

자동화 특론

Intelligent Automation System

박태형

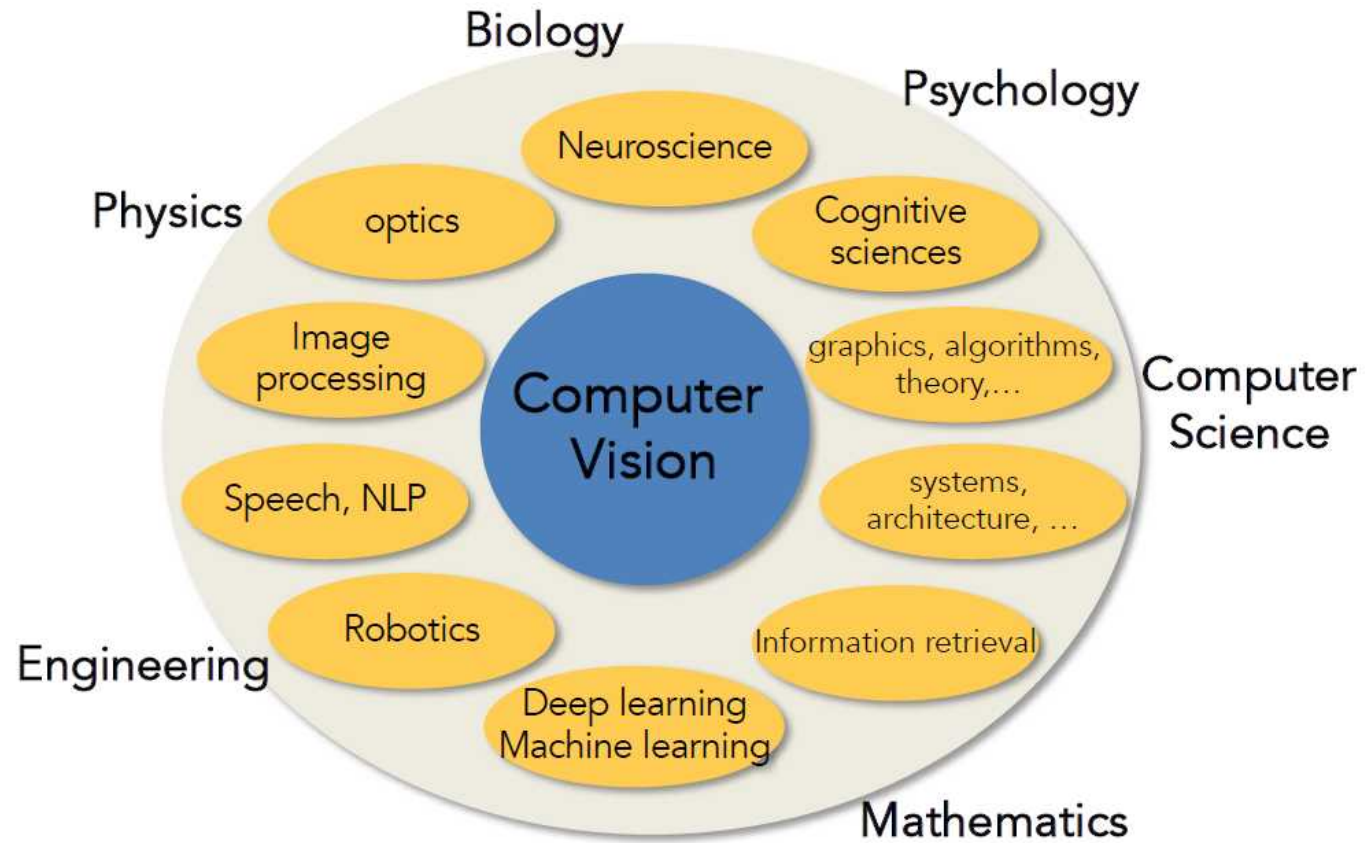
taehpark@cbnu.ac.kr

<http://robotics.cbnu.ac.kr>

E10-313/317

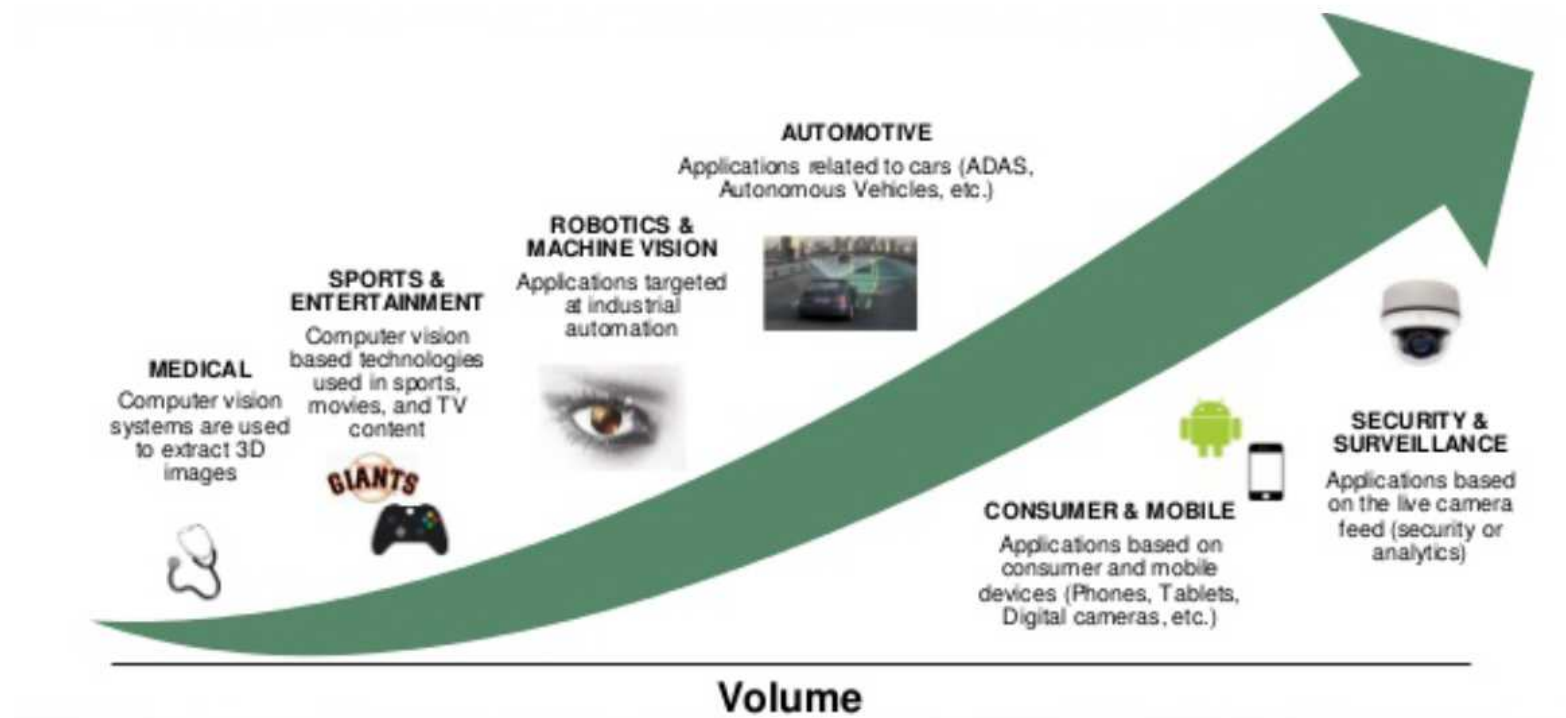
Computer Vision

- 관련 분야



Computer Vision

