

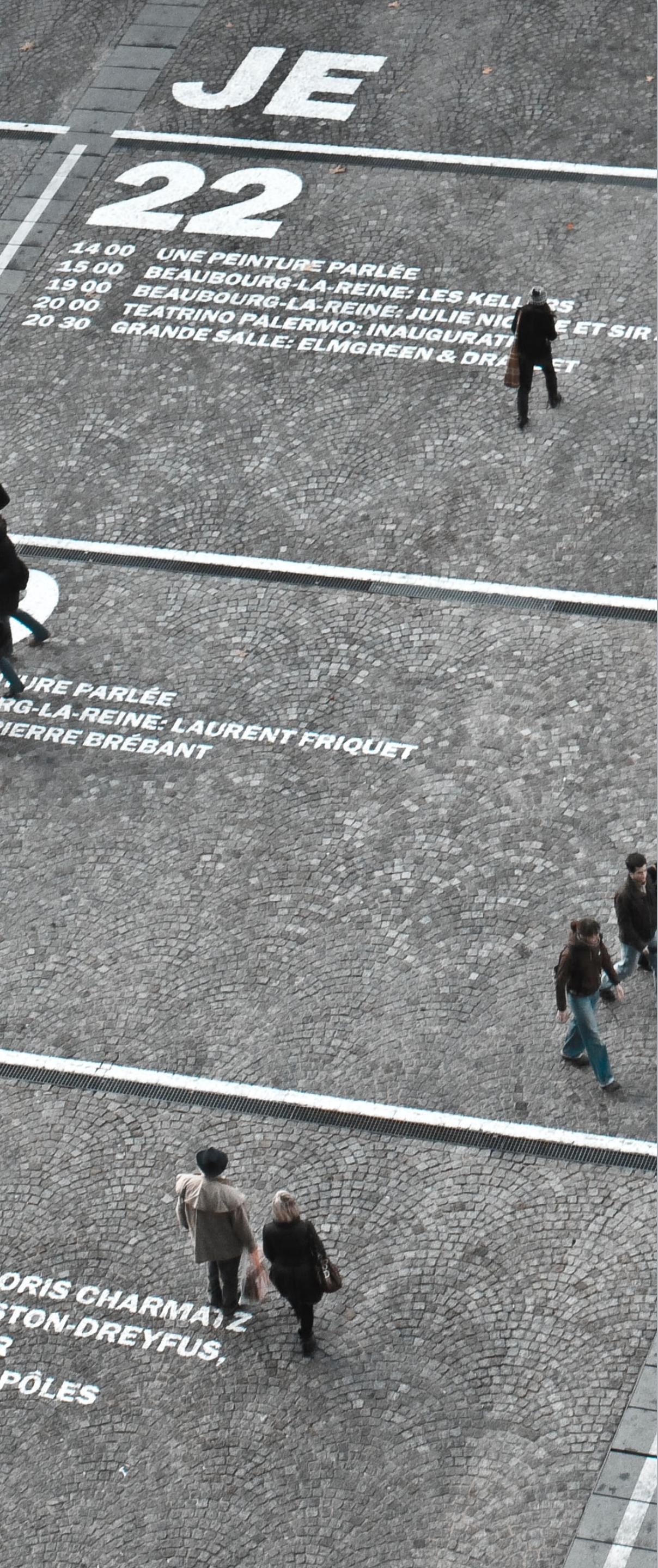


NATURAL LANGUAGE PROCESSING

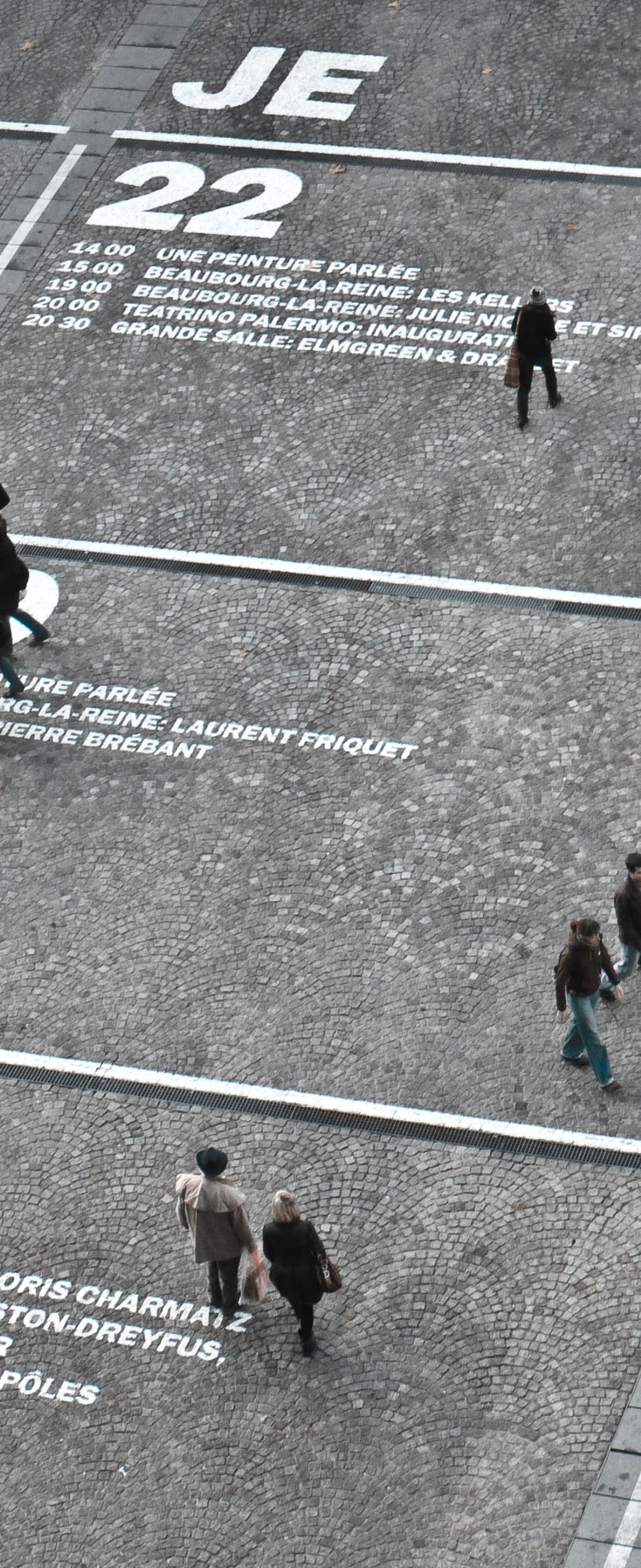
MACHINE-DEEP LEARNING APPLICATIONS

Designed by : KRISHNAV DAVE





Embeddings ?



NATURAL LANGUAGE PROCESSING

MACHINE-DEEP LEARNING APPLICATIONS

COUNT BASED

Frequency table of the words with respect their occurrence.

TF IDF

Term Frequency = word / total words
IDF = Log (N Docs/Word in doc)

PREDICTION BASED

SkipGram: Many to 1 NN prediction
CBOW: 1 to many NN prediction

CUSTOMISED

GLOVE, ELMO and highly customised embeddings can be developed

CO-OCCURENCE

Interaction table on how many times words come together.



Types of embeddings

Nor will the Arab pitch his tent there,
Nor will shepherds make their flocks
lie down there. Is. 14:23; 34:10-15
21 But desert creatures will lie down
there. Is. 34:11-15; Zeph. 2:14; Rev. 18:2
And their houses will be full of owls,
Ostriches also will live there, and
shaggy goats will frolic there.
And hyenas will howl in their fortified
towers howling creatures
And jackals in their luxurious palaces.
Her *fateful* time also will soon come
A few days will not be prolonged.

TER 14

HEI... have compassion on
them, and let those Israel, and settle
in their own land, then strangers will
gather, and attach themselves to the
house of Ps. 102:13 · Is. 41:8; 9; 44:1
2 A... will take them along
and bring them into place, and the house
Isra... given as an inheritance
the lan... male servants and
the se... they will take their
rule over their op...
their captives
it will... the Lord
you're fro... turmoil
and harsh service n...
enslaved Ezra 9:8
4 that you will take up
the king of Babylon, and say,
How the oppressor has ceased,
and how fury has ceased! Is. 9:4
5 The Lord has broken the staff of the
wicked,
The scepter of rulers
6 Which used to strike the peoples in
fury with unceasing strokes,
Which subdued the nations in anger
with unrestrained persecution.
7 The whole earth is at rest and is quiet;
They break forth into shouts of joy.
8 Even the cypress trees rejoice over
you, and the cedars of Lebanon,
saying, Is. 55:12; Ezek. 31:16
Since you were laid low, no tree cutter
comes up against us.
9 Sheol from beneath is excited over you
to meet you when you come;
It arouses for you the spirits of the
dead, all the leaders of the earth;
It raises all the kings of the nations
from their thrones. male goats
They will all respond and say to you,
Even you have been made weak as we,
You have become like us. Ezek. 32:21
Your pomp and the music of your
harps Is. 5:14
Have been brought down to Sheol;
Bones are spread out as your bed be-
neath you,
Worms are your covering.'

