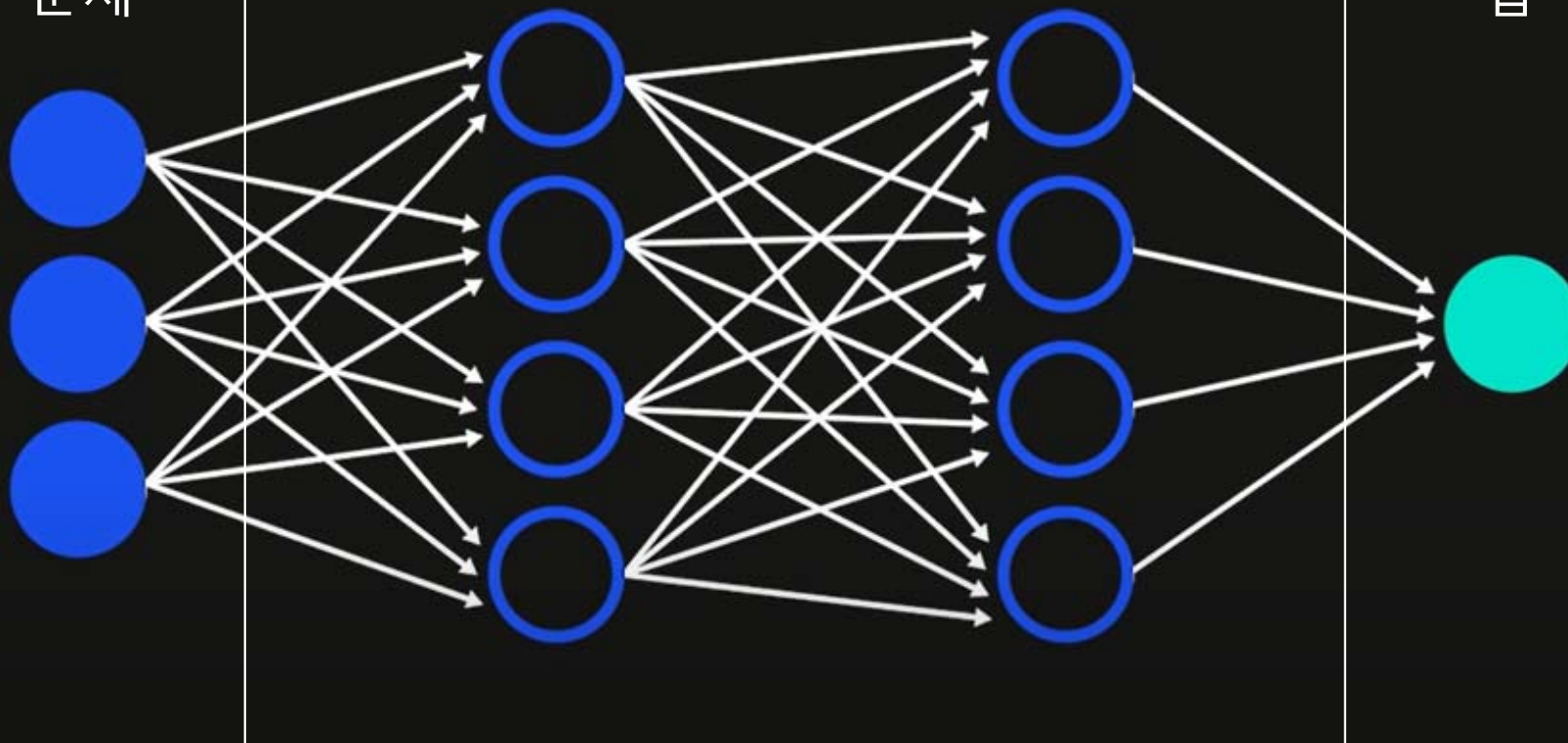


Stable Diffusion

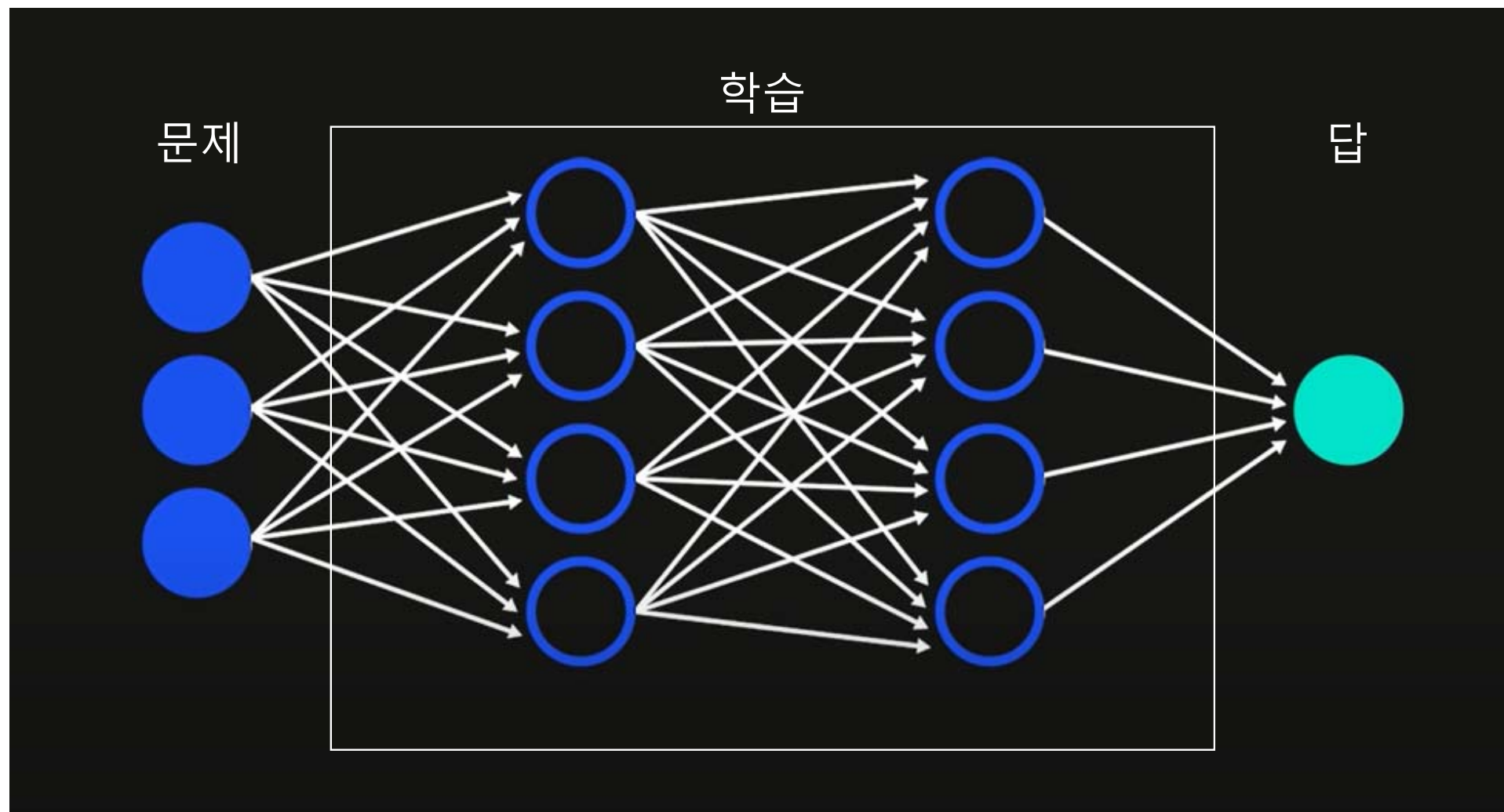
문제

