#### Siddharth Mishra-Sharma (MIT/IAIFI) | IAIFI Summer School



## Diffusion models: overview

# $x_{t-1} \sim p(x_{t-1} \mid x_t)$ Reverse process (denoising)



image  $\sim p(\text{image} \mid \text{text prompt})$ 

Prompt: "A cat perched on an Ikea Poang chair"

### Forward process (adding noise)

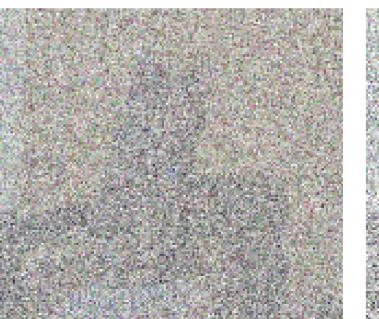
$$x(t=1) \sim \mathcal{N}(0,1)$$

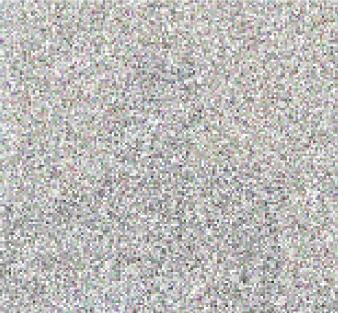












#### $x(t=0) \sim p(x)$



## Diffusion models: overview

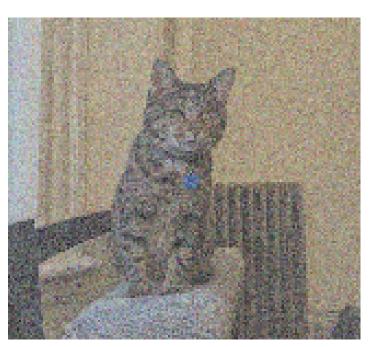
#### Forward process (adding noise)

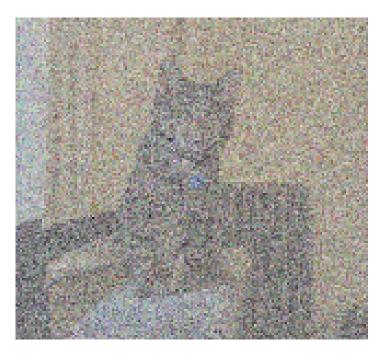
$$x(t=0) \sim p(x)$$

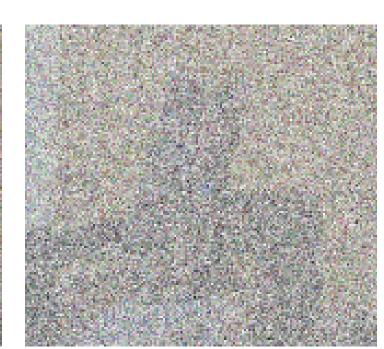
$$x(t=1) \sim \mathcal{N}(0,1)$$

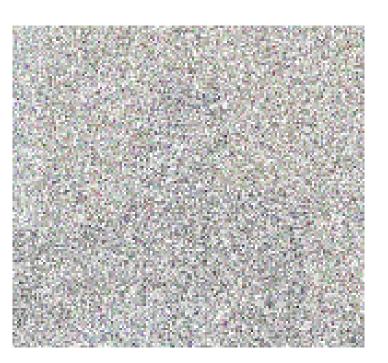




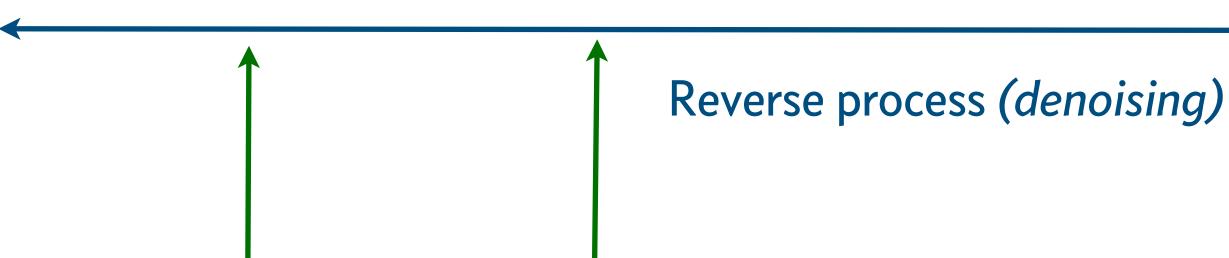








$$x_{t-1} \sim p(x_{t-1} \mid x_t)$$



Prompt: "A cat perched on an Ikea Poang chair"

image  $\sim p$  (image | text prompt)

## Towards diffusion: hierarchical VAEs

