

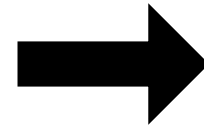
이미지 분석

쿠글 11기 김지현
쿠글 11기 정채현

| 이미지 분석



이미지 조사



정보 수집

| 이미지 분석

이미지 분류

객체 탐지

분할

이미지 분석

Classification



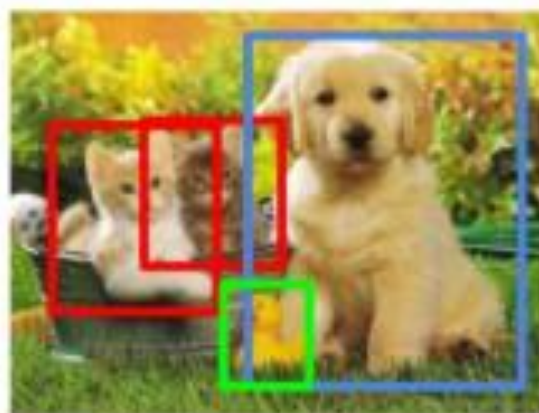
CAT

Classification
+ Localization



CAT

Object Detection



CAT, DOG, DUCK

Instance
Segmentation



CAT, DOG, DUCK

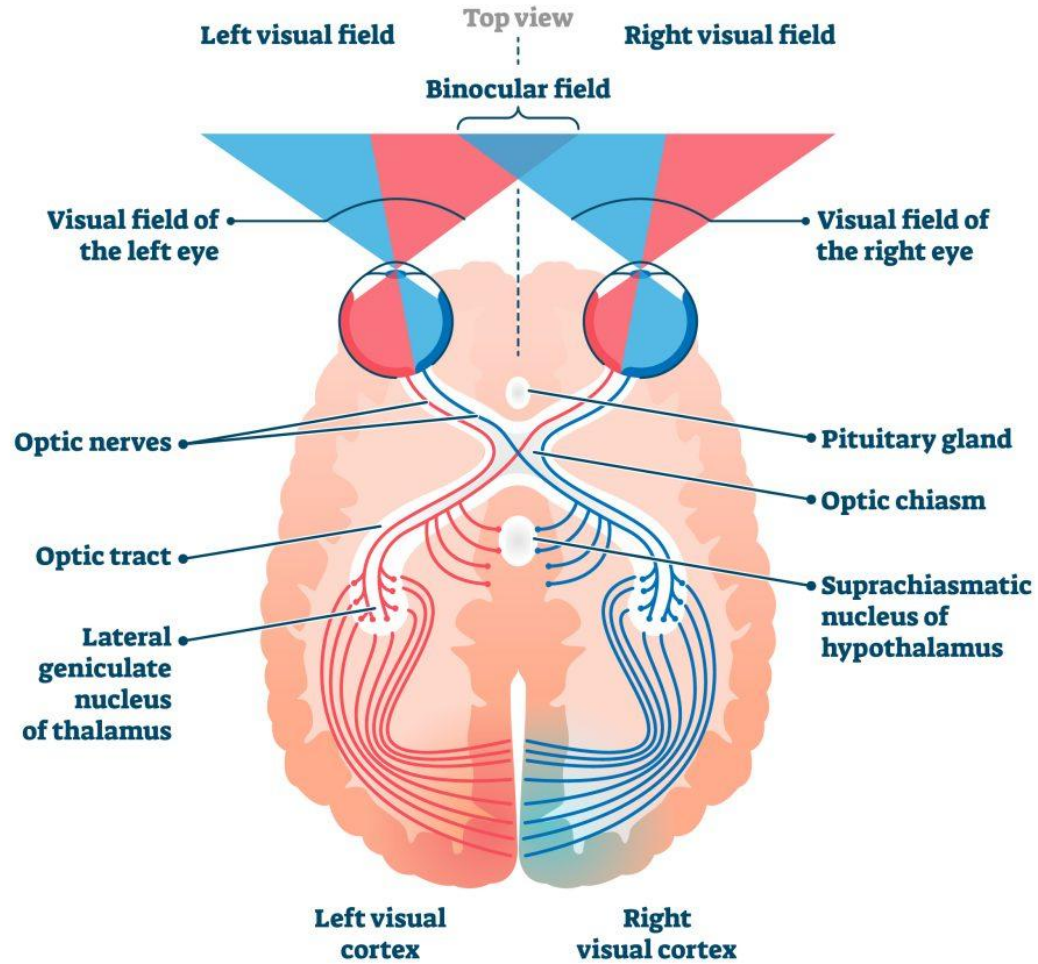
Single object

Multiple objects

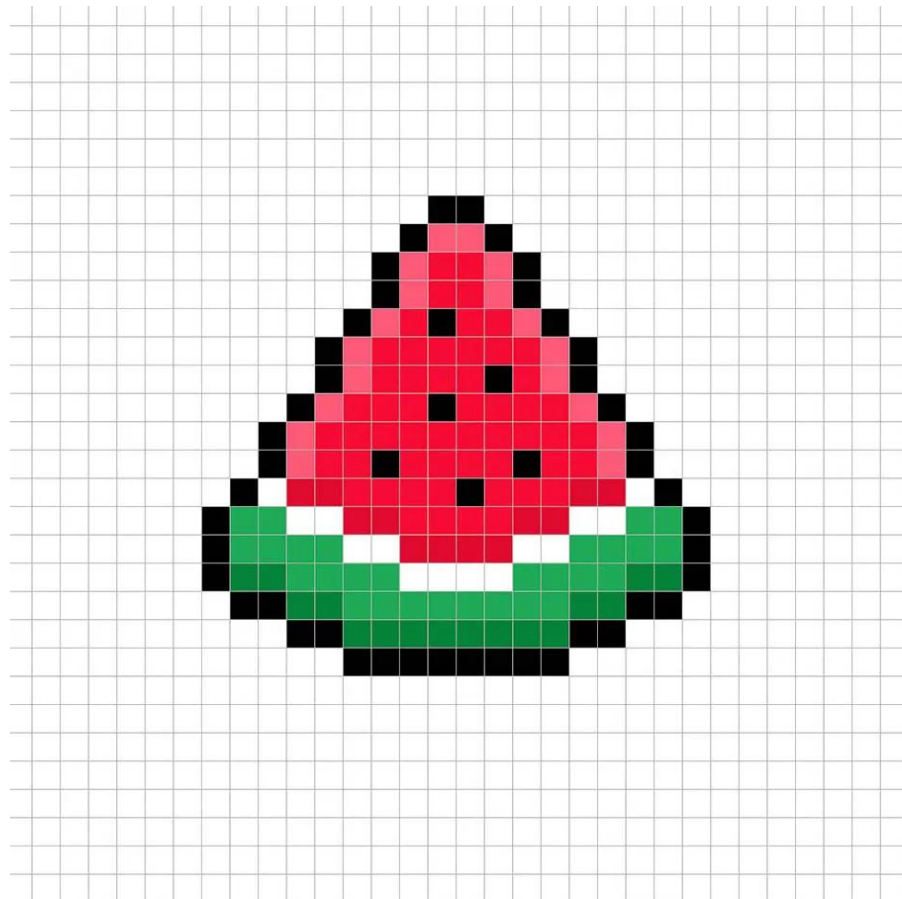
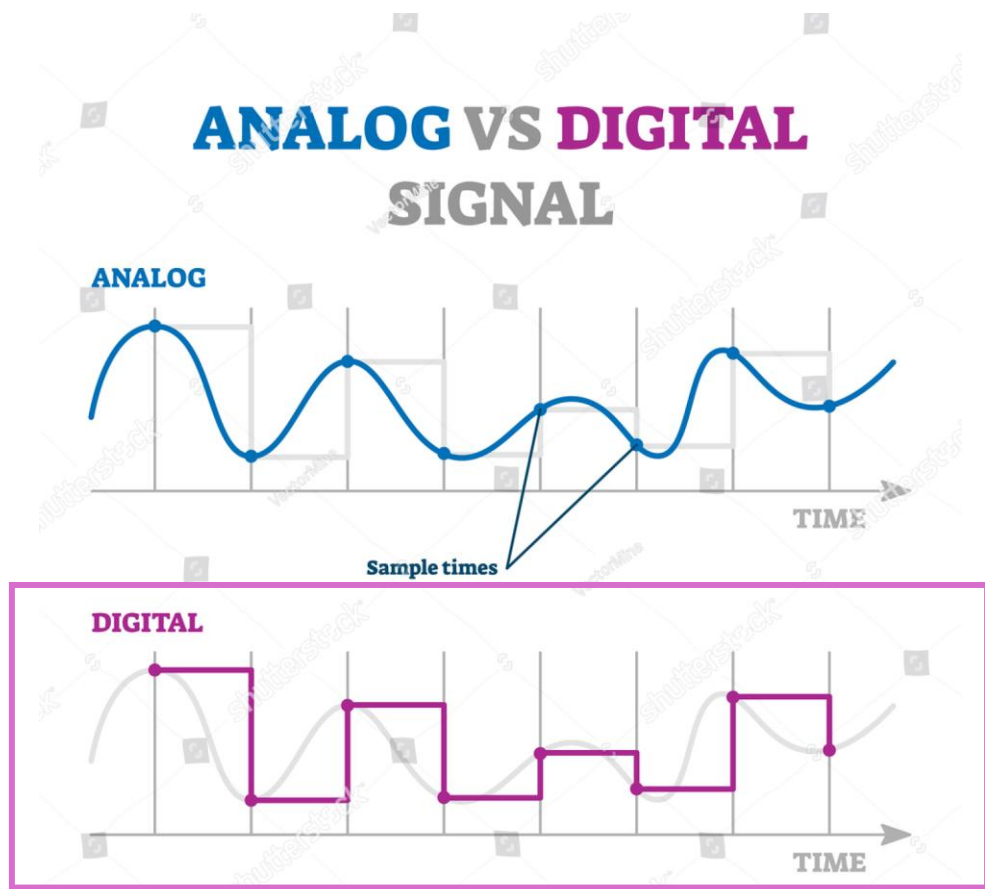
이미지?

이미지

VISUAL PATHWAY



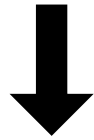
디지털 이미지



픽셀 (Pixel)

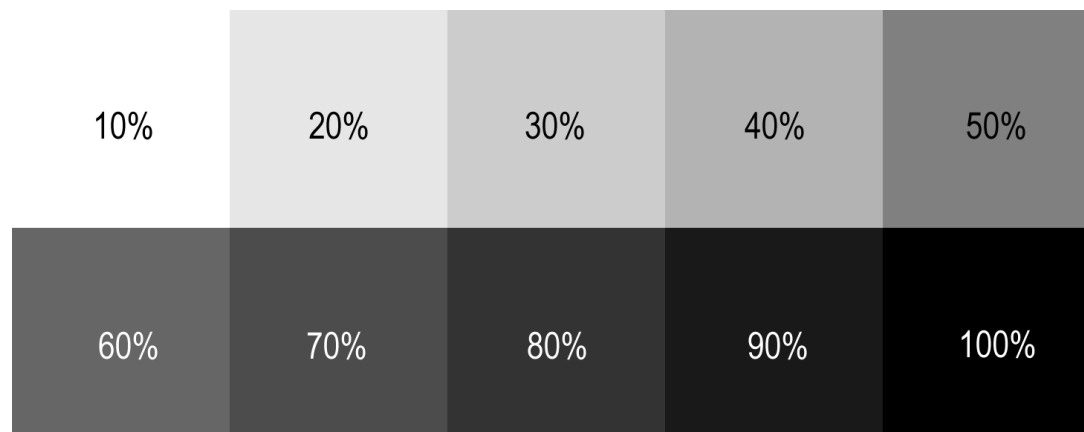
픽셀 (Pixel)