답 맞추는 알고리즘을 만들어라

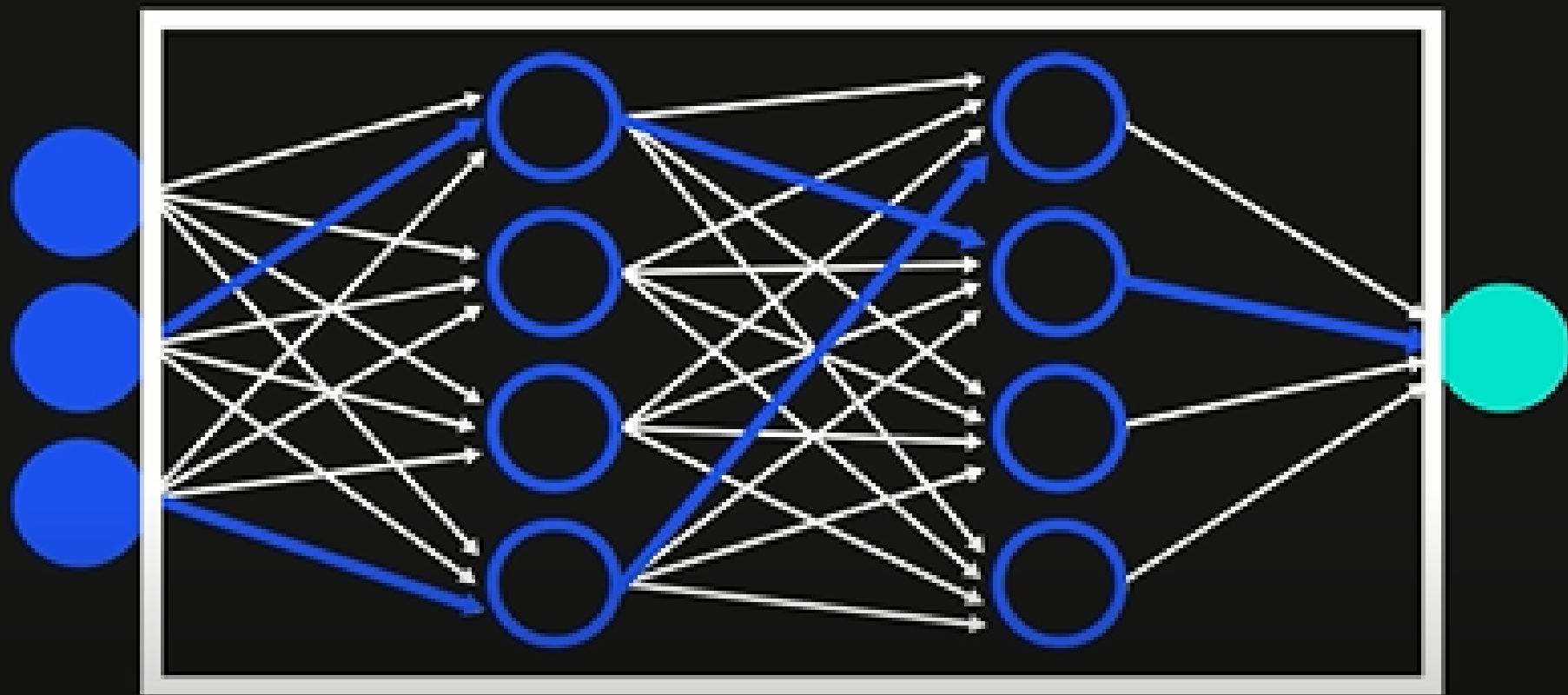
답



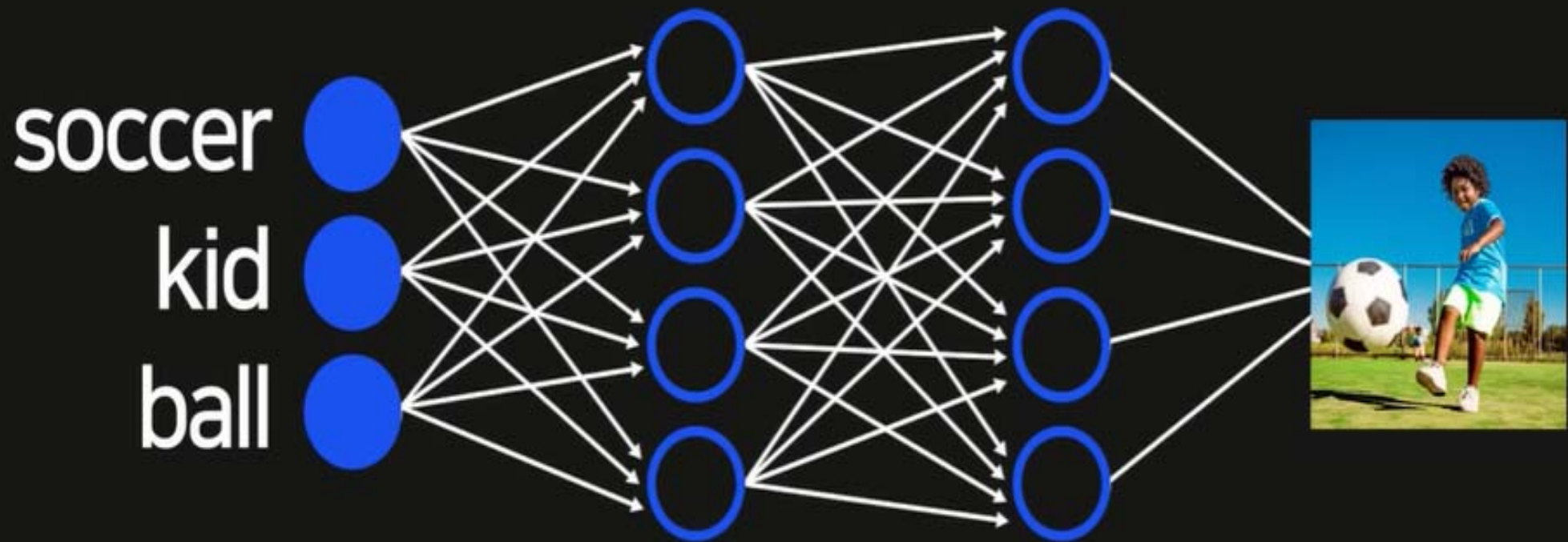
인공지능??



