

# 電機資訊學院 2025 實作專題競賽

## Real-Time Chatroom Sticker Generation with Image Generative AI 影像生成式 AI 於聊天室貼圖即時生成應用

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### Abstract

People use "stickers" during online chatting to convey emotions. However, they often face the challenge of not finding a sticker that fully meets their expressive needs. To address this, we developed an image generative model tailored to create chatroom stickers. Using the open-source model SDXL-Turbo as a foundation, we trained the model through Low-Rank Adaptation (LoRA) and LoRA fusion. Currently, our model can generate stickers with unique styles and a wide range of expressions. Additionally, an online chatroom has been implemented to demonstrate the model's capabilities.

### Motivation and Purpose

I want to tell my friends I'm so nervous!



✗ I don't want to use this one.

✗ This looks sleepy, not nervous.

✗ This otter is cute, but I'm nervous not happy.

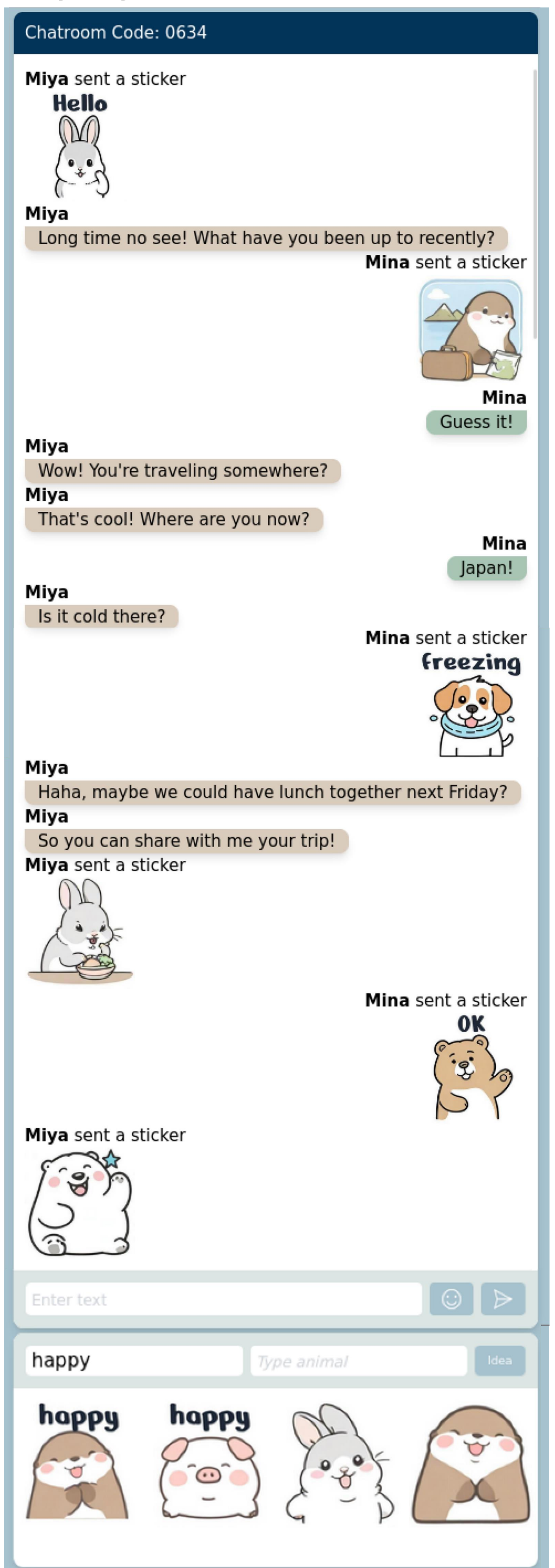
### Generate on your own

1. Pick the genre you like
2. Train SDXL-Turbo with LoRA