이미지의 가장 작은 구성 요소



밝기 + 색

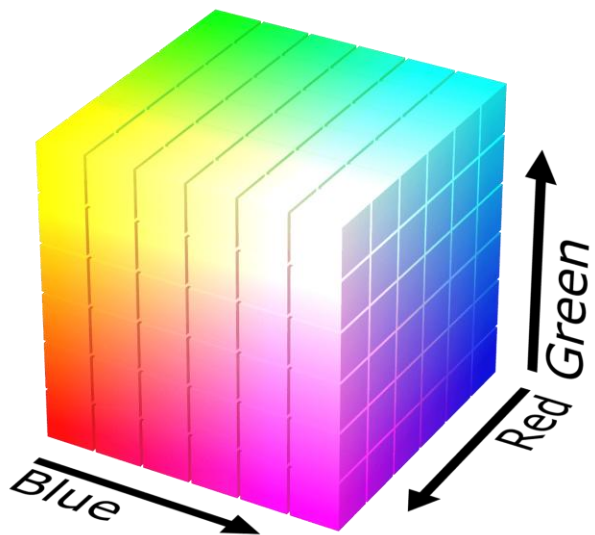
| 색 공간



그레이 스케일 0~255

- 가장자리 감지
- 텍스처 분석

| 색 공간



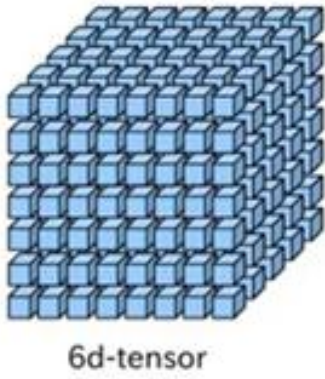
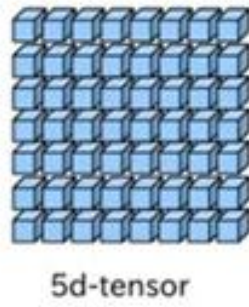
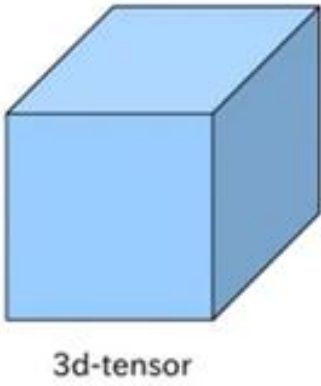
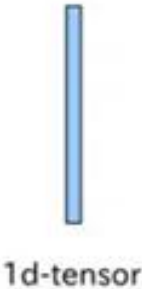
RGB

red/green/blue channel

→ 256^3

텐서 (Tensor)

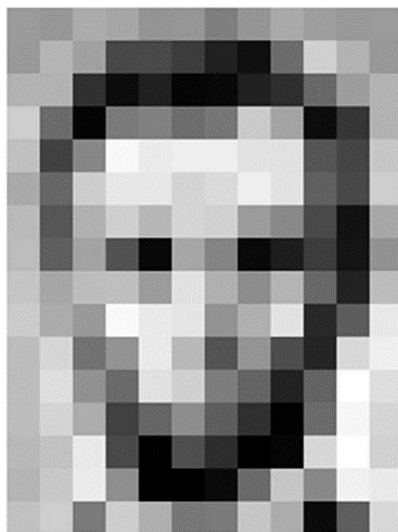
수치 데이터를 담는 다차원 배열



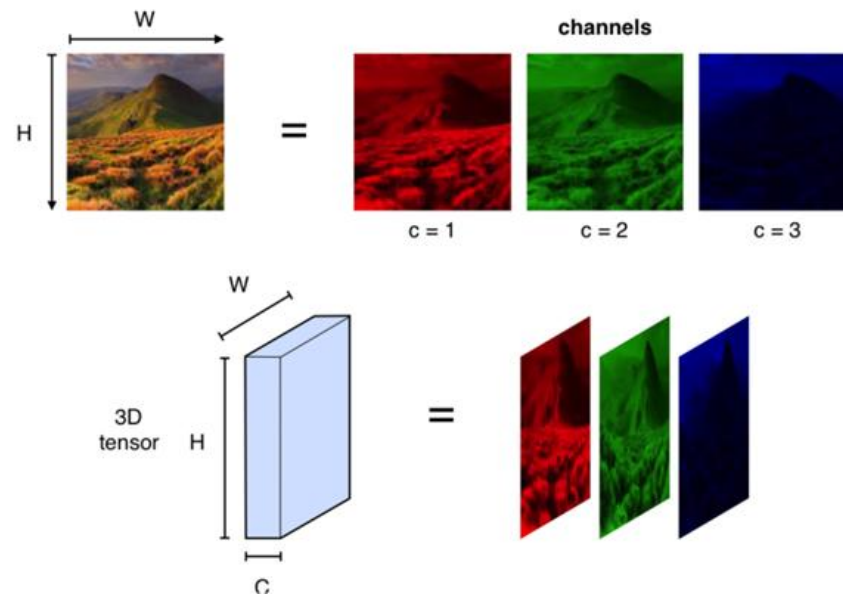
텐서 (Tensor)

딥러닝과 이미지 처리에서

이미지 데이터를 수치화하여 표현하는 핵심 구조



157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	94	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	228	227	87	71	201	
172	105	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	91	62	22	148
199	168	191	193	158	227	178	143	182	106	96	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	86	150	79	38	218	241
190	224	147	108	227	210	127	102	96	101	255	224
190	214	173	66	103	143	96	90	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