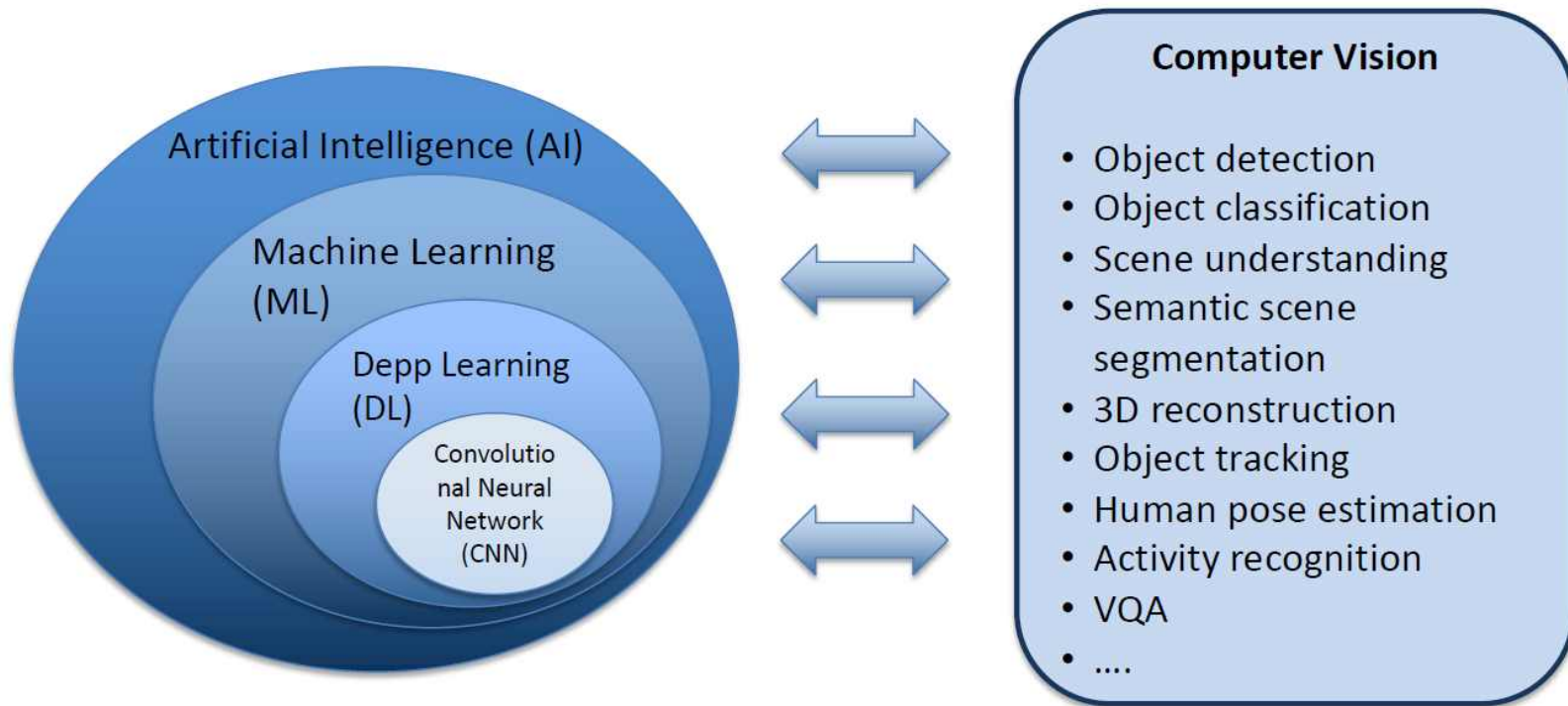
- 응용 분야



Slide source: World Capital Partners, 2017

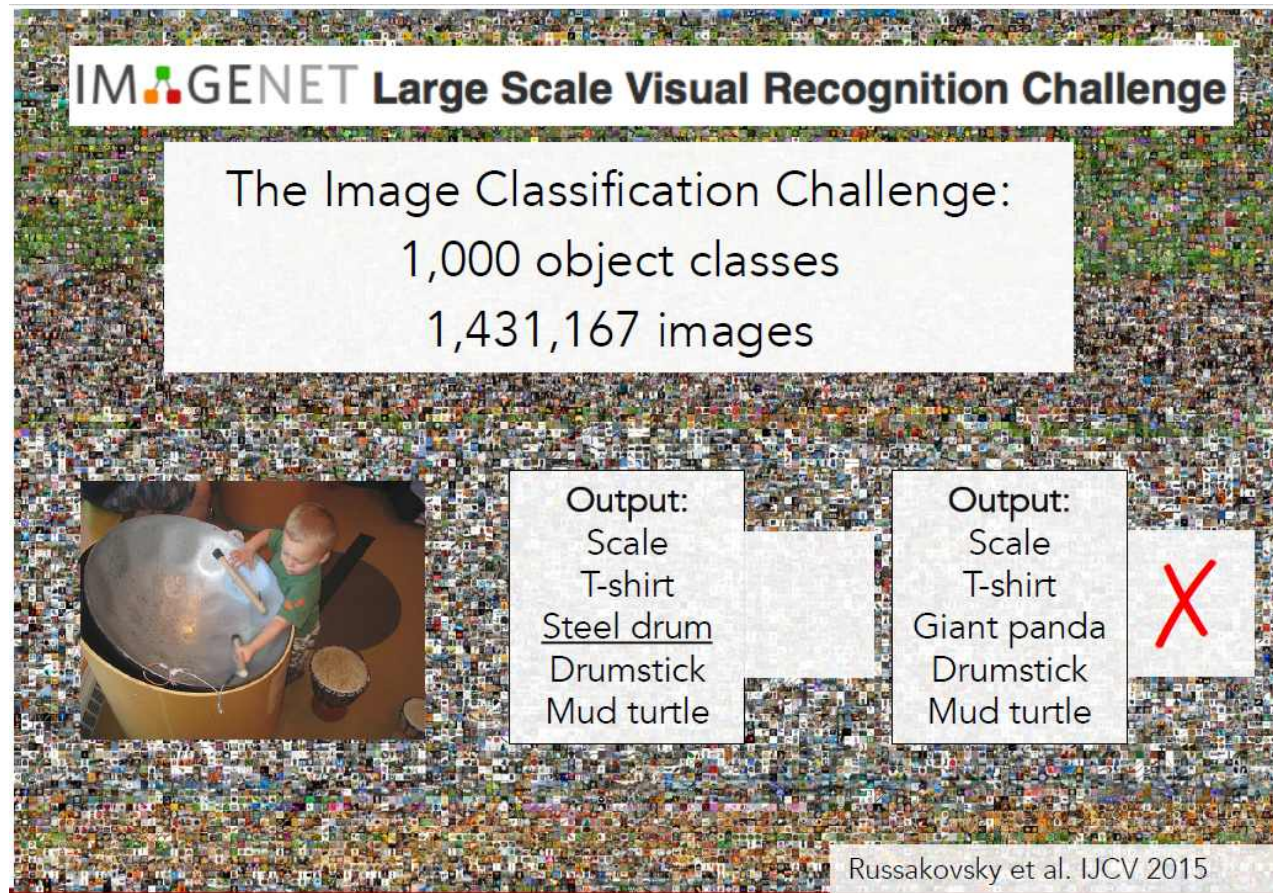
Computer Vision

- AI & Computer Vision



Visual Recognition

- State of the art