시 완성



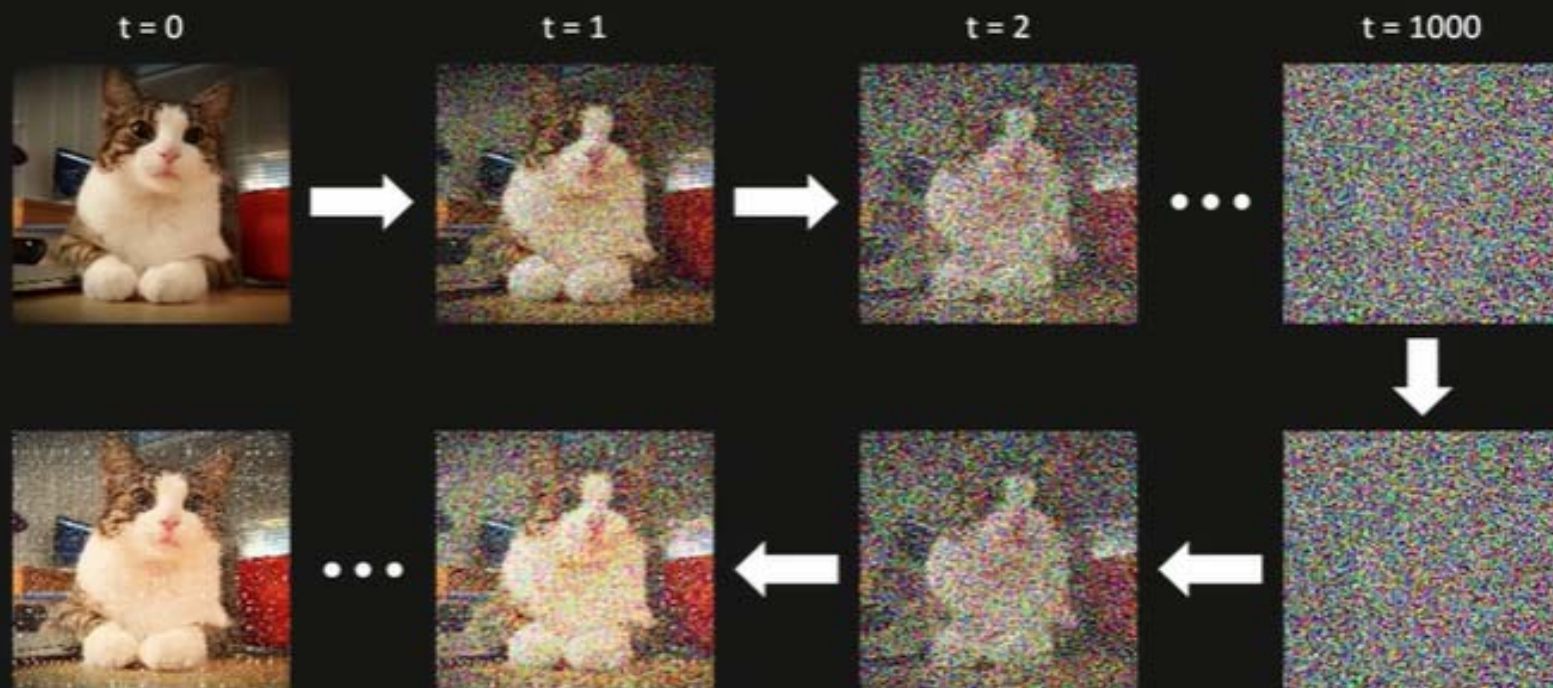
이미지 생성 AI 만들고 싶으면?