12 "How you have fallen from hea-
O star of the morning, son of the
You have been cut down to the
You who have weakened the
13 "But you said in your heart,
'I will ascend to heaven;
I will raise my throne above
of God.' Dan. 5:22; 23; 8:10; 2
And I will sit on the mount of a
In the recesses of the north,
14 'I will ascend above the high
clouds;
I will make myself like the Mo-
15 "Nevertheless you will be thru-
to Sheol. Ezek. 28:8
To the recesses of the pit.
16 "Those who see you will gaze at
They will ponder over you, sa-
'Is this the man who made them
tremble, show themselves
Who shook kingdoms,
17 Who made the world like a w-
And overthrew its cities,
Who did not allow his prison
home?' Joel 2:3 · Is. 4
18 "All the kings of the nations lie
Each in his own tomb,
19 "But you have been cast out
tomb
Like a rejected branch,
Clothed with the slain who ar-
with a sword, an abh-
Who go down to the stones of
Like a trampled corpse.
20 "You will not be united with
burial,
Because you have ruined you.
You have slain your people.
May the offspring of evildoers
mentioned forever. J
21 "Prepare for his sons a place
ter
Because of the iniquity of the
They must not arise and take
sion of the earth Ex. 20:
And fill the face of the w-
cities."
22 "And I will rise up against t-
clares the Lord of hosts, "and v-
from Babylon name and survivors
and posterity," declares the Lord.
23 "I will also make it a possess-
hedgehog, and swamps of water,
sweep it with the broom of destru-
clares the Lord of hosts. Zeph.

Prophecies Against Assyria
and who in Judah
shall lay claim
to the land?
24 The Lord of hosts has sw-
"Surely, just as I have intended
happened, and just as I have pla-
will stand, Job 23:13; [Is. 46:11; 55:8
25 to break Assyria in My land
trample him on My mountains.
yoke will be removed from their
burden removed from their shoul-