3. Stickers that fulfill your needs are generated!!



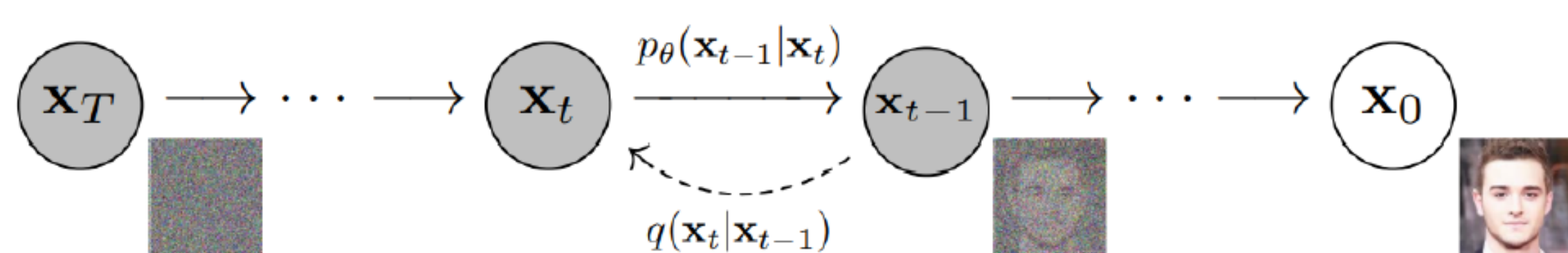
### Chatroom DEMO

We developed a chatroom to show how the stickers generated by our model can be applied in everyday life.



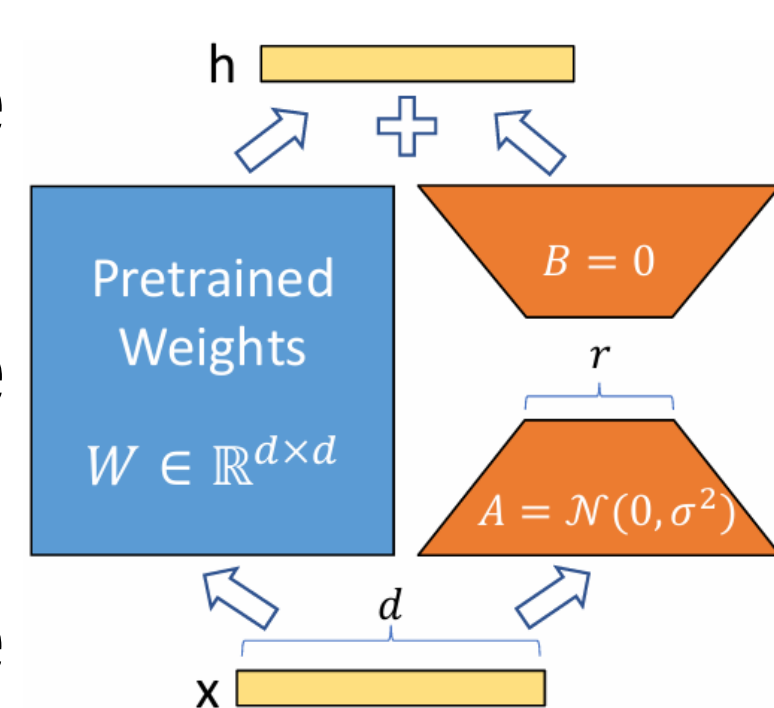
### Diffusion Model

Diffusion models have gained significant popularity in recent years for high-quality image synthesis that often surpass GAN. These models generate images by defining **Markov chain** that progressively adds noise to data and then learns to reverse the process,  $p_{\theta}(x_{t-1}|x_t)$ , as illustrated in the figure<sup>[1]</sup> below. **SDXL-Turbo**<sup>[2]</sup> is based on Adversarial Diffusion Distillation (ADD), which is initially trained for **real-time** image synthesis, and we fine-tune it for chatroom sticker generation.



### Low-Rank Adaptation (LoRA)<sup>[3]</sup>

Since SDXL-Turbo has billions of parameters, fine-tuning the entire model is impractical. Therefore, we adopt LoRA, which reduces the number of trainable parameters, thus decreasing both training time and computational load.



