

IE 643

Deep learning - Theory & Practice

→ Course project - 40%

→ teams of size 1 or 2

→ Preparatory

CVPR

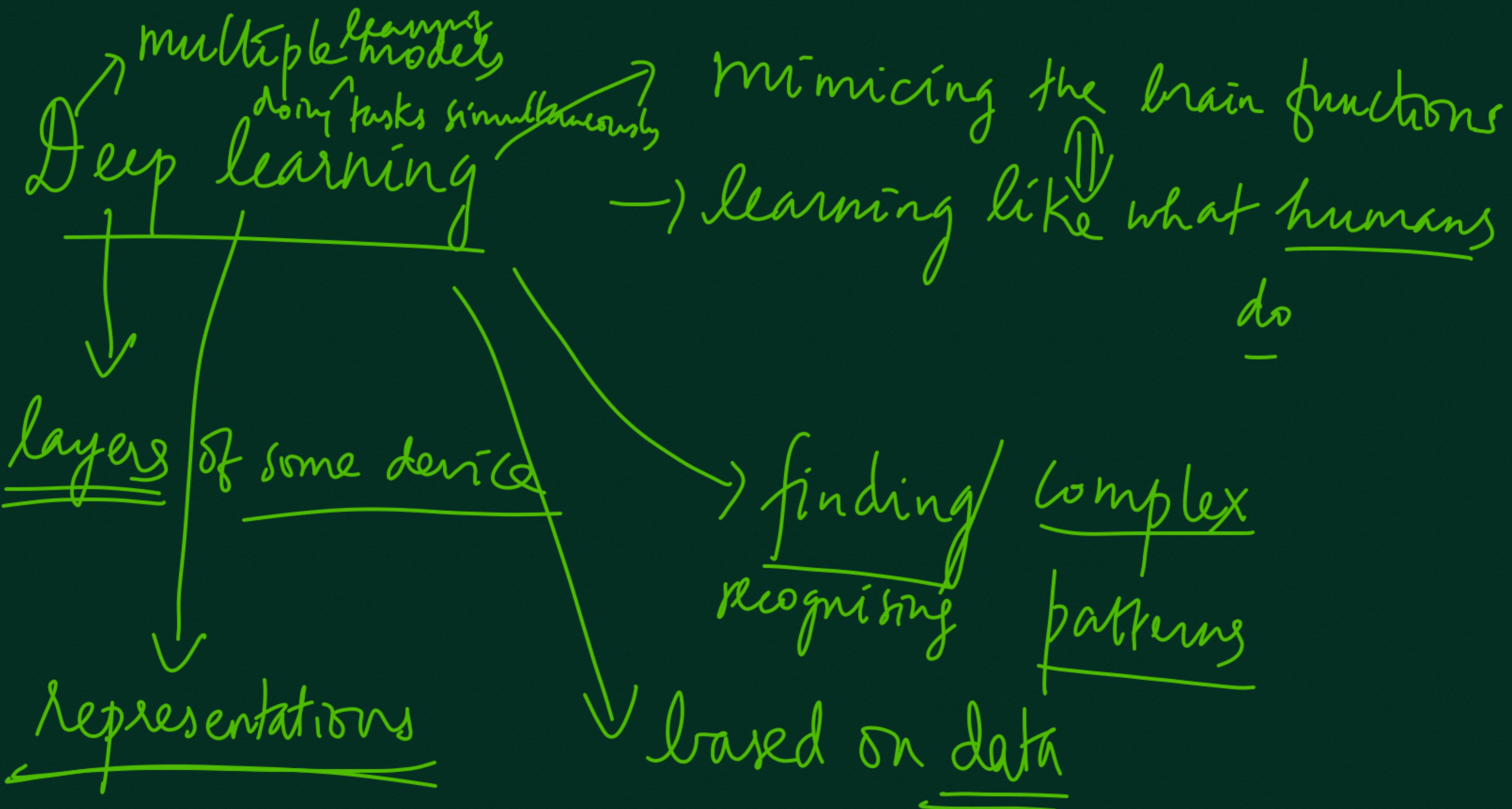
→ Continuous + main

ACL

→ novelty

ICASSP /
INTERSPEECH

ICML / Neurips / ICLR



Applications: Process optimization Protein structures
Speech / emotion recognition

NLP

Chatgpt

Image recognition/object detection
in images

drug repurposing

Trading

rec. systems

Games

optimal transport

Anomaly detection
Predictive maintenance of
machines

Convolution → images.