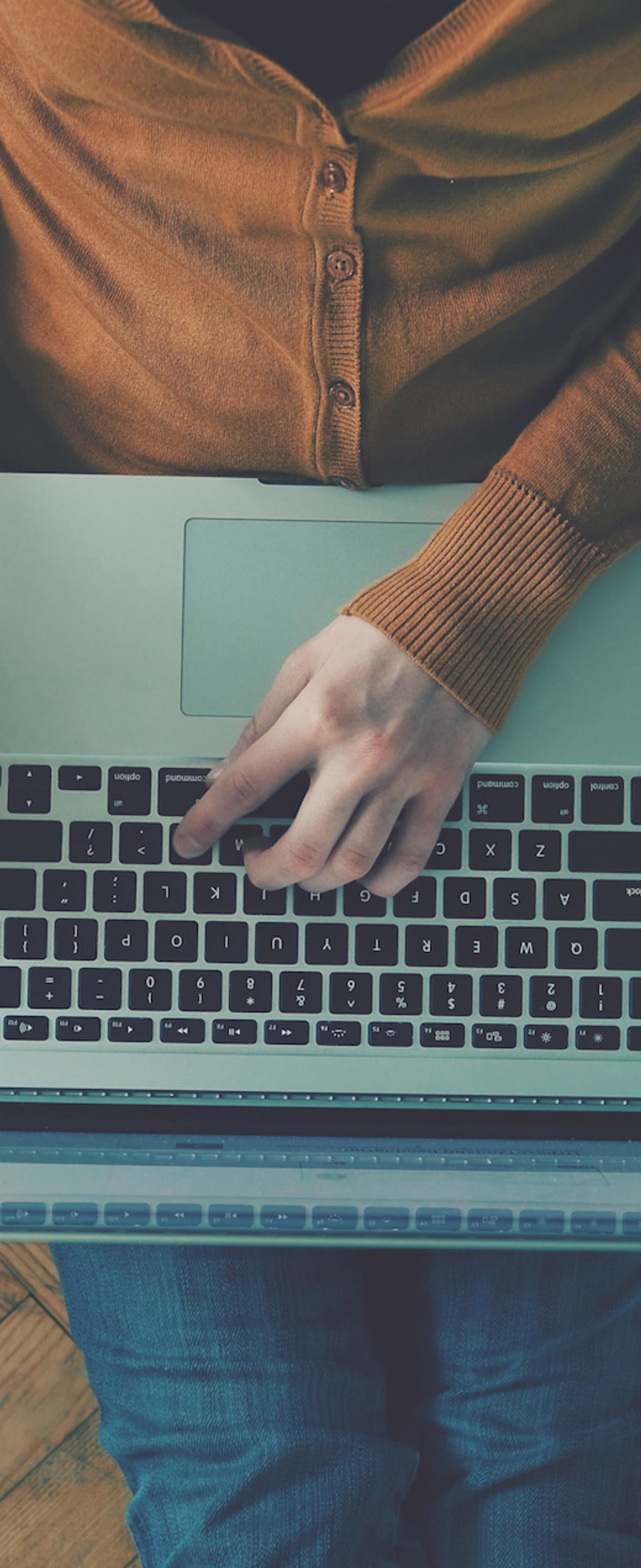
scroll to find answer

Aujourd'hui, j'utilise un document d'un dossier de mon ordinateur pour vous montrer comment fonctionnent les réseaux LSTM. Le virus Corona se propage rapidement en France. Il a été trouvé pour la première fois en CHINA dans le DISTRICT DE

Data that has roots or dependencies with its predecessors is considered as sequential data.

Example: English language, time series data etc.

2 SEQUENTIAL DATA



NATURAL LANGUAGE PROCESSING

MACHINE-DEEP LEARNING APPLICATIONS

DATASET

Dataset needs predictor features and the target feature.

PREPROCESSING

Convert words/letters/sentences into numeric data.

EVALUATION

Tough and non exposed testing data is needed to validate

CONCLUSION

Machine learning can be used when we need to classify but not generate data

MODELS

Supervised learning classification model can be used to classify.

3 TRADITIONAL ML



"Demonstration"

CASE STUDY 1

Fake news classifier. ML based model which detects if the link of news is real or fake

CASE STUDY 2

Support chat bot. ML based chat bot session which talks to users and provides assistance

2 **ML CASE STUDIES**



NEURAL NETWORKS

Topics, case studies, examples shown to the learners should be generic or non industry specific or should be easy to infer

LSTM - ENCODE DECODE

Cases studies perfectly inclined towards the theoretical material. Publications and blogs exposure.

RNN

Build the concept from scratch such a way that even a entry level person can understand

GRU

Normality as an example is not followed in industry. CI-CD could be used to continuously improvise the model.

