

Deep Learning

Dr. Shahira Ahmed

DS710

Orientation Lecture





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Dive into Deep Learning

by

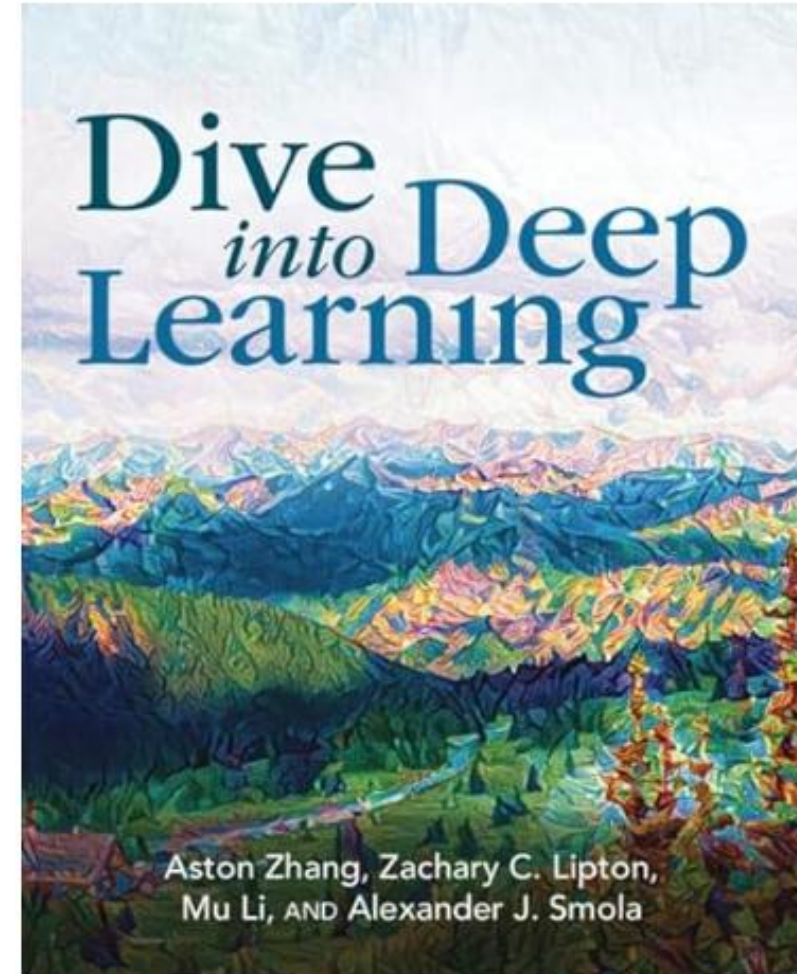
Aston Zhang

Zachary C. Lipton

Mu Li

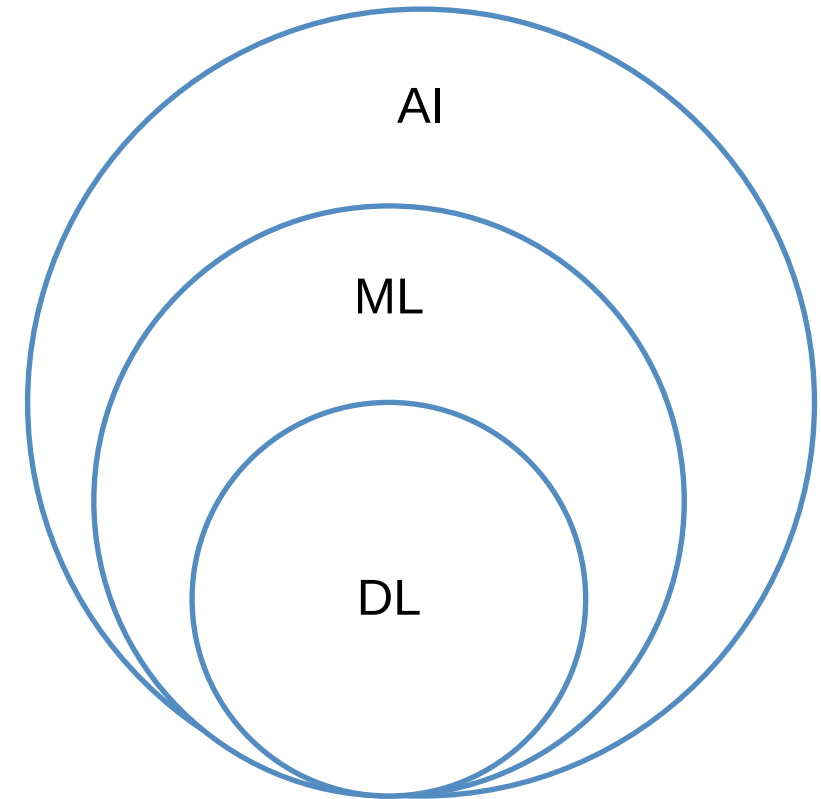
Alexander J. Smola.