Diffusion Model

사진에 노이즈를 더함

노이즈를 100번 정도 적용



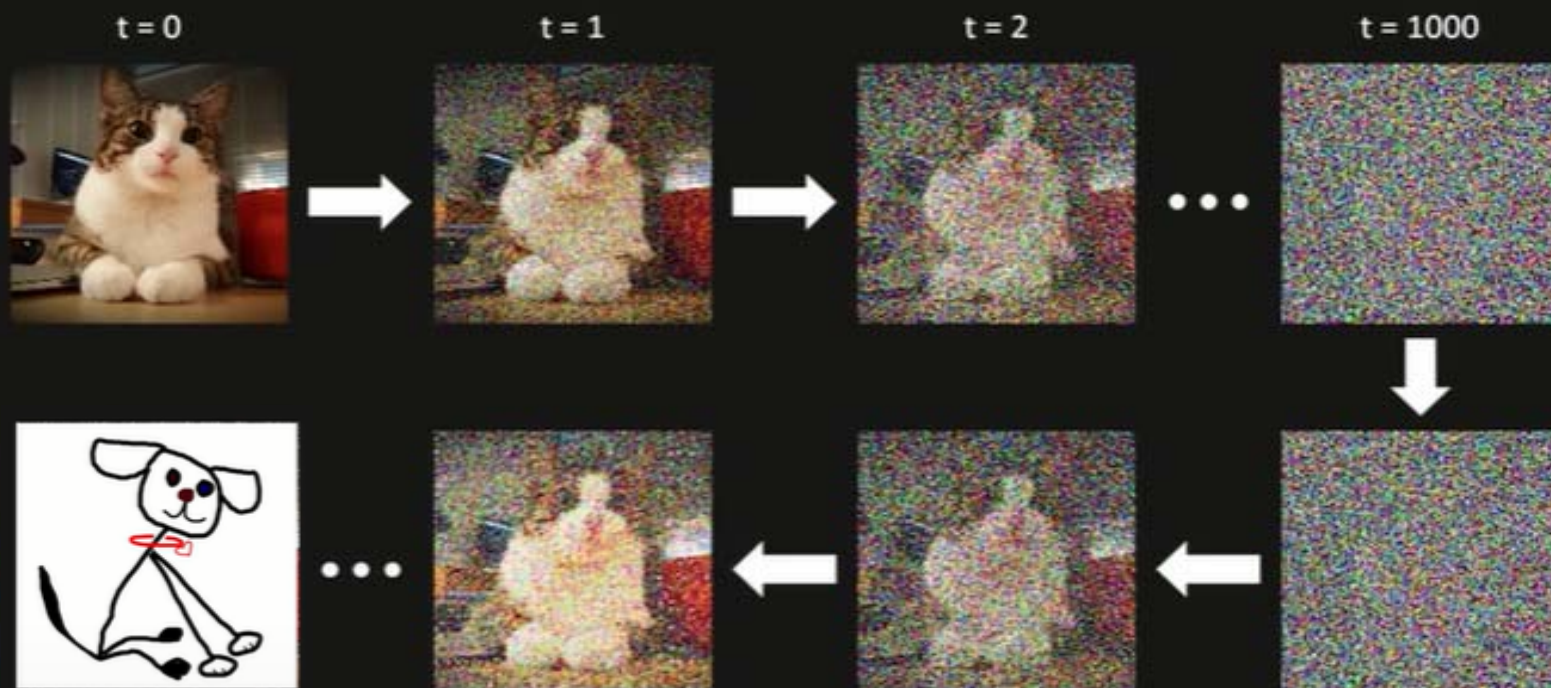
노이즈를 제거해서 다시 사진으로 만들

노이즈 제거

Diffusion Model

사진에 노이즈를 더함

노이즈를 100번 정도 적용



처음 학습할 때는 안좋은 결과를 생성함

노이즈 제거

Diffusion Model

사진에 노이즈를 더함

노이즈를 100번 정도 적용

t=0



t=1



t=2



...

t=1000



학습시간이 오래 걸림



...



좋은 이미지에 높은 점수를 주고,
학습을 반복하면 좋은 이미지를 생성

노이즈 제거

새로운 알고리즘 개발

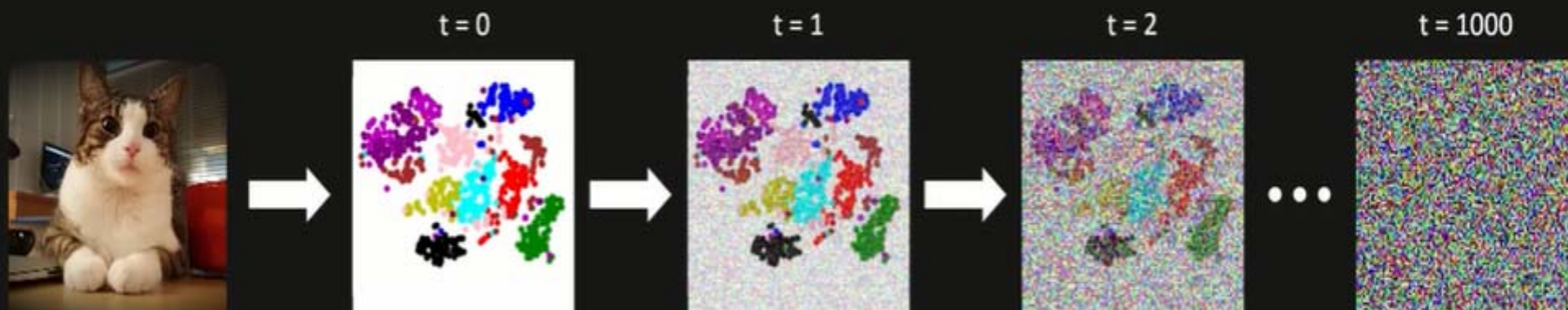


Latent Diffusion Model

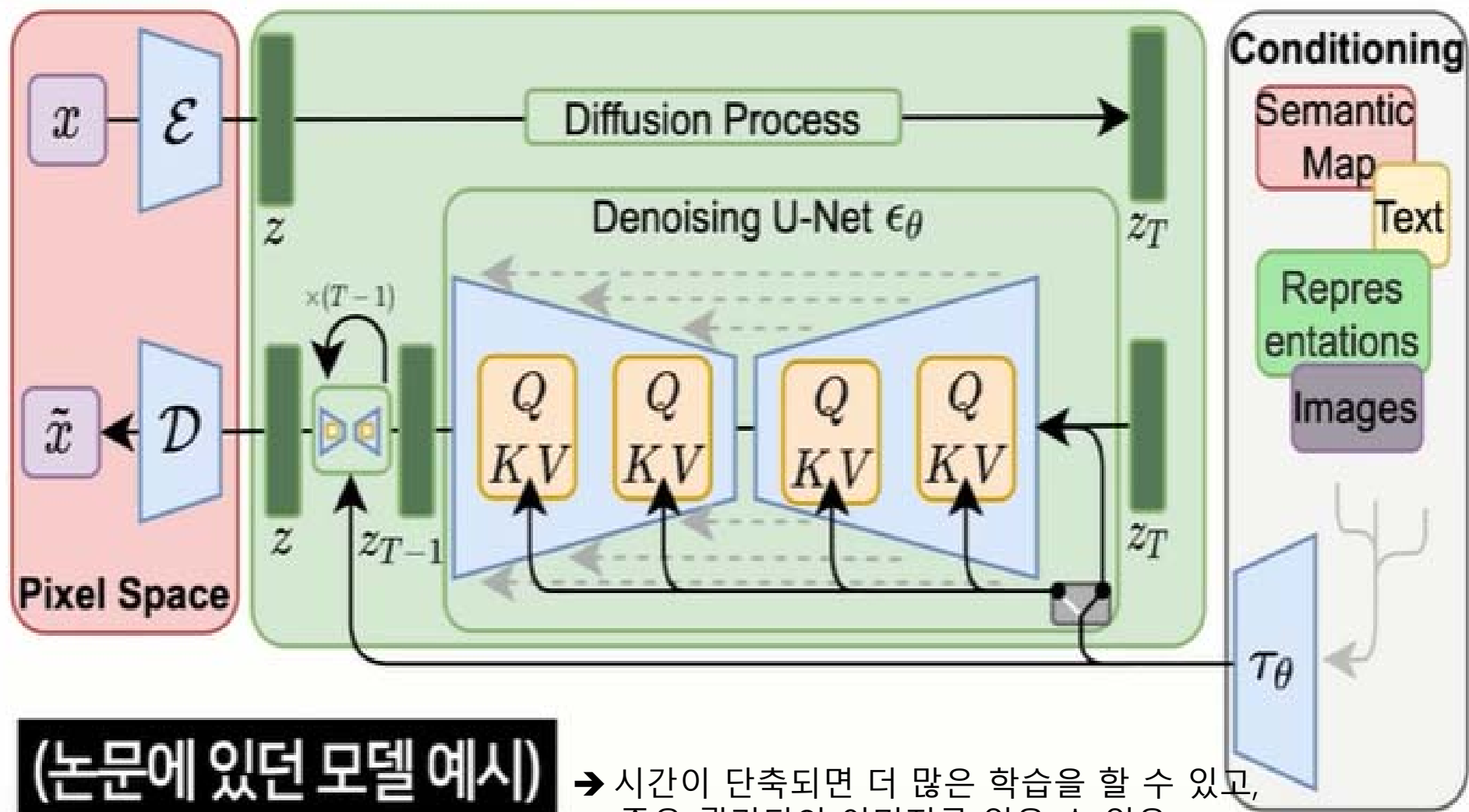
그냥 Diffusion Model

← 학습 오래걸리고 비용 높음

Latent Diffusion Model



이미지를 인코딩하고
행렬 데이터로 변환하면
연산시간이 단축됨



(논문에 있던 모델 예시)