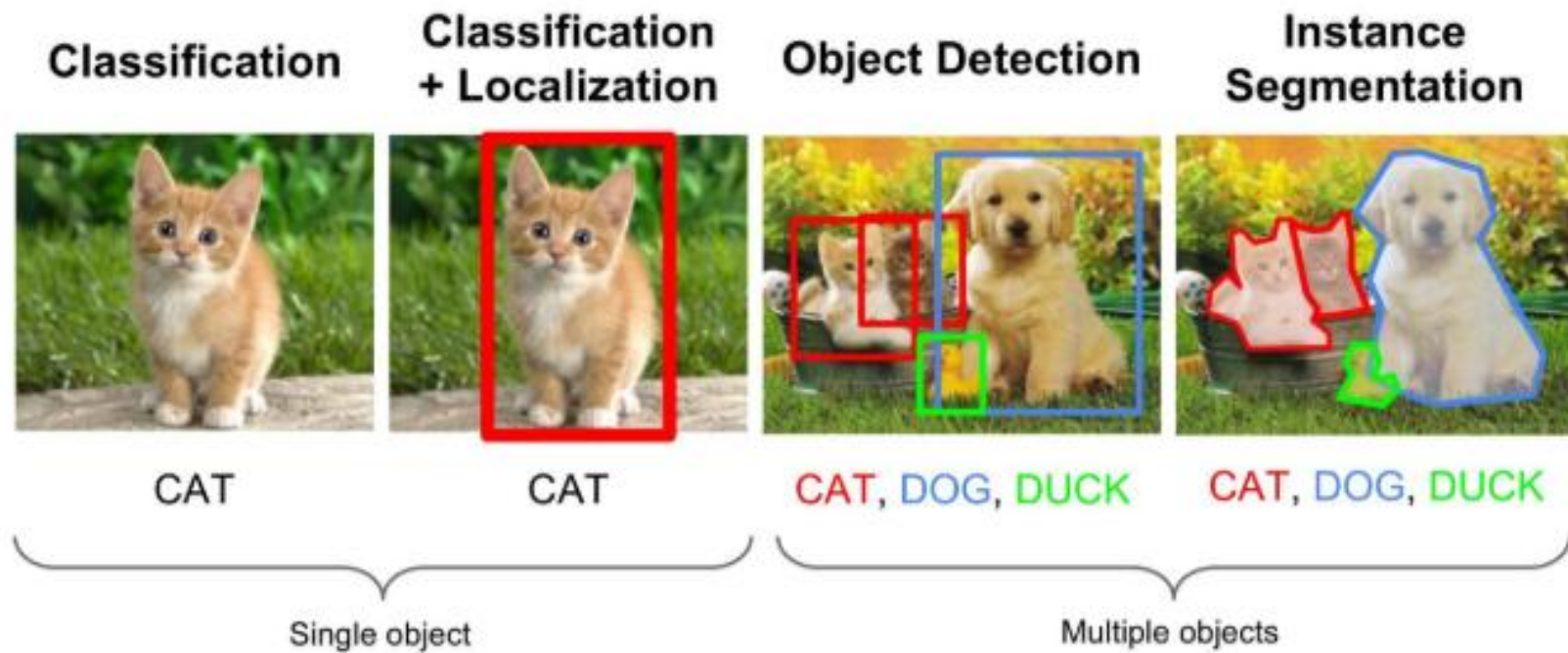


Height X Width

Channel X Height X Width

Batch X Channel X Height X Width

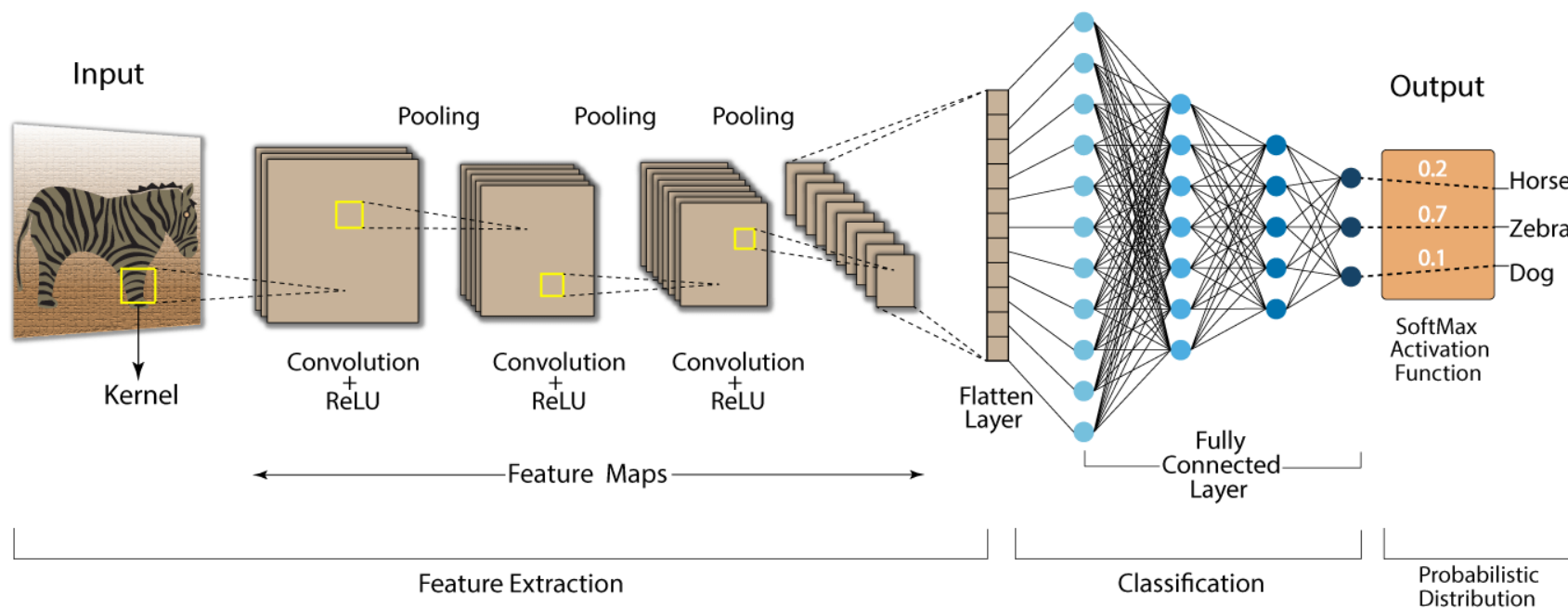
이미지 분석



CNN 기반

CNN (Convolutional Neural Network)