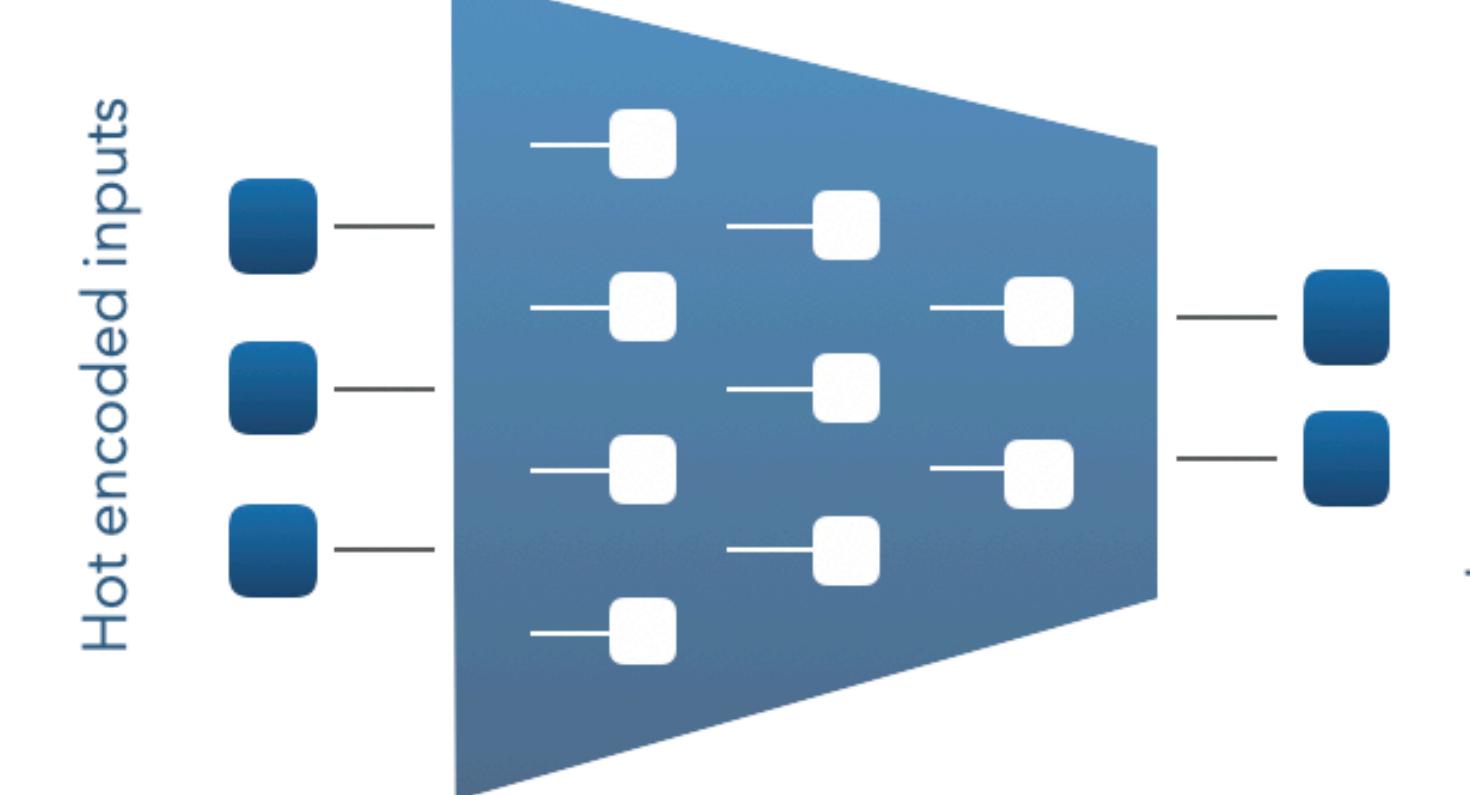
LSTM

Start the session from a high level application POV and then dive deep once learners get the gist

4 DEEP LEARNING

NEURAL NETWORKS

Neural network can be trained to identify or read words in a line but does not entertain a sequential data to predict the next word in the sentence as it has no memory of its own.





"Demonstration"