- 시간이 단축되면 더 많은 학습을 할 수 있고, 좋은 퀄리티의 이미지를 얻을 수 있음
- 가격 경쟁력이 올라감

실 습

Wed Nov 2 11:47:12 2022

NVIDIA-SMI 512.15				Driver Version: 512.15		CUDA Version: 11.6	
GPU	Name	TCC/WDDM	Bus-Id	Disp.A	Volatile Uncorr. ECC		
Fan	Temp	Perf	Pwr:Usage/Cap	Memory-Usage	GPU-Util	Compute M.	MIG M.
0	NVIDIA GeForce ...	WDDM	00000000:01:00.0	On		N/A	
30%	26C	P8	1W / 38W	132MiB / 1024MiB	7%	Default	N/A
Processes:							
GPU	GI	CI	PID	Type	Process name	GPU Memory	
	ID	ID				Usage	
0	N/A	N/A	1436	C+G	C:\Windows\System32\cmd.exe	N/A	

```
(base) PS C:\Users\msjang> pip install --upgrade keras-cv
```

```
Collecting keras-cv
```

```
  Downloading keras_cv-0.3.4-py3-none-any.whl (394 kB)
```

```
    |████████████████████| 394 kB 6.4 MB/s
```

```
Requirement already satisfied: packaging in g:\anaconda3\lib\site-packages (from keras-cv) (21.3)
```

```
Collecting absl-py
```

```
  Downloading absl_py-1.3.0-py3-none-any.whl (124 kB)
```

```
    |████████████████████| 124 kB 6.8 MB/s
```

```
Requirement already satisfied: regex in g:\anaconda3\lib\site-packages (from keras-cv) (2022.3.15)
```

```
Requirement already satisfied: pyparsing<3.0.5,>=2.0.2 in g:\anaconda3\lib\site-packages (from packaging->keras-cv) (3.0.4)
```

```
Installing collected packages: absl-py, keras-cv
```

```
Successfully installed absl-py-1.3.0 keras-cv-0.3.4
```

```
(base) PS C:\Users\msjang> _
```

In [1]:

```
1 import time
2 import keras_cv
```

ModuleNotFoundError

Traceback (most recent call last)

Input In [1], in <cell line: 2>():

```
1 import time
----> 2 import keras_cv
```

File g:\Anaconda3\lib\site-packages\keras_cv__init__.py:16, in <module>

```
1 # Copyright 2022 The KerasCV Authors
2 #
3 # Licensed under the Apache License, Version 2.0 (the "License");
4 (...)
14
15 # isort:off
----> 16 from keras_cv import version_check
18 version_check.check_tf_version()
19 # isort:on
```

File g:\Anaconda3\lib\site-packages\keras_cv\version_check.py:18, in <module>

```
1 # Copyright 2022 The KerasCV Authors
2 #
3 # Licensed under the Apache License, Version 2.0 (the "License");
4 (...)
12 # See the License for the specific language governing permissions and
13 # limitations under the License.
15 """KerasCV Version check."""
----> 18 import tensorflow as tf
19 from packaging.version import parse
21 MIN_VERSION = "2.9.0"
```