이미지 처리에 탁월한 성능을 보이는 신경망

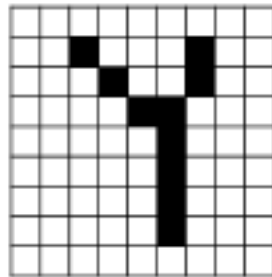


Convolution Layer

합성곱

CNN (Convolutional Neural Network)

다층 퍼셉트론



↓ 변환

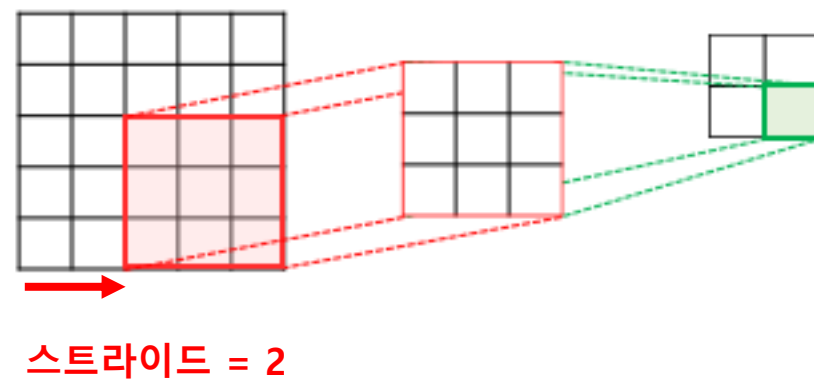
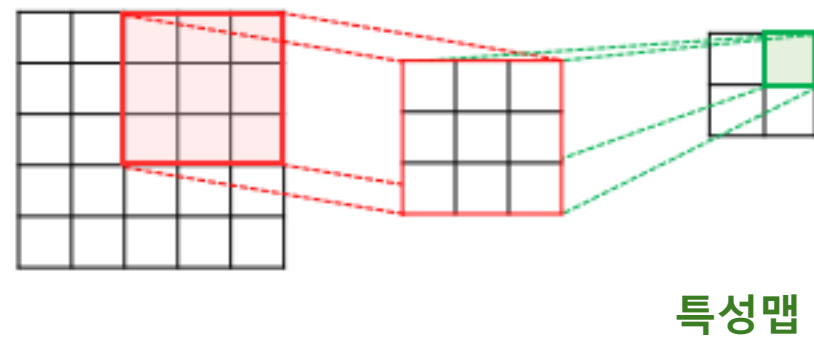
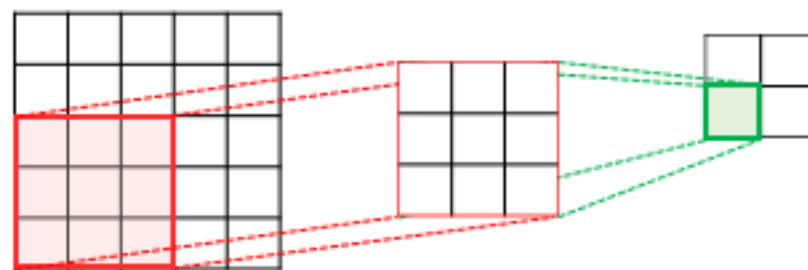
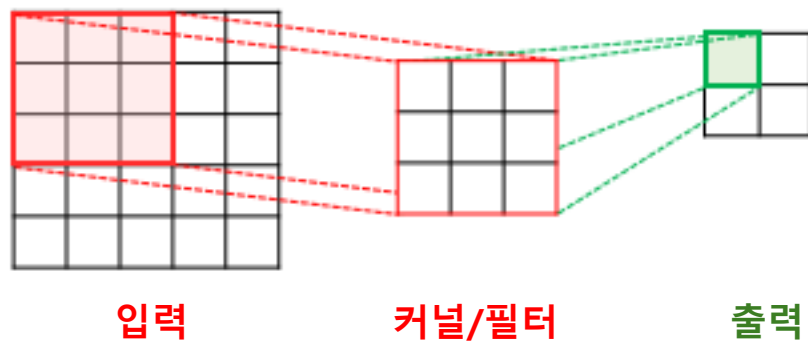