<https://d2l.ai/>



What is Deep Learning?

- Deep learning is a class of machine learning algorithm that uses multiple stacked layers of processing units to learn high-level representations from unstructured data.
- Deep Learning involves taking large volumes of structured or unstructured data and using complex algorithms to train neural networks.

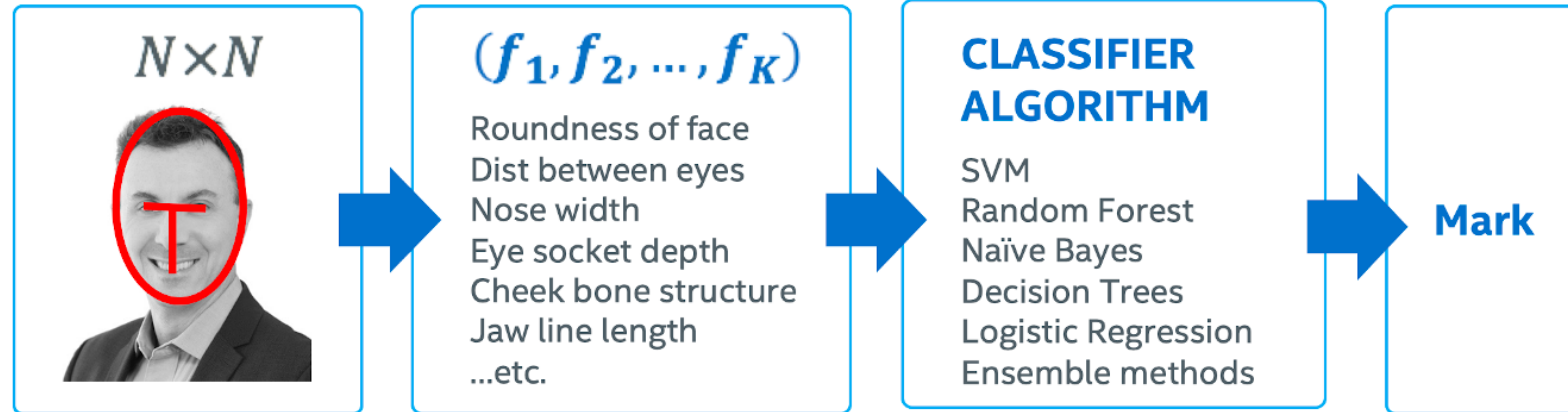


Structured vs Unstructured Data

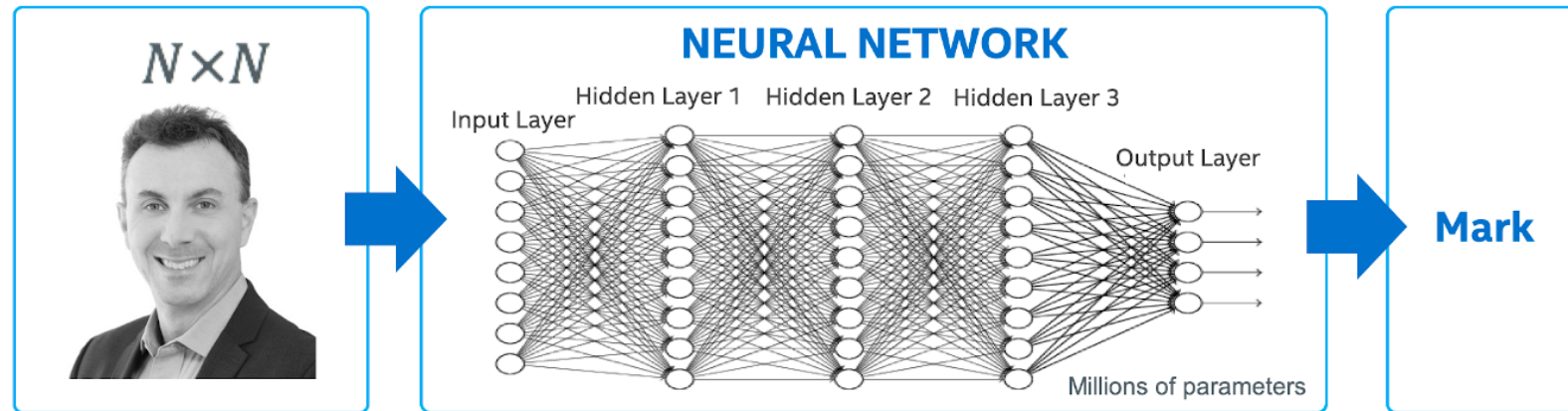
STRUCTURED DATA				
id	age	gender	height (cm)	location
0001	54	M	186	London
0002	35	F	166	New York
0003	62	F	170	Amsterdam
0004	23	M	164	London
0005	25	M	180	Cairo
0006	29	F	181	Beijing
0007	46	M	172	Chicago

UNSTRUCTURED DATA		
		This service is terrible!
		Your website is great!
images	audio	text