ModuleNotFoundError: No module named 'tensorflow'

```
(base) PS C:\Users\Wmsiang> pip install tensorflow
Collecting tensorflow
  Downloading tensorflow-2.10.0-cp39-cp39-win_amd64.whl (455.9 MB)
    | 455.9 MB 11 kB/s
Collecting tensorflow-io-gcs-filesystem>=0.23.1
  Downloading tensorflow-io-gcs-filesystem-0.27.0-cp39-cp39-win_amd64.whl (1.5 MB)
    | 1.5 MB 6.4 MB/s
Collecting tensorboard<2.11.>=2.10
  Downloading tensorboard-2.10.1-py3-none-any.whl (5.9 MB)
    | 5.9 MB ...
Requirement already satisfied: wrapt>=1.11.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.12.1)
Requirement already satisfied: packaging in g:\Wanaconda3\lib\site-packages (from tensorflow) (21.3)
Requirement already satisfied: absl-py>=1.0.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.3.0)
Collecting keras-preprocessing>=1.1.1
  Using cached Keras_Preprocessing-1.1.2-py2.py3-none-any.whl (42 kB)
Collecting keras<2.11.>=2.10.0
  Downloading keras-2.10.0-py2.py3-none-any.whl (1.7 MB)
    | 1.7 MB 6.8 MB/s
Collecting libclang>=13.0.0
  Downloading libclang-14.0.6-py2.py3-none-win_amd64.whl (14.2 MB)
    | 14.2 MB 6.4 MB/s
Collecting flatbuffers>=2.0
  Downloading flatbuffers-22.10.26-py2.py3-none-any.whl (26 kB)
Collecting astunparse>=1.6.0
  Using cached astunparse-1.6.3-py2.py3-none-any.whl (12 kB)
Collecting tensorflow-estimator<2.11.>=2.10.0
  Downloading tensorflow-estimator-2.10.0-py2.py3-none-any.whl (438 kB)
    | 438 kB 6.4 MB/s
Requirement already satisfied: grpcio<2.0.>=1.24.3 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.42.0)
Collecting termcolor>=1.1.0
  Downloading termcolor-2.1.0-py3-none-any.whl (5.8 kB)
Collecting google-pasta>=0.1.1
  Using cached google_pasta-0.2.0-py3-none-any.whl (57 kB)
Collecting gast<0.4.0.>=0.2.1
  Downloading gast-0.4.0-py3-none-any.whl (9.8 kB)
Requirement already satisfied: typing-extensions>=3.6.6 in g:\Wanaconda3\lib\site-packages (from tensorflow) (4.1.1)
Requirement already satisfied: numpy>=1.20 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.21.5)
Collecting opt-einsum>=2.3.2
  Using cached opt_einsum-3.3.0-py3-none-any.whl (65 kB)
Requirement already satisfied: six>=1.12.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.16.0)
Requirement already satisfied: h5py>=2.9.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (3.6.0)
Requirement already satisfied: protobuf<3.20.>=3.9.2 in g:\Wanaconda3\lib\site-packages (from tensorflow) (3.19.1)
Requirement already satisfied: astunparse in g:\Wanaconda3\lib\site-packages (from tensorflow) (61.2.0)
Requirement already satisfied: wheel<0.23.0 in g:\Wanaconda3\lib\site-packages (from astunparse==1.6.0->tensorflow) (0.37.1)
Collecting google-auth-oauthlib>=0.4.1
  Downloading google_auth_oauthlib-0.4.6-py2.py3-none-any.whl (18 kB)
Requirement already satisfied: requests<3.>=2.21.0 in g:\Wanaconda3\lib\site-packages (from google-auth-oauthlib==0.4.6->tensorflow) (2.27.1)
Collecting tensorboard-data-server<0.7.0.>=0.6.0
  Downloading tensorboard_data_server-0.6.1-py3-none-any.whl (2.4 kB)
Collecting tensorboard-plugin-wit>=1.6.0
  Downloading tensorboard-plugin-wit-1.8.1-py3-none-any.whl (781 kB)
    | 781 kB ...
Requirement already satisfied: markdown>=2.6.8 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11.>=2.10->tensorflow) (3.3.4)
Requirement already satisfied: werkzeug>=1.0.1 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11.>=2.10->tensorflow) (2.0.3)
Requirement already satisfied: google-auth<3.>=1.6.3 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11.>=2.10->tensorflow) (1.33.0)
Requirement already satisfied: cachetools<5.0.>=2.0.0 in g:\Wanaconda3\lib\site-packages (from google-auth<3.>=1.6.3->tensorboard<2.11.>=2.10->tensorflow) (4.2.2)
Requirement already satisfied: rsa<5.>=3.1.4 in g:\Wanaconda3\lib\site-packages (from google-auth<3.>=1.6.3->tensorboard<2.11.>=2.10->tensorflow) (4.7.2)
Requirement already satisfied: pyasn1-modules>=0.2.1 in g:\Wanaconda3\lib\site-packages (from google-auth<3.>=1.6.3->tensorboard<2.11.>=2.10->tensorflow) (0.2.8)
Collecting requests-oauthlib>=0.7.0
  Downloading requests_oauthlib-1.3.1-py2.py3-none-any.whl (23 kB)
Requirement already satisfied: pyasn1<0.6.0.>=0.4.6 in g:\Wanaconda3\lib\site-packages (from requests-oauthlib==1.3.1->tensorboard<2.11.>=2.10->tensorflow) (0.4.8)
Requirement already satisfied: certifi>=2017.4.17 in g:\Wanaconda3\lib\site-packages (from requests<3.>=2.21.0->tensorboard<2.11.>=2.10->tensorflow) (2021.10.8)
Requirement already satisfied: charset-normalizer==2.0.0 in g:\Wanaconda3\lib\site-packages (from requests<3.>=2.21.0->tensorboard<2.11.>=2.10->tensorflow) (2.0.4)
Requirement already satisfied: idna<4.>=2.5 in g:\Wanaconda3\lib\site-packages (from requests<3.>=2.21.0->tensorboard<2.11.>=2.10->tensorflow) (3.3)
Requirement already satisfied: urllib3<1.27.>=1.21.1 in g:\Wanaconda3\lib\site-packages (from requests<3.>=2.21.0->tensorboard<2.11.>=2.10->tensorflow) (1.26.9)
Collecting oauthlib>=3.0.0
  Downloading oauthlib-3.2.2-py3-none-any.whl (151 kB)
    | 151 kB 6.4 MB/s
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in g:\Wanaconda3\lib\site-packages (from packaging->tensorflow) (3.0.4)
Installing collected packages: oauthlib, requests-oauthlib, tensorboard-plugin-wit, tensorboard-data-server, google-auth-oauthlib, termcolor, tensorflow-io-gcs-filesystem, tensorflow-estimator, tensorboard, opt-einsum, libclang, keras-preprocessing, keras, google-pasta, gast, flatbuffers, astunparse, tensorflow
Successfully installed astunparse-1.6.3 flatbuffers-22.10.26 gast-0.4.0 google-auth-oauthlib-0.4.6 google-pasta-0.2.0 keras-2.10.0 keras-preprocessing-1.1.2 libclang-14.0.6 oauthlib-3.2.2 opt-einsum-3.3.0 requests-oauthlib-1.3.1 tensorboard-2.10.1 tensorboard-data-server-0.6.1 tensorflow-2.10.0 tensorflow-estimator-2.10.0 tensorflow-io-gcs-filesystem-0.27.0 termcol
pr-2.1.0
```

```
(base) PS C:\Users\Wmsiang> pip install tensorflow
Collecting tensorflow
  Downloading tensorflow-2.10.0-cp39-cp39-win_amd64.whl (455.9 MB)
    |████████████████████████████████████████| 455.9 MB 11 kB/s
Collecting tensorflow-io-gcs-filesystem>=0.23.1
  Downloading tensorflow_io_gcs_filesystem-0.27.0-cp39-cp39-win_amd64.whl (1.5 MB)
    |████████████████████████████████████████| 1.5 MB 6.4 MB/s
Collecting tensorboard<2.11,>=2.10
  Downloading tensorboard-2.10.1-py3-none-any.whl (5.9 MB)
    |████████████████████████████████████████| 5.9 MB ...
Requirement already satisfied: wrapt>=1.11.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.12.1)
Requirement already satisfied: packaging in g:\Wanaconda3\lib\site-packages (from tensorflow) (21.3)
Requirement already satisfied: absl-py>=1.0.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.3.0)
Collecting keras-preprocessing>=1.1.1
  Using cached Keras_Preprocessing-1.1.2-py2.py3-none-any.whl (42 kB)
Collecting keras<2.11,>=2.10.0
  Downloading keras-2.10.0-py2.py3-none-any.whl (1.7 MB)
    |████████████████████████████████████████| 1.7 MB 6.8 MB/s
Collecting libclang>=13.0.0
  Downloading libclang-14.0.6-py2.py3-none-win_amd64.whl (14.2 MB)
    |████████████████████████████████████████| 14.2 MB 6.4 MB/s
Collecting flatbuffers>=2.0
  Downloading flatbuffers-22.10.26-py2.py3-none-any.whl (26 kB)
Collecting astunparse>=1.6.0
  Using cached astunparse-1.6.3-py2.py3-none-any.whl (12 kB)
Collecting tensorflow-estimator<2.11,>=2.10.0
  Downloading tensorflow_estimator-2.10.0-py2.py3-none-any.whl (438 kB)
    |████████████████████████████████████████| 438 kB 6.4 MB/s
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Collecting termcolor>=1.1.0
  Downloading termcolor-2.1.0-py3-none-any.whl (5.8 kB)
Collecting google-pasta>=0.1.1
  Using cached google_pasta-0.2.0-py3-none-any.whl (57 kB)
Collecting gast<=0.4.0,>=0.2.1
  Downloading gast-0.4.0-py3-none-any.whl (9.8 kB)
Requirement already satisfied: typing-extensions>=3.6.6 in g:\Wanaconda3\lib\site-packages (from tensorflow) (4.1.1)
Requirement already satisfied: numpy>=1.20 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.21.5)
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Requirement already satisfied: six>=1.12.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (1.16.0)
Requirement already satisfied: h5py>=2.9.0 in g:\Wanaconda3\lib\site-packages (from tensorflow) (3.6.0)
Requirement already satisfied: protobuf<3.20,>=3.9.2 in g:\Wanaconda3\lib\site-packages (from tensorflow) (3.19.1)
Requirement already satisfied: setuptools in g:\Wanaconda3\lib\site-packages (from tensorflow) (61.2.0)
Requirement already satisfied: wheel<1.0,>=0.23.0 in g:\Wanaconda3\lib\site-packages (from astunparse>=1.6.0->tensorflow) (0.37.1)
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Collecting tensorboard-data-server<0.7.0,>=0.6.0
  Downloading tensorboard_data_server-0.6.1-py3-none-any.whl (2.4 kB)
```

```

Collecting tensorboard-data-server<0.7.0,>=0.6.0
  Downloading tensorboard_data_server-0.6.1-py3-none-any.whl (2.4 kB)
Collecting tensorboard-plugin-wit>=1.6.0
  Downloading tensorboard_plugin_wit-1.8.1-py3-none-any.whl (781 kB)
    |████████████████████| 781 kB ...
Requirement already satisfied: markdown>=2.6.8 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (3.3.4)
Requirement already satisfied: werkzeug>=1.0.1 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.0.3)
Requirement already satisfied: google-auth<3,>=1.6.3 in g:\Wanaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (1.33.0)
Requirement already satisfied: cachetools<5.0,>=2.0.0 in g:\Wanaconda3\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (4.2.2)
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Requirement already satisfied: pyasn1-modules>=0.2.1 in g:\Wanaconda3\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (0.2.8)
Collecting requests-oauthlib>=0.7.0
  Downloading requests_oauthlib-1.3.1-py2.py3-none-any.whl (23 kB)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in g:\Wanaconda3\lib\site-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (0.4.8)
Requirement already satisfied: certifi>=2017.4.17 in g:\Wanaconda3\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.11,>=2.10->tensorflow) (2021.10.8)
Requirement already satisfied: charset-normalizer~=2.0.0 in g:\Wanaconda3\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.11,>=2.10->tensorflow) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in g:\Wanaconda3\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.11,>=2.10->tensorflow) (3.3)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in g:\Wanaconda3\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.11,>=2.10->tensorflow) (1.26.9)
Collecting oauthlib>=3.0.0
  Downloading oauthlib-3.2.2-py3-none-any.whl (151 kB)
    |████████████████████| 151 kB 6.4 MB/s
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in g:\Wanaconda3\lib\site-packages (from packaging->tensorflow) (3.0.4)
Installing collected packages: oauthlib, requests-oauthlib, tensorboard-plugin-wit, tensorboard-data-server, google-auth-oauthlib, termcolor, tensorflow-io-gcs-filesystem, tensorflow-estimator, tensorboard, opt-einsum, libclang, keras-preprocessing, keras, google-pasta, gast, flatbuffers, astunparse, tensorflow
Successfully installed astunparse-1.6.3 flatbuffers-22.10.26 gast-0.4.0 google-auth-oauthlib-0.4.6 google-pasta-0.2.0 keras-2.10.0 keras-preprocessing-1.1.2 libclang-14.0.6 oauthlib-3.2.2 opt-einsum-3.3.0 requests-oauthlib-1.3.1 tensorboard-2.10.1 tensorboard-data-server-0.6.1 tensorboard-plugin-wit-1.8.1 tensorflow-2.10.0 tensorflow-estimator-2.10.0 tensorflow-io-gcs-filesystem-0.27.0 termcolor-2.1.0