IMAGENET Large Scale Visual Recognition Challenge

The Image Classification Challenge:
1,000 object classes
1,431,167 images

Output:
Scale
T-shirt
Steel drum
Drumstick
Mud turtle

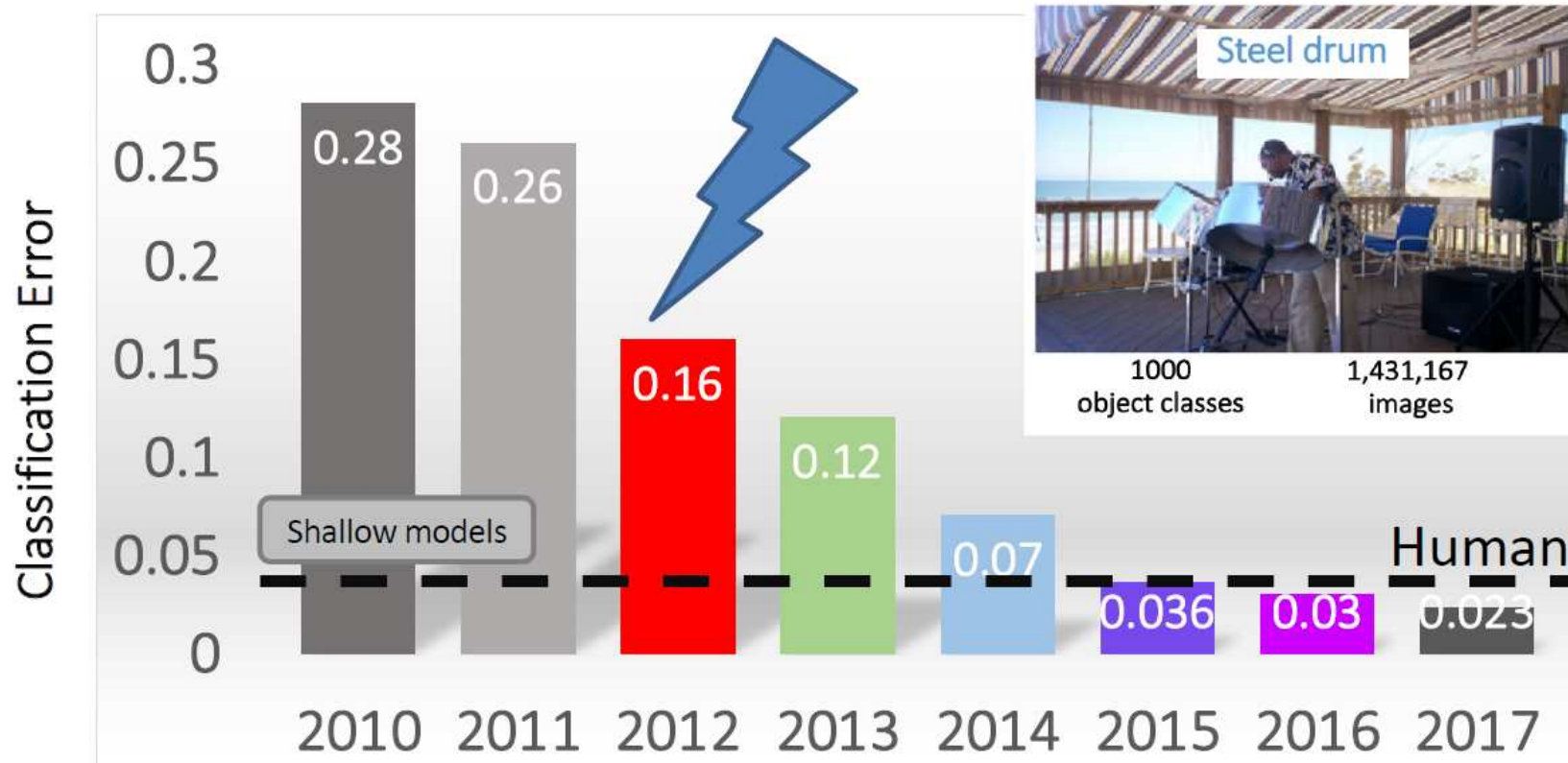
Output:
Scale
T-shirt
Giant panda
Drumstick
Mud turtle

Russakovsky et al. IJCV 2015

The slide features a background of a dense mosaic of small images. A central white box contains the challenge's name and statistics. Below this, a photograph of a child playing a steel drum is shown. To the right of the photo are two boxes: the first lists the correct classification output for the image, with 'Steel drum' underlined; the second lists an incorrect output, with a large red 'X' to its right.