입력 : 1차원 텐서

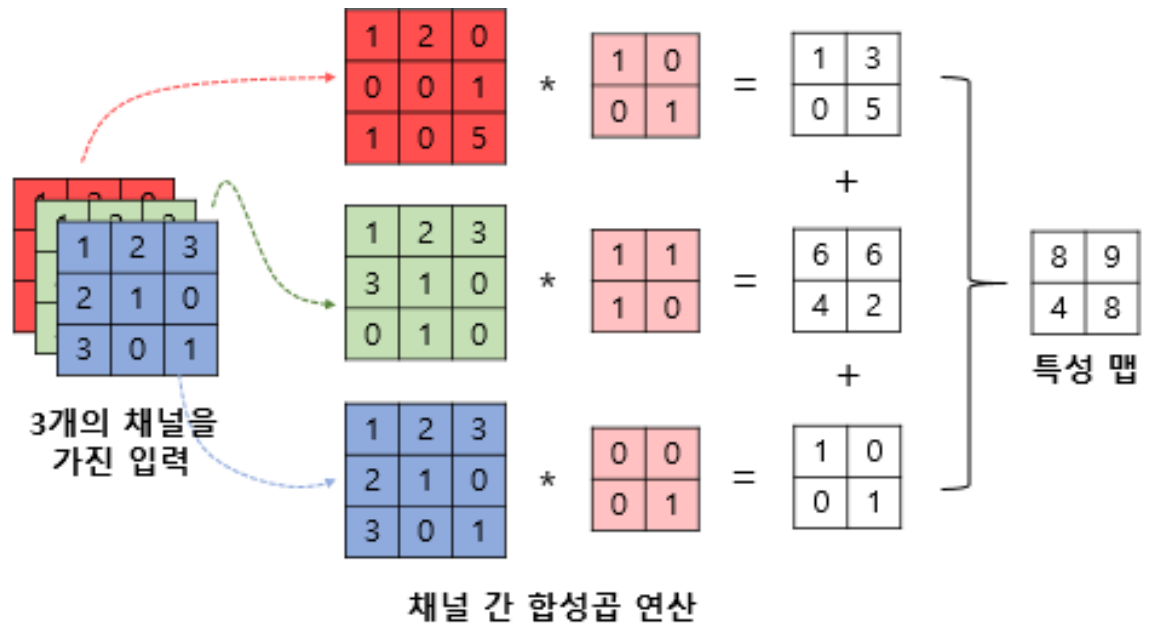


공간적인 구조(spatial structure)
정보 유실

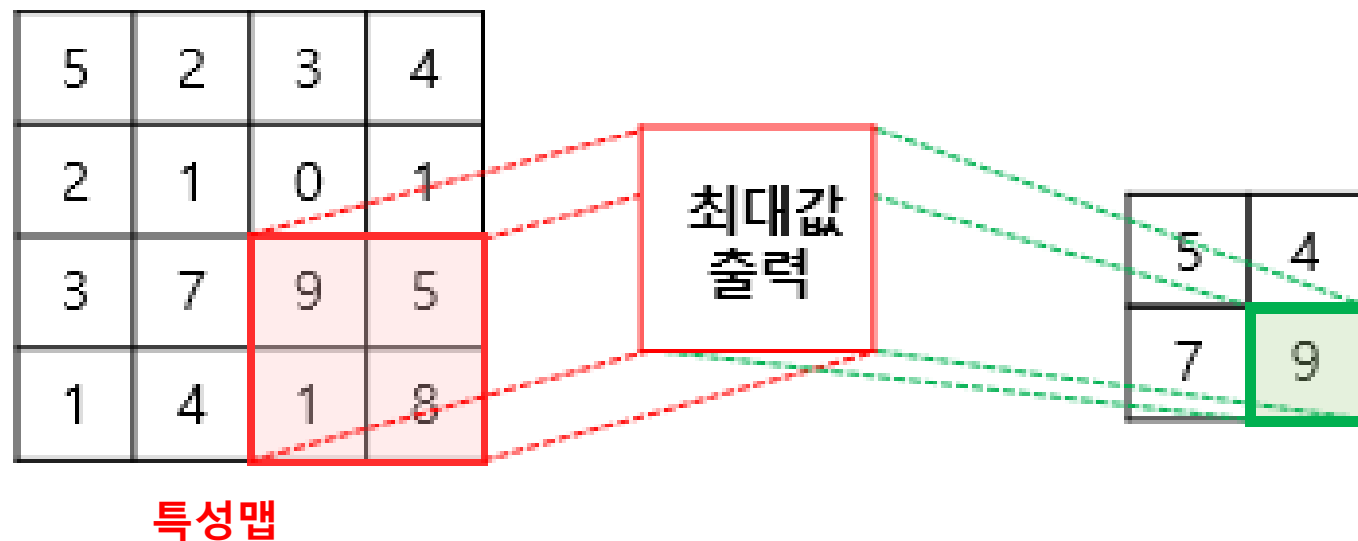
Convolution layer



Convolution layer