→ trading
speech
music
NLP

Transformers → translation



Perceptrons

→ Circuit Theorists

→ Classification

↳ To classify a data into two or more predesigned classes

Ex: Spam filters

to classify an email
into spam / not spam

Cat

dog


classify a customer

loan
borrower
will
not
borrow

Image classification

to classify an image into
one of the object categories

classifying CT scan image
into cancerous/non-cancerous

music genre

classify a piece of music

into pop
ghazal

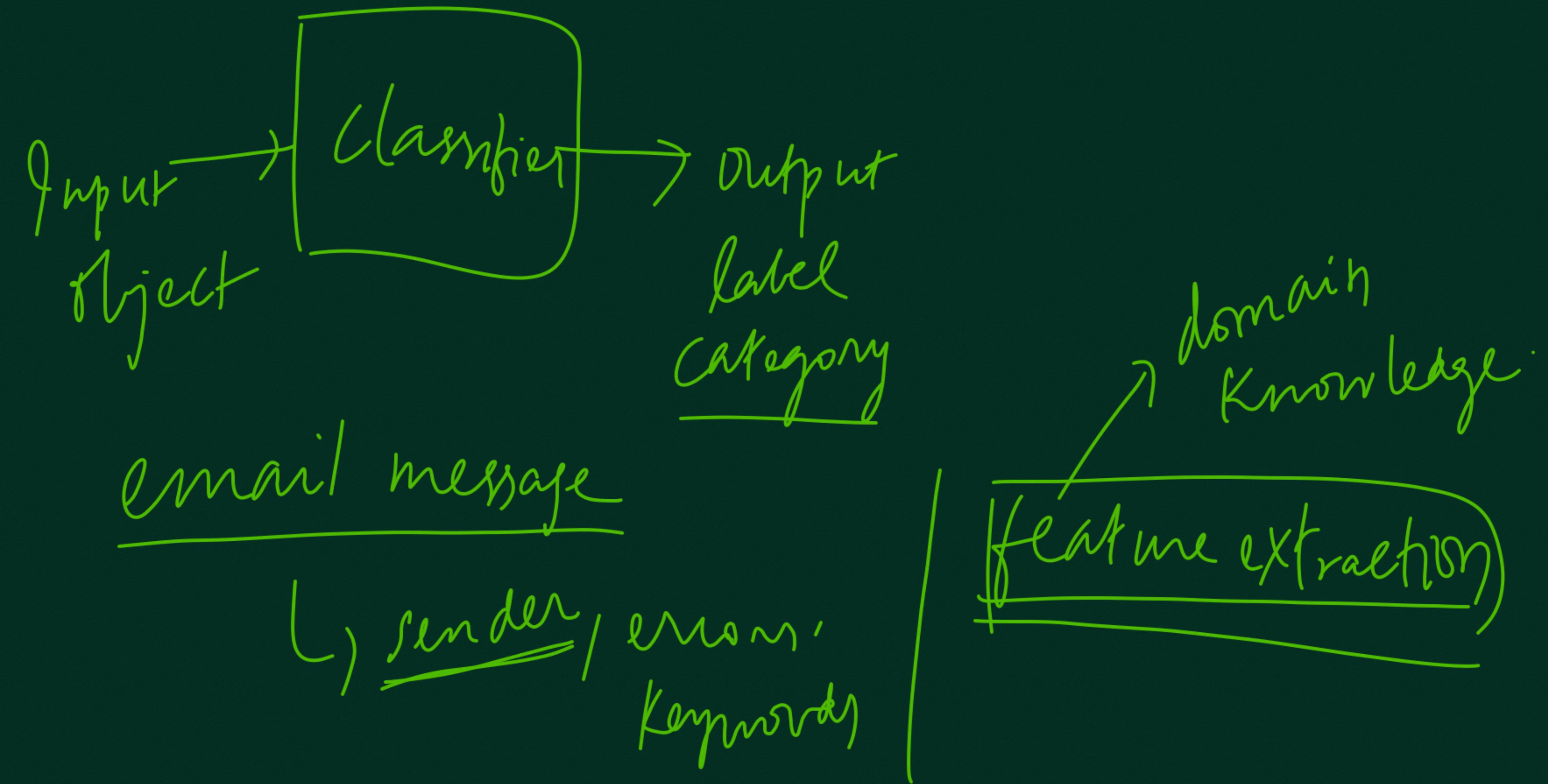
Classify data related to environment
into rainy
sunny.

Sentiment analysis
Clarify sentence

angry happy

Classify location

no wind farm
wind farm



Input object

$$\boxed{DC} \in X \rightarrow \tilde{x} \in \tilde{X}$$

individual
data
item
e.g. email msg

Set / space
containing
the input objects

$$x \in \mathcal{X} \subseteq \mathbb{R}^d$$

Vector/
matrix/
tensor
:

$$\subseteq \mathbb{R}^{m \times n}$$

mnist