```

In [2]:

```
1 import time
2 import keras_cv
```

ModuleNotFoundError Traceback (most recent call last)

Input In [2], in <cell line: 2>():

```
1 import time
----> 2 import keras_cv
```

File g:\Anaconda3\lib\site-packages\keras_cv__init__.py:21, in <module>

```
18 version_check.check_tf_version()
19 # isort: on
----> 21 from keras_cv import datasets
22 from keras_cv import layers
23 from keras_cv import losses
```

File g:\Anaconda3\lib\site-packages\keras_cv\datasets__init__.py:14, in <module>

```
1 # Copyright 2022 The KerasCV Authors
2 #
3 # Licensed under the Apache License, Version 2.0 (the "License");
4 # See the License for the specific language governing permissions and
5 # limitations under the License.
----> 14 from keras_cv.datasets import pascal_voc
```

File g:\Anaconda3\lib\site-packages\keras_cv\datasets\pascal_voc__init__.py:14, in <module>

```
1 # Copyright 2022 The KerasCV Authors
2 #
3 # Licensed under the Apache License, Version 2.0 (the "License");
4 # See the License for the specific language governing permissions and
5 # limitations under the License.
----> 14 from keras_cv.datasets.pascal_voc.load import load
```

File g:\Anaconda3\lib\site-packages\keras_cv\datasets\pascal_voc\load.py:16, in <module>

```
1 # Copyright 2022 The KerasCV Authors
2 #
3 # Licensed under the Apache License, Version 2.0 (the "License");
4 # See the License for the specific language governing permissions and
5 # limitations under the License.
15 import tensorflow as tf
----> 16 import tensorflow_datasets as tfds
17 from tensorflow import keras
18 from keras_cv import bounding_box
```