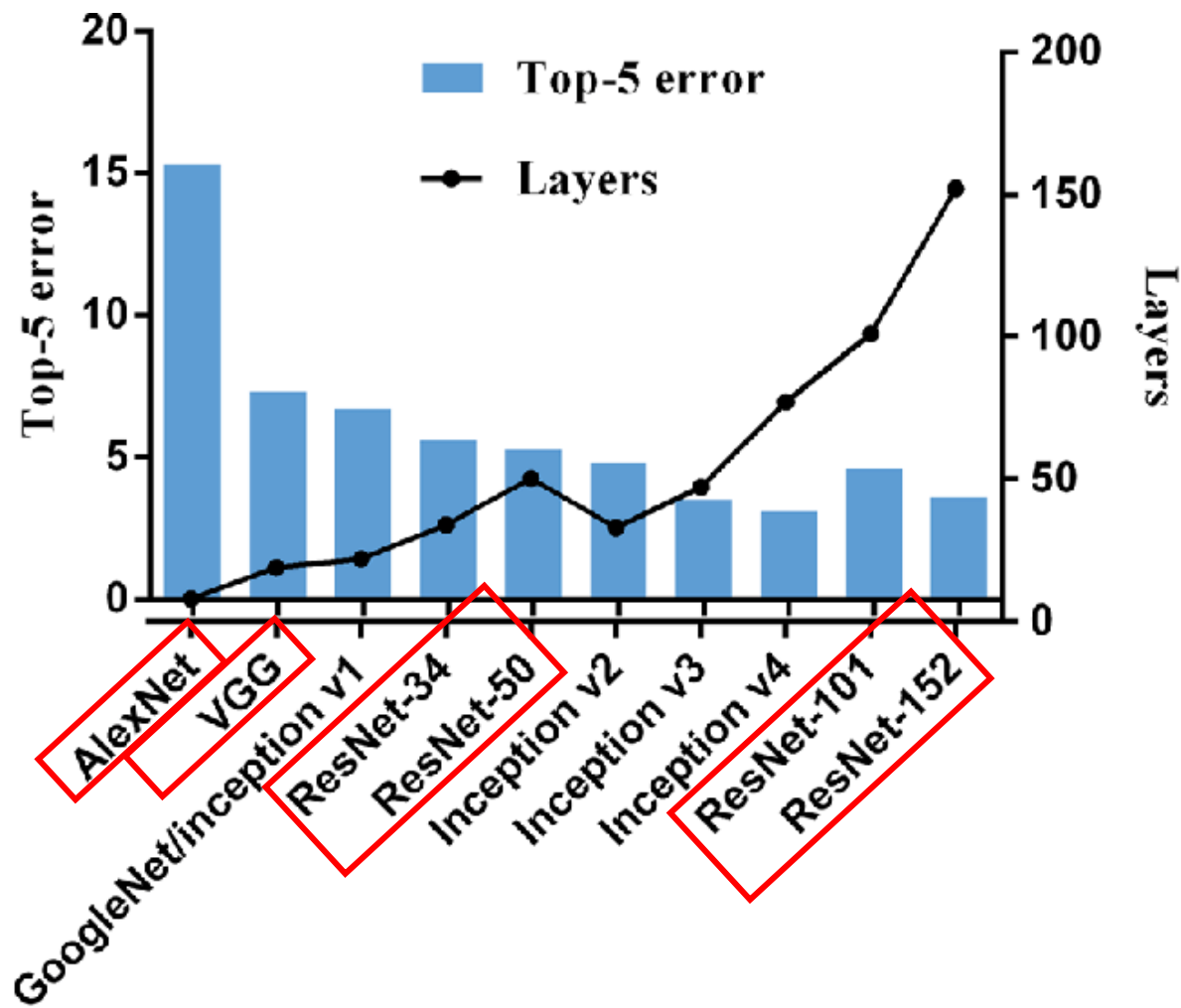
Pooling layer



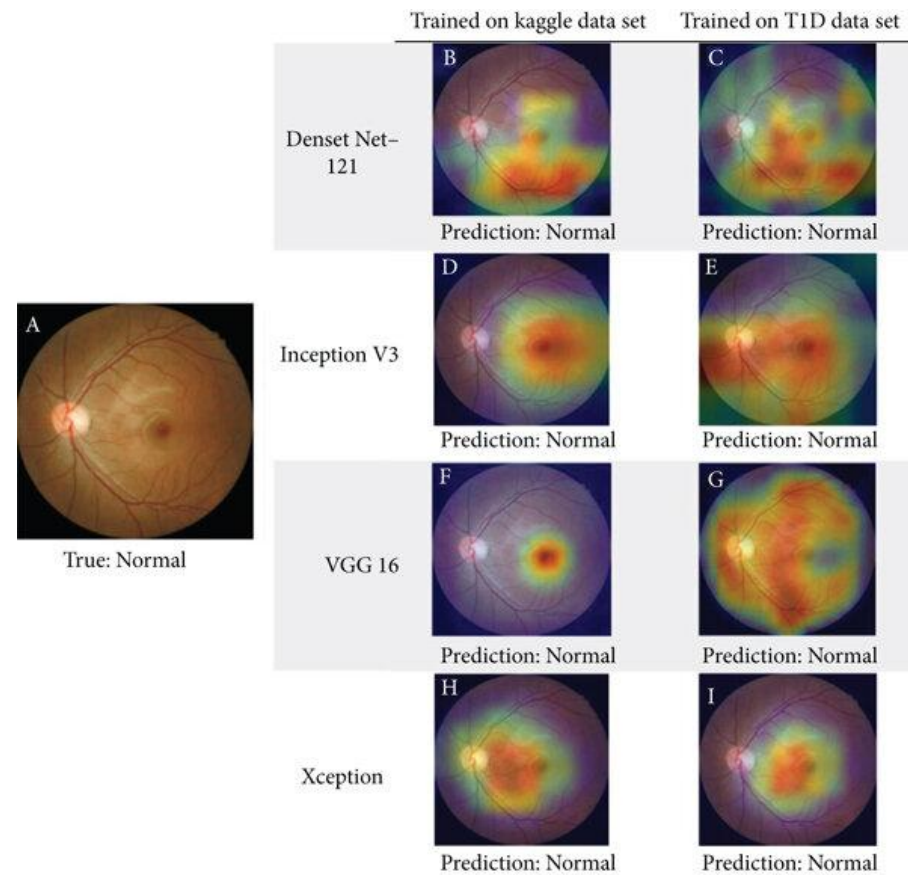
- Max Pooling
- Average Pooling

이미지 분석 모델 종류

이미지 분류 모델

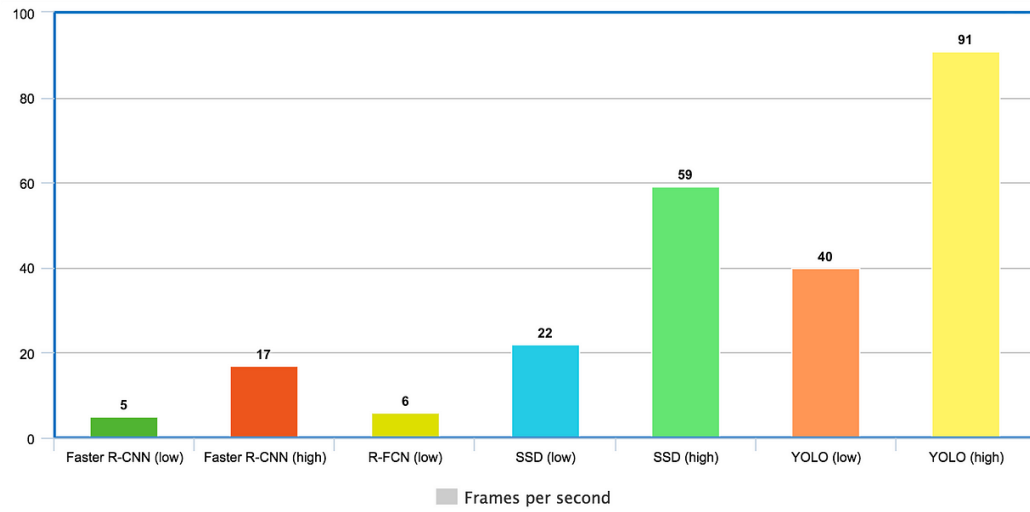