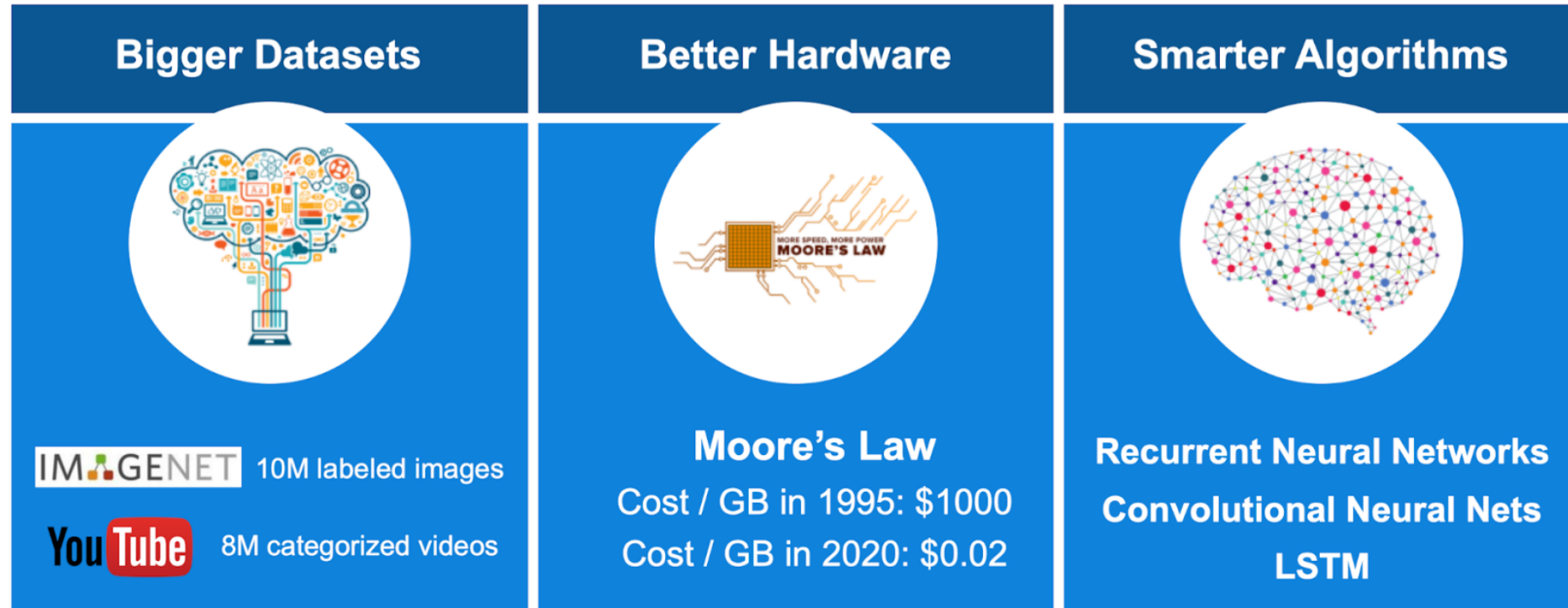
Classic Machine Learning



Deep Learning

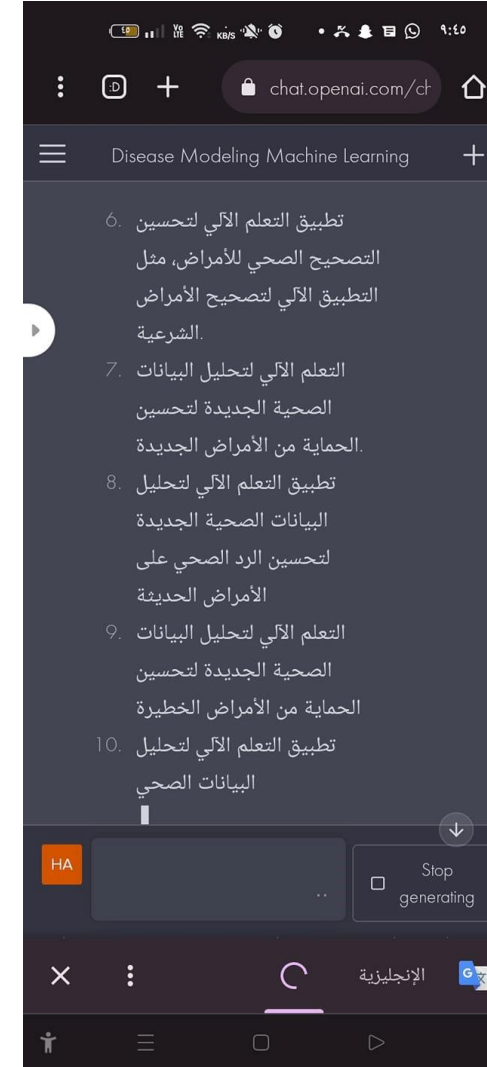
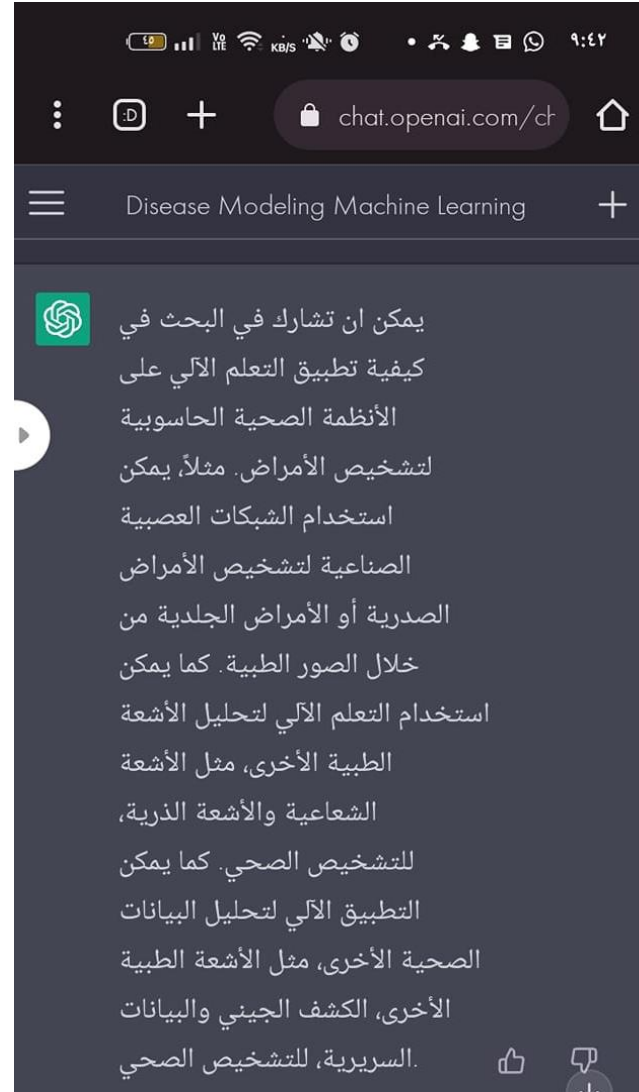
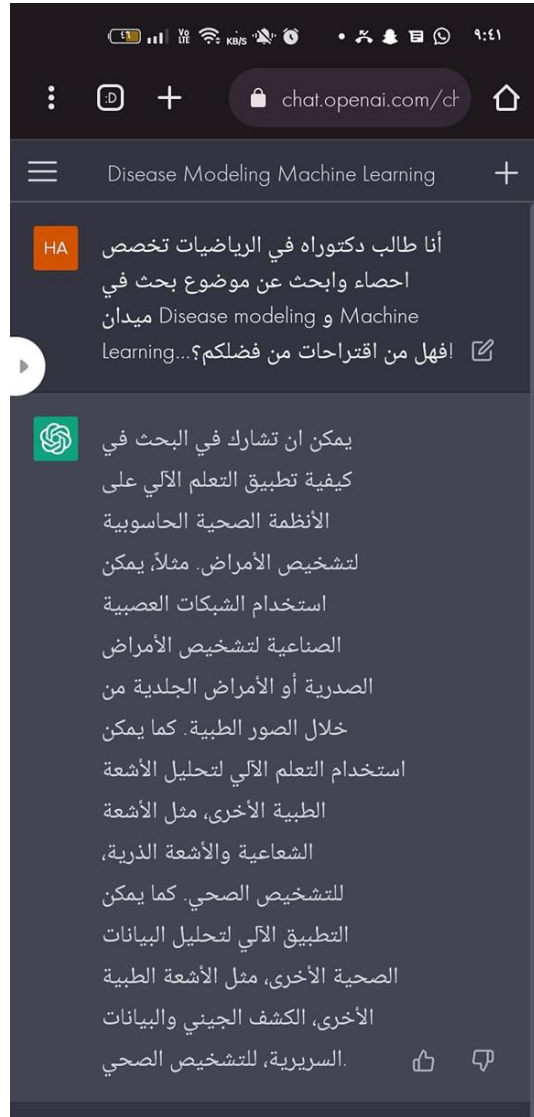


Why now?



- for image classification, the key breakthrough came in 2012 when a team led by Geoff Hinton at the University of Toronto won the ImageNet Large Scale Visual Recognition Challenge (ILSVRC) with a deep convolutional neural network.
- The competition involves classifying images into one of a thousand categories and issued as a benchmark to compare the latest state-of-the-art techniques. The deep learning model had an error rate of 16%—a massive improvement on the next best model, which only achieved a 26.2% error rate.
- The 2015 winner achieved superhuman performance for the first time, with an error rate of 4%, and the current state-of-the-art model achieves an error rate of just 2%.









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