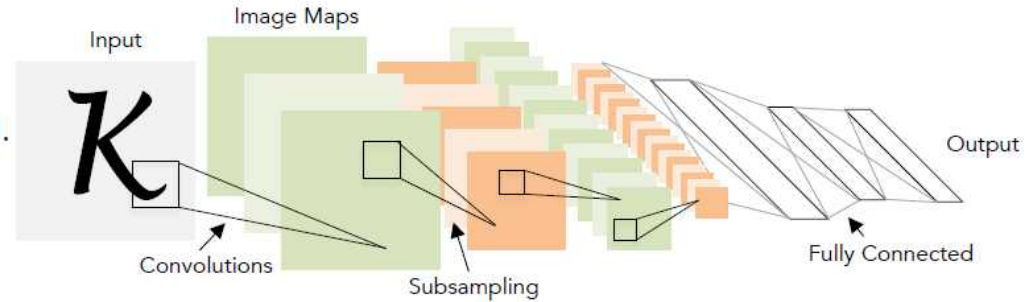
Visual Recognition

- State of the art



Visual Recognition

1998
LeCun et al.



of transistors

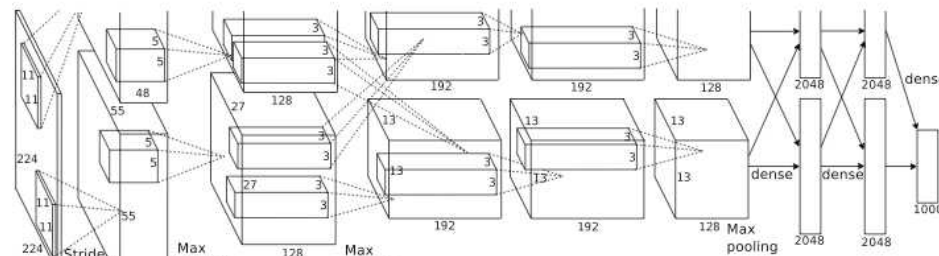


10^6

of pixels used in training

10^7 **NIST**

2012
Krizhevsky et al.



of transistors GPUs



10^9



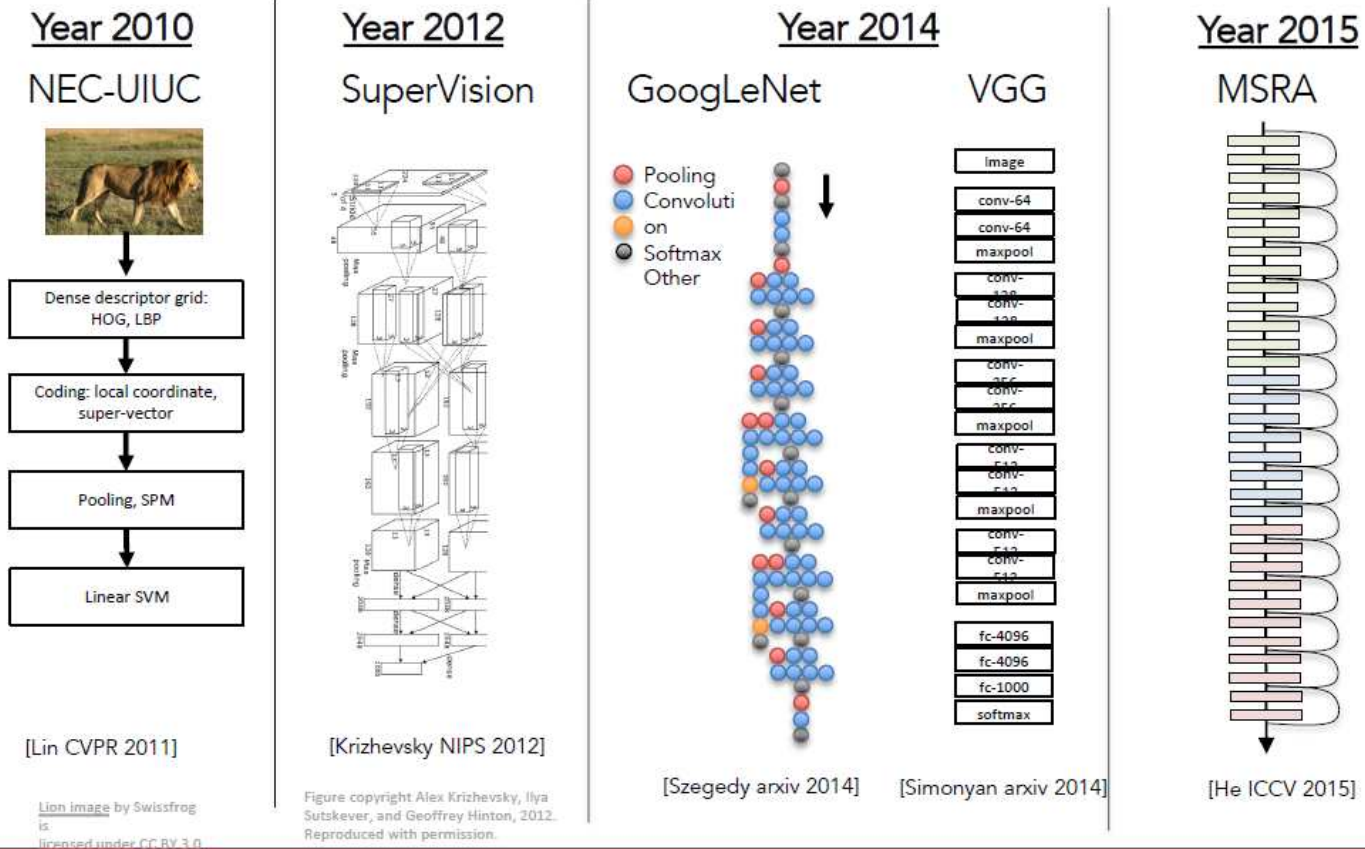
of pixels used in training

10^{14} **IMAGENET**

Figure copyright Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton, 2012. Reproduced with permission.