ModuleNotFoundError: No module named 'tensorflow_datasets'

```
(base) PS C:\Users\WmsJang> pip install tensorflow_datasets
Collecting tensorflow_datasets
  Downloading tensorflow_datasets-4.7.0-py3-none-any.whl (4.7 MB)
    |████████████████████| 4.7 MB 6.8 MB/s
Requirement already satisfied: tqdm in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (4.64.0)
Requirement already satisfied: toml in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (0.10.2)
Requirement already satisfied: termcolor in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (2.1.0)
Requirement already satisfied: absl-py in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (1.3.0)
Requirement already satisfied: numpy in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (1.21.5)
Collecting dill
  Downloading dill-0.3.6-py3-none-any.whl (110 kB)
    |████████████████████| 110 kB ...
Requirement already satisfied: six in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (1.16.0)
Requirement already satisfied: protobuf>=3.12.2 in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (3.19.1)
Requirement already satisfied: requests>=2.19.0 in g:\Wanaconda3\lib\site-packages (from tensorflow_datasets) (2.27.1)
Collecting tensorflow-metadata
  Downloading tensorflow_metadata-1.10.0-py3-none-any.whl (50 kB)
    |████████████████████| 50 kB 3.1 MB/s
Collecting etils[epath]
  Downloading etils-0.9.0-py3-none-any.whl (140 kB)
    |████████████████████| 140 kB ...
Collecting promise
  Downloading promise-2.3.tar.gz (19 kB)
Requirement already satisfied: charset-normalizer<=2.0.0 in g:\Wanaconda3\lib\site-packages (from requests>=2.19.0->tensorflow_datasets) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in g:\Wanaconda3\lib\site-packages (from requests>=2.19.0->tensorflow_datasets) (3.3)
Requirement already satisfied: certifi>=2017.4.17 in g:\Wanaconda3\lib\site-packages (from requests>=2.19.0->tensorflow_datasets) (2021.10.8)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in g:\Wanaconda3\lib\site-packages (from requests>=2.19.0->tensorflow_datasets) (1.26.9)
Collecting importlib_resources
  Downloading importlib_resources-5.10.0-py3-none-any.whl (34 kB)
Requirement already satisfied: zipp in g:\Wanaconda3\lib\site-packages (from etils[epath]->tensorflow_datasets) (3.7.0)
Requirement already satisfied: typing_extensions in g:\Wanaconda3\lib\site-packages (from etils[epath]->tensorflow_datasets) (4.1.1)
Requirement already satisfied: googleapis-common-protos<2,>=1.52.0 in g:\Wanaconda3\lib\site-packages (from tensorflow-metadata->tensorflow_datasets) (1.53.0)
Requirement already satisfied: colorama in g:\Wanaconda3\lib\site-packages (from tqdm->tensorflow_datasets) (0.4.4)
Building wheels for collected packages: promise
  Building wheel for promise (setup.py) ... done
  Created wheel for promise: filename=promise-2.3-py3-none-any.whl size=21503 sha256=55bf9f5d58237be8a9b814f35926e20bbb8ff7cf7a342bfd9dbe57a46524d77
  Stored in directory: c:\Users\WmsJang\AppData\Local\pip\Cache\wheels\1e\1e\83\dd\ea66100678d139b14bc87692ece57c6a2a937956d2532608
Successfully built promise
Installing collected packages: etils, importlib-resources, tensorflow-metadata, promise, dill, tensorflow-datasets
Successfully installed dill-0.3.6 etils-0.9.0 importlib-resources-5.10.0 promise-2.3 tensorflow-datasets-4.7.0 tensorflow-metadata-1.10.0
```

```
In [3]: 1 import time
        2 import keras_cv
```

```
In [5]: 1 import time
        2 import keras_cv
        3 from tensorflow import keras
        4 import matplotlib.pyplot as plt
```

Stable Diffusion Model Load

```
In [6]: 1 model = keras_cv.models.StableDiffusion(img_width=512, img_height=512)
```

Downloading data from https://github.com/openai/CLIP/blob/main/clip/bpe_simple_vocab_16e6.txt.gz?raw=true

1356917/1356917 [=====] - 1s 1us/step

By using this model checkpoint, you acknowledge that its usage is subject to the terms of the CreativeML Open RAIL-M license at <https://raw.githubusercontent.com/CompVis/stable-diffusion/main/LICENSE>

Downloading data from https://huggingface.co/fchollet/stable-diffusion/resolve/main/kcv_encoder.h5

492466864/492466864 [=====] - 42s 0us/step

Downloading data from https://huggingface.co/fchollet/stable-diffusion/resolve/main/kcv_diffusion_model.h5

3439090152/3439090152 [=====] - 297s 0us/step

Downloading data from https://huggingface.co/fchollet/stable-diffusion/resolve/main/kcv_decoder.h5

198180272/198180272 [=====] - 17s 0us/step

```
In [7]: 1 def plot_images(images):
2         plt.figure(figsize=(20,20))
3         for i in range(len(images)):
4             ax = plt.subplot(1, len(images), i+1)
5             plt.imshow(images[i])
6             plt.axis("off")
7             plt.tight_layout()
```

첫번째 이미지 생성

```
In [8]: 1 # 우주인이 말을 타고 있는 이미지를 3장 생성해라
2         images = model.text_to_image("photograph of an astronaut riding a house", batch_size=3)
3         plot_images(images)
```

25/25 [=====] - 997s 39s/step



```
(base) PS C:\Users\msjang> pip install translate
Collecting translate
  Downloading translate-3.6.1-py2.py3-none-any.whl (12 kB)
Requirement already satisfied: click in g:\anaconda3\lib\site-packages (from translate) (8.0.4)
Requirement already satisfied: lxml in g:\anaconda3\lib\site-packages (from translate) (4.8.0)
Requirement already satisfied: requests in g:\anaconda3\lib\site-packages (from translate) (2.27.1)
Collecting libretranslatepy==2.1.1
  Downloading libretranslatepy-2.1.1-py3-none-any.whl (3.2 kB)
Requirement already satisfied: colorama in g:\anaconda3\lib\site-packages (from click->translate) (0.4.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in g:\anaconda3\lib\site-packages (from requests->translate) (1.26.9)
Requirement already satisfied: idna<4,>=2.5 in g:\anaconda3\lib\site-packages (from requests->translate) (3.3)
Requirement already satisfied: charset-normalizer~=2.0.0 in g:\anaconda3\lib\site-packages (from requests->translate) (2.0.4)
Requirement already satisfied: certifi>=2017.4.17 in g:\anaconda3\lib\site-packages (from requests->translate) (2021.10.8)
Installing collected packages: libretranslatepy, translate
Successfully installed libretranslatepy-2.1.1 translate-3.6.1
```

한글 -> 영어 번역

```
In [10]: 1 from translate import Translator
          2
          3 translator = Translator(from_lang="ko", to_lang = "en")
          4 translation = translator.translate("펭귄이 곰한테 뽀뽀하는 모습")
          5 print(translation)
```

Peng Quinn kisses a bear

그림 생성 앱 만들기

```
(base) PS C:\Users\msjang> pip install -q gradio
(base) PS C:\Users\msjang>
```

[illegible]

함수화

```
In [*]: 1 def generate_images(text, n=1):
2         print(text)
3         translation = translator.translate(text)
4         print(translation)
5
6         image = model.text_to_image(translation, batch_size=n)
7         return image
8
9 images = generate_images("사람과 개가 함께가는 모습")
10 plot_images(images)
```

```
In [*]: 1 import gradio as gr
2 def inference(text):
3     image = generate_image(text, 1).squeeze()
4     return image
5
6 demo = gr.Interface(fn=inference, inputs="text", outputs="image")
7
8 demo.launch(debug=True)
```

ning on local URL: <http://127.0.0.1:7860>

create a public link, set `share=True` in `launch()`.

The image shows a Gradio web interface. On the left, there is a text input box labeled 'text' containing the text 'photograph of an astronaut riding a horse'. Below the input box are two buttons: a grey '클리어' (Clear) button and an orange '제출하기' (Submit) button. To the right of the input area is a large rectangular box that currently displays the word 'Error' in red text, indicating a failure in the inference process.