COMPUTER VISION

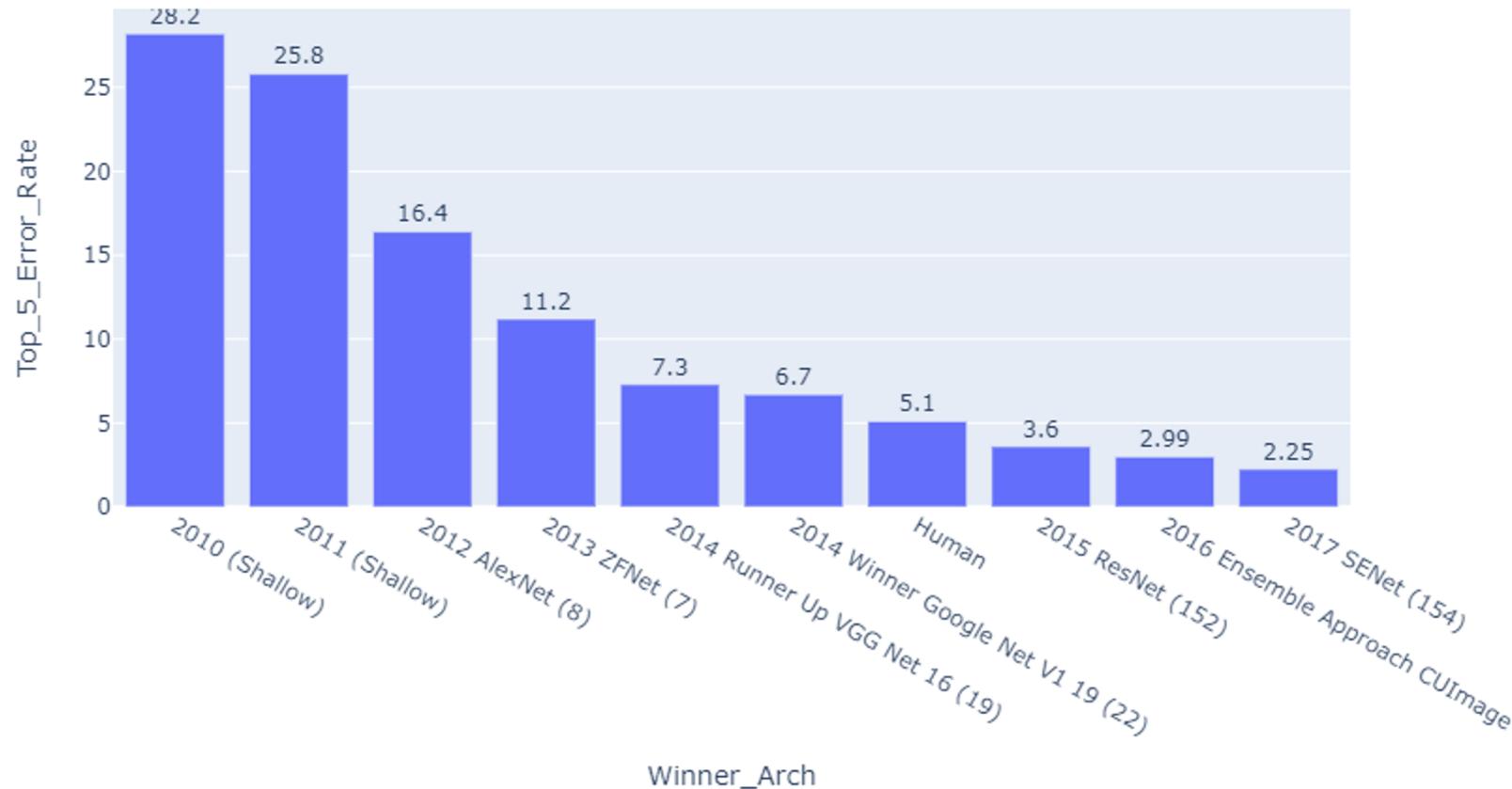## COMPARISON BETWEEN CNN ARCHITECTURES

Agenda

This video lecture focuses on understanding:

- Evolution of architectures w.r.t. Year, depth, and error rate

- Compare various architectures w.r.t. accuracy, number of parameters (computation), and memory.

- Compare various architectures w.r.t number of parameters (computation) and accuracy.

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1. Evolution of architectures w.r.t. Year, depth, and error rate

ILSVRC 2010-2017

2. Compare various architectures

Architecture	Type	Top-5 Accuracy	No. of parameters	FLOP	Size (disk space)
AlexNet	Shallow	84.6%	62 M	1.5B	~238MB
VGG Net (16)	Deep	90.0%	138 M	19.6B	~530MB
Google Net V1(19)	Deep	~89%	6 M	2B	-
ResNet(152)	Very Deep	94.3%	60M	11B	~219 MB
MobileNet V1	Deep	89.9%	4.2M	~569M	~16.9 MB
Efficient Net-B1	Very Deep	94.5%	7.8 M	0.7B	-

3. Compare various architectures

Architecture	Year	Top-1 Accuracy	No. of parameters (in millions)
AlexNet	2012	63.3 %	62 M
VGG Net (16)	2014	74.4 %	138 M
Google Net V2(19)	2015	74.8 %	11.2 M
ResNet(152)	2015	78.57 %	60M
DenseNet-264	2016	77.85 %	22 M
MobileNet V1	2017	70.9%	4.2M
Efficient Net-B1	2019	78.8%	7.8 M
Meta Pseudo Labels	2021	90.2 %	480 M

Summary

- CNNs have made a rapid progress in the last ~8 years.

- In 2012, Alexnet scored 63.3% Top-1 accuracy on ImageNet. Now, there are architectures with over 90% accuracy.

- MobileNet and Efficient Net versions are primarily used for mobile applications and embedded systems.

- ResNet and DenseNet give high accuracy but they are computationally expensive.

- We also observed that more parameters do not always guarantee more accuracy.