left(\mathrm{x}_{\mathrm{n}}^{(\mathrm{l})}, \mathrm{y}_{\mathrm{n}}^{(\mathrm{l})}, \mathrm{c}_{\mathrm{n}}^{(\mathrm{l})}\right)$$

- Reward:

$$\mathrm{r}_{\mathrm{n}}^{(\mathrm{l})} = -\sum_{\mathrm{n}\in\mathcal{N}} \left(\omega_1 \mathrm{T}_{\mathrm{n}}^{(\mathrm{l})} + \omega_2 \mathrm{E}_{\mathrm{n}}^{(\mathrm{l})} + \omega_3 \epsilon_{\mathrm{n}}^{(\mathrm{l})}\right) - \mathrm{r}_{\mathrm{n}}^{\mathrm{P},(\mathrm{l})}$$

- Conclusion 1.
- Conclusion 2.
- Conclusion 3.
- Conclusion 4.

# Acknowledgements

Thanks for your listening!

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