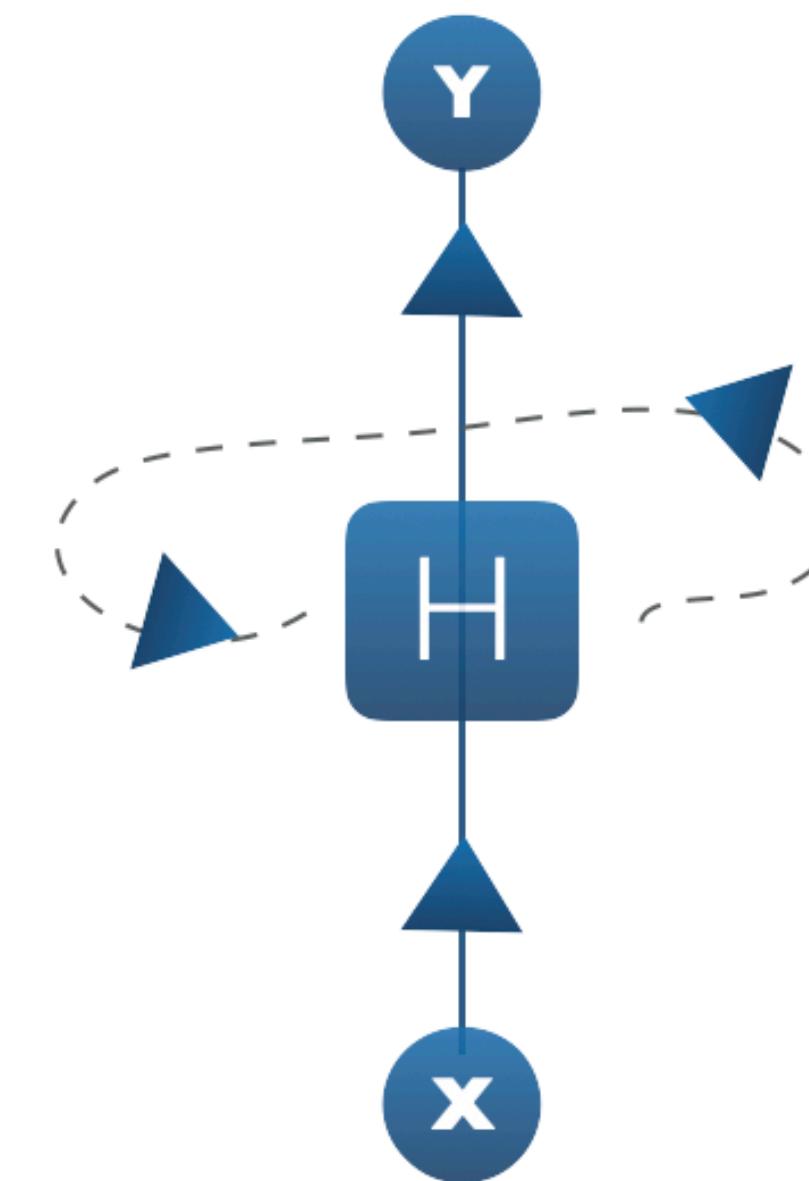
CASE STUDY 1

Support chat bot. ML based chat bot session which talks to users and provides assistance

1 DL CASE STUDY

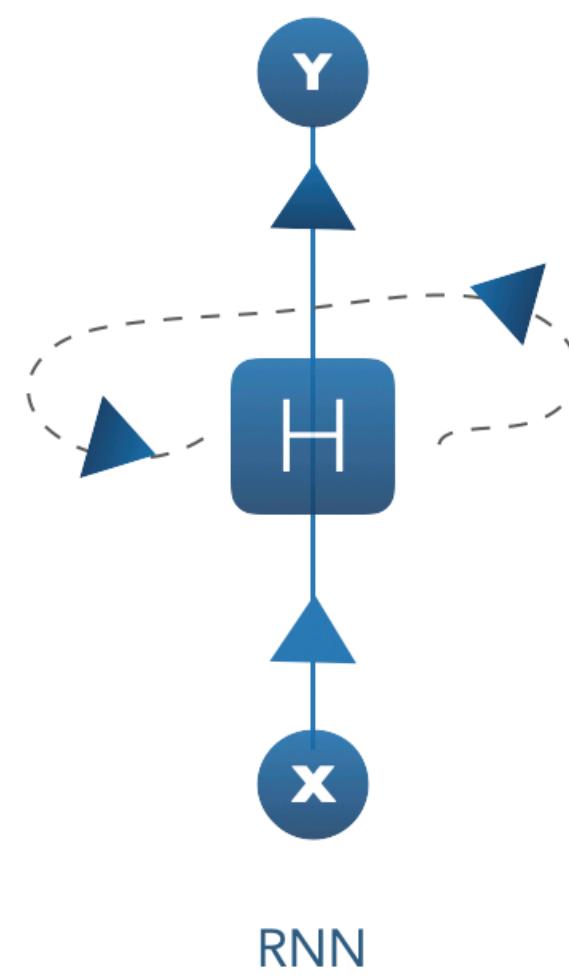
RECURRENT
NEURAL NETWORKS

RNN has an internal memory unit which can simulate an internal memory. It will pass the previous state to the next state. Can be used to predict words in the sentence.





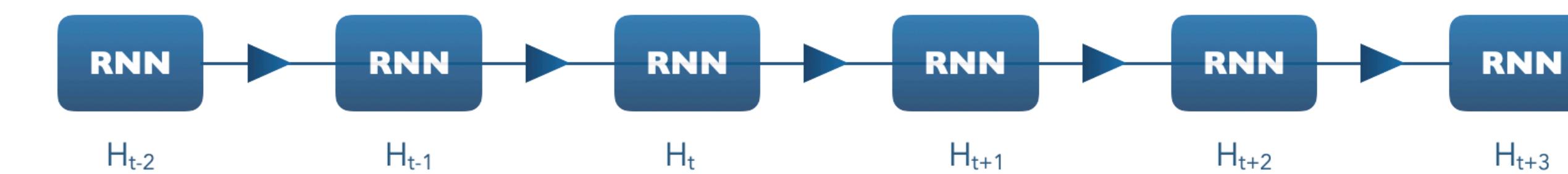
Introduction to RNN -



From diagram-

- H: Neural Networks hidden state [Input hidden weights, hidden state weights, output hidden state weights]
- X: Input
- Y: Output