AlexNet / VGG / ResNet

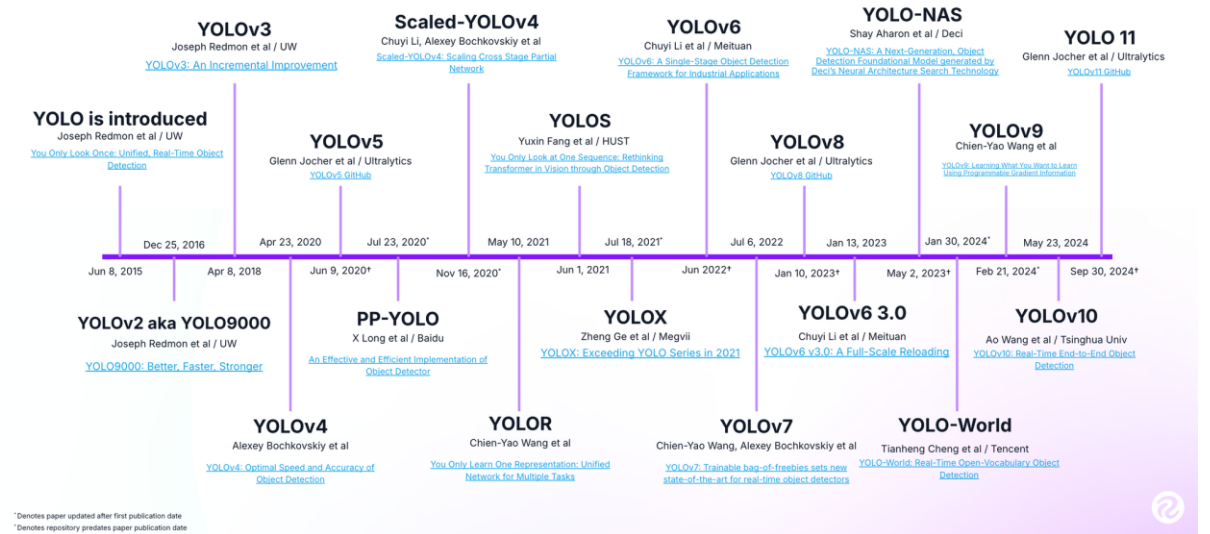


Grad-CAM

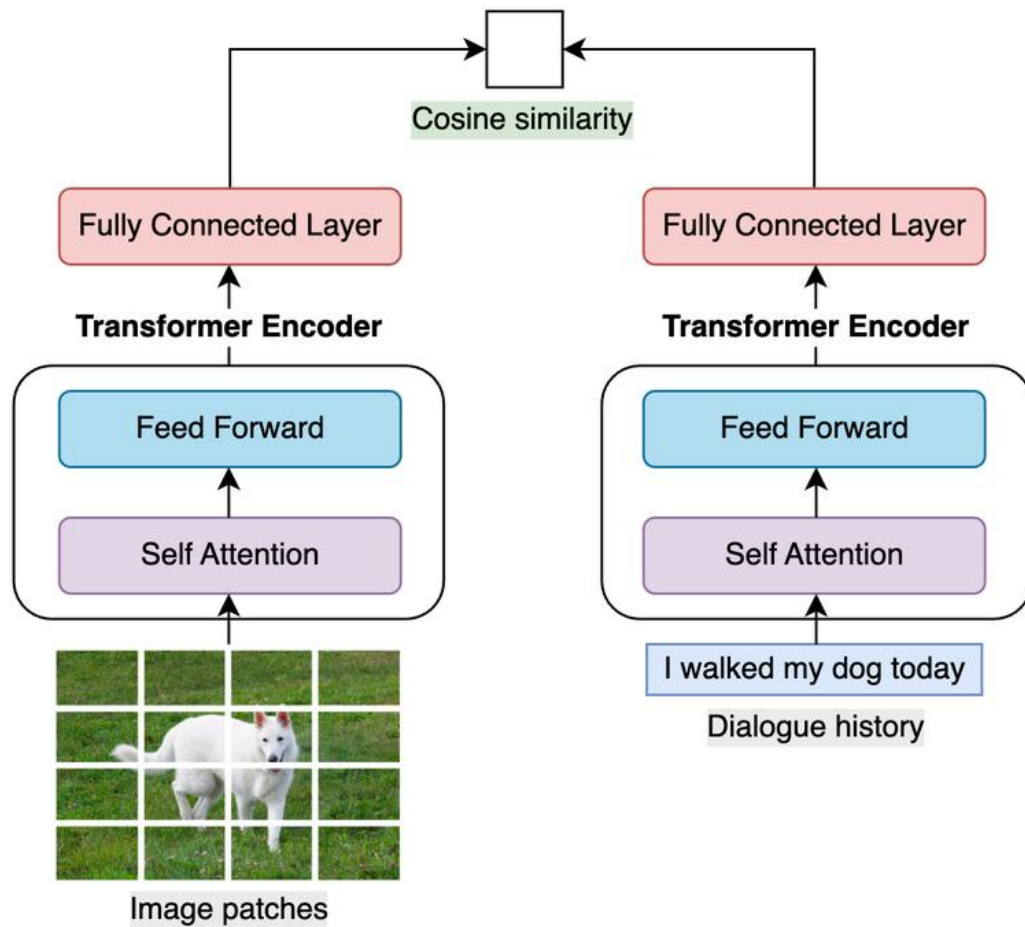
객체 탐지 모델



YOLO Greatest Hits



비전 트랜스포머 (ViT)



감사합니다.