### Experimental Results

#### Examples of Training Dataset (LINE Stickers)



#### Results Before Training (SDXL-Turbo) vs After Training (Our Model)

Prompt: laughing, otter, dm-sticker



Prompt: let's go, otter, dm-sticker



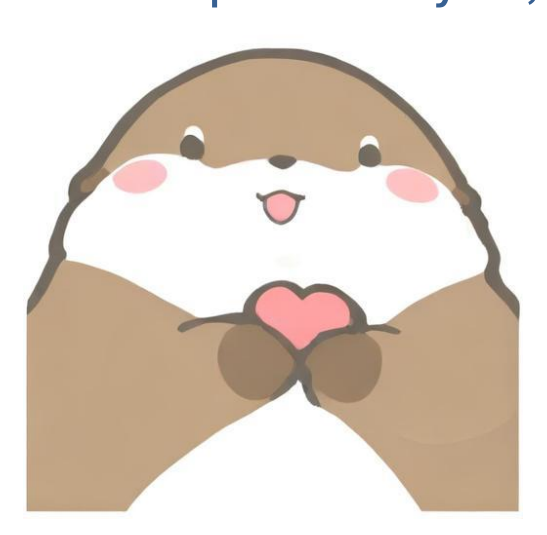
#### Daily use of generated stickers

Prompt: eating, otter, dm-sticker



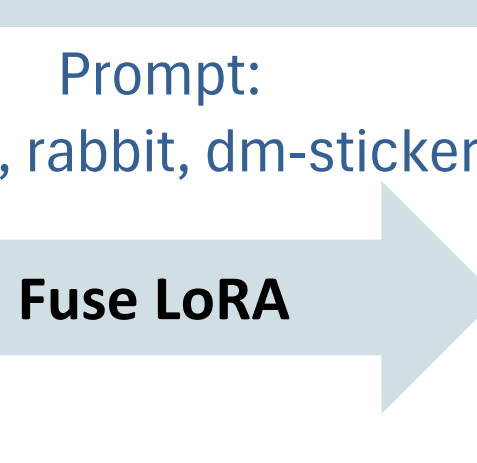
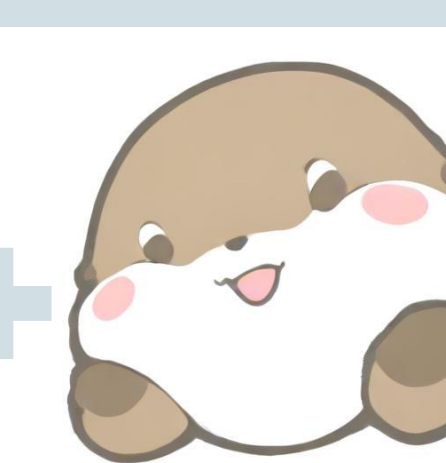
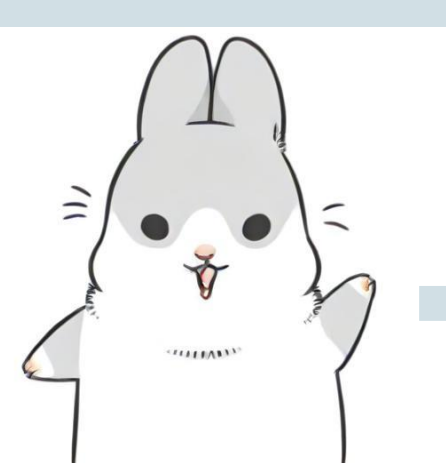
#### Diversity of generated stickers

Prompt: I love you, otter, dm-sticker



#### Fuse LoRA

Prompt: happy, rabbit, dm-sticker



### Conclusion

With social media playing a significant role in daily life, sticker creation with image generation models is a promising area for future exploration. Our model has already shown potential to revolutionize online chatting experience by providing vivid and diverse stickers that meet users' needs.

### Demo Video