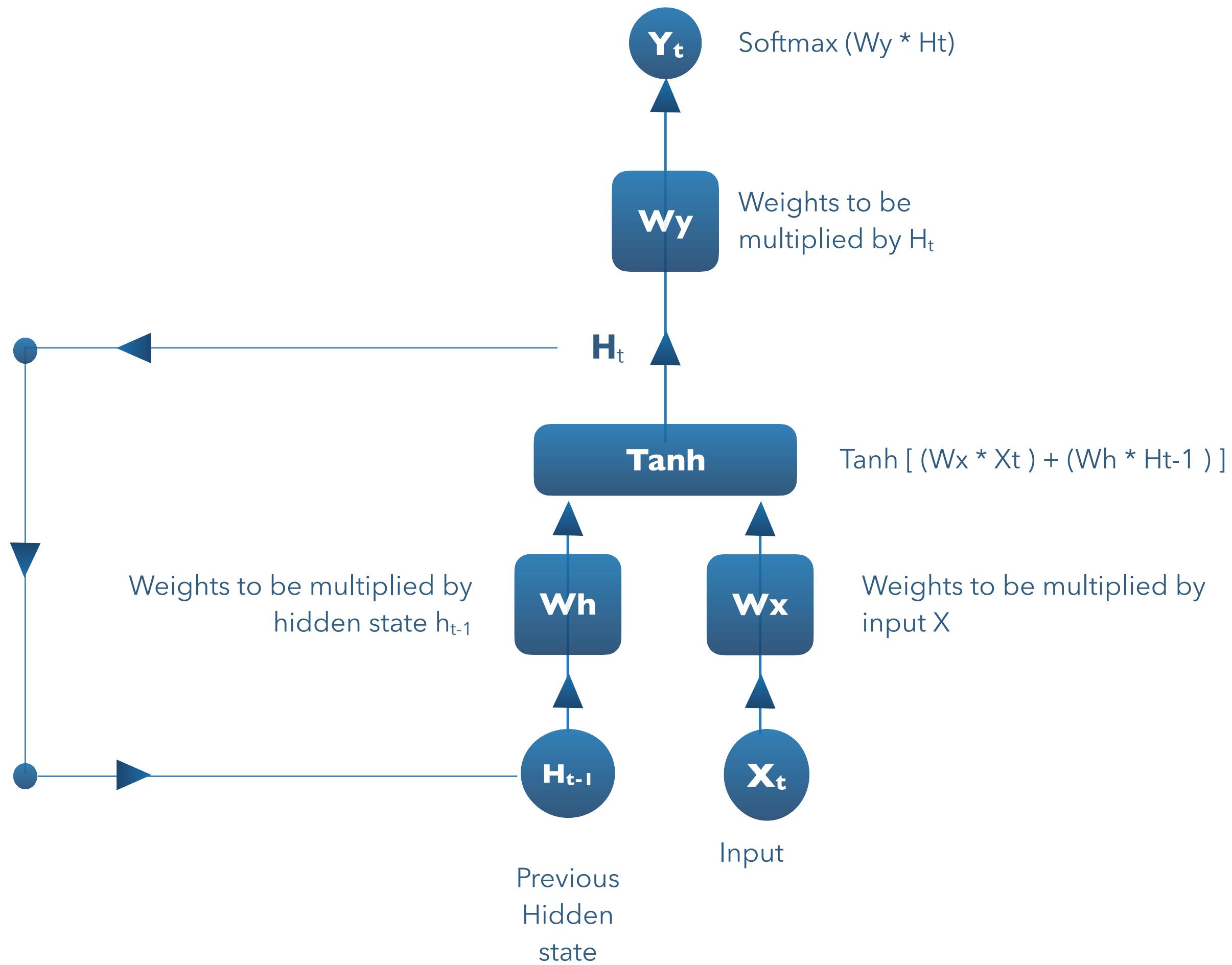
Time based network-





NATURAL LANGUAGE PROCESSING

MACHINE-DEEP LEARNING APPLICATIONS