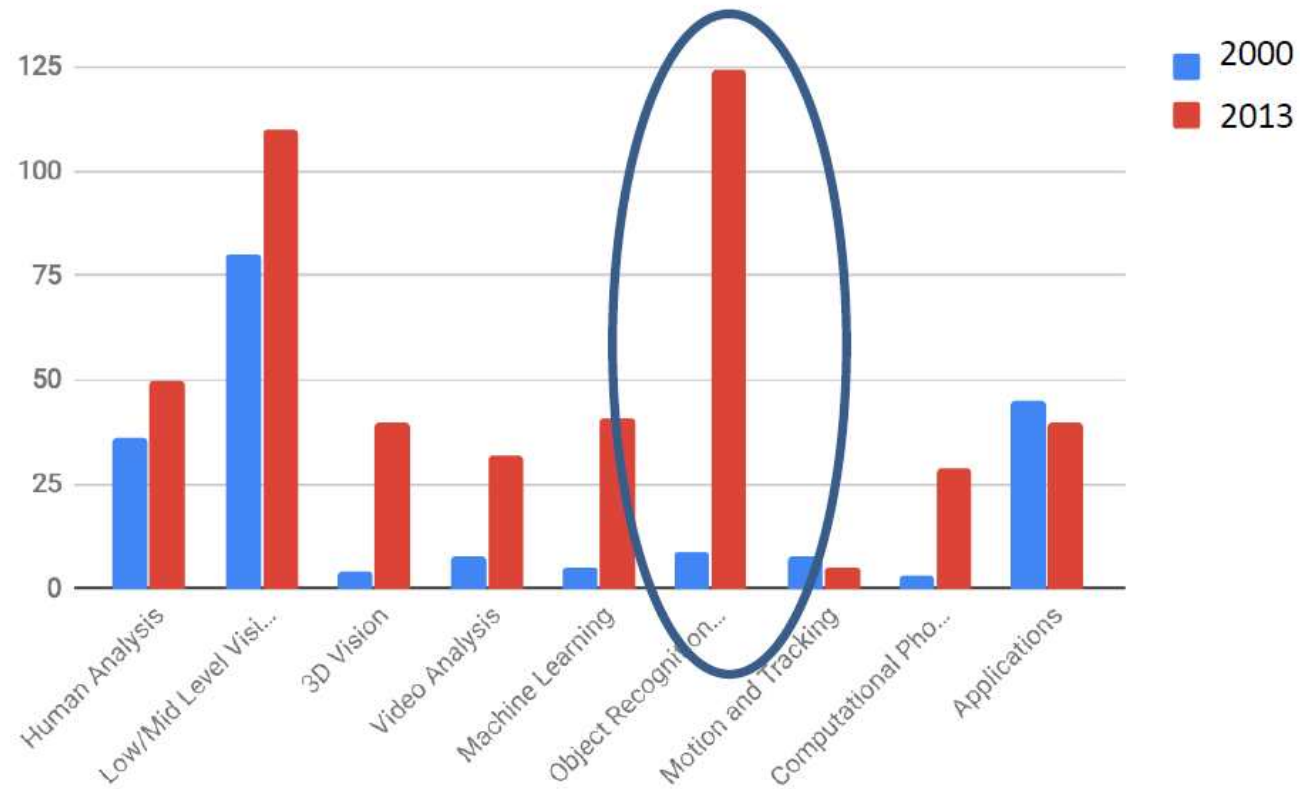
Visual Recognition

IMAGENET Large Scale Visual Recognition Challenge

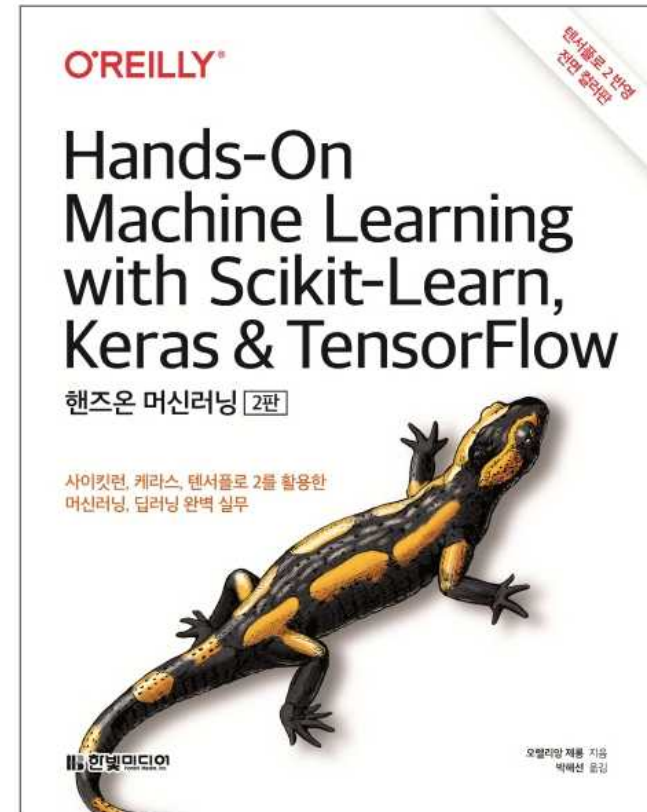
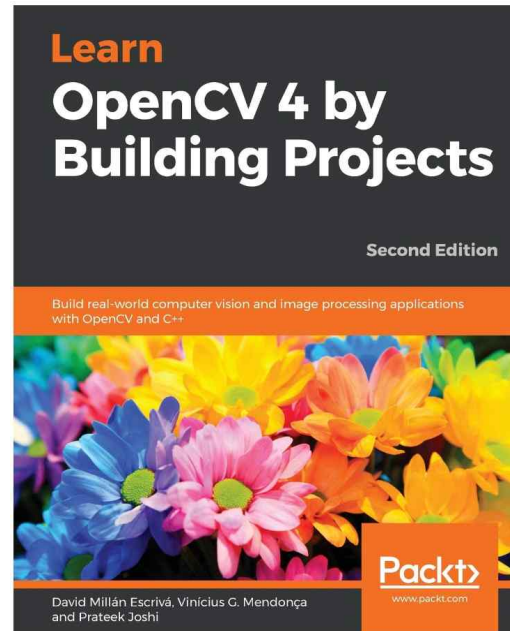


Visual Recognition

CVPR topic distribution: 2000 vs. 2013



교재



강의개요

주차	수업내용	교재범위 및 과제물	비고
1	강의 개요		
2	OpenCV 개요	C++ & OpenCV	
3	특징추출 & 매칭 1	C++ & OpenCV	
4	특징추출 & 매칭 2	C++ & OpenCV	
5	머신러닝 & 비전 인식 1	C++ & OpenCV	
6	머신러닝 & 비전 인식 2	C++ & OpenCV	
7	머신러닝 & 비전 인식 3	C++ & OpenCV	
8	프로젝트 1	C++ & OpenCV	
9	딥러닝 1	Python	
10	딥러닝 2	Python	
11	합성곱 신경망 1	Python	
12	합성곱 신경망 2	Python	
13	비전 인식 응용 1	C++ & OpenCV & Python	
14	비전 인식 응용 2	C++ & OpenCV & Python	
15	프로젝트 2	C++ & OpenCV & Python	

평가

- 과제: 100%
 - HW : 30~40 %
 - Projects : 60~70 %

* 지각/결석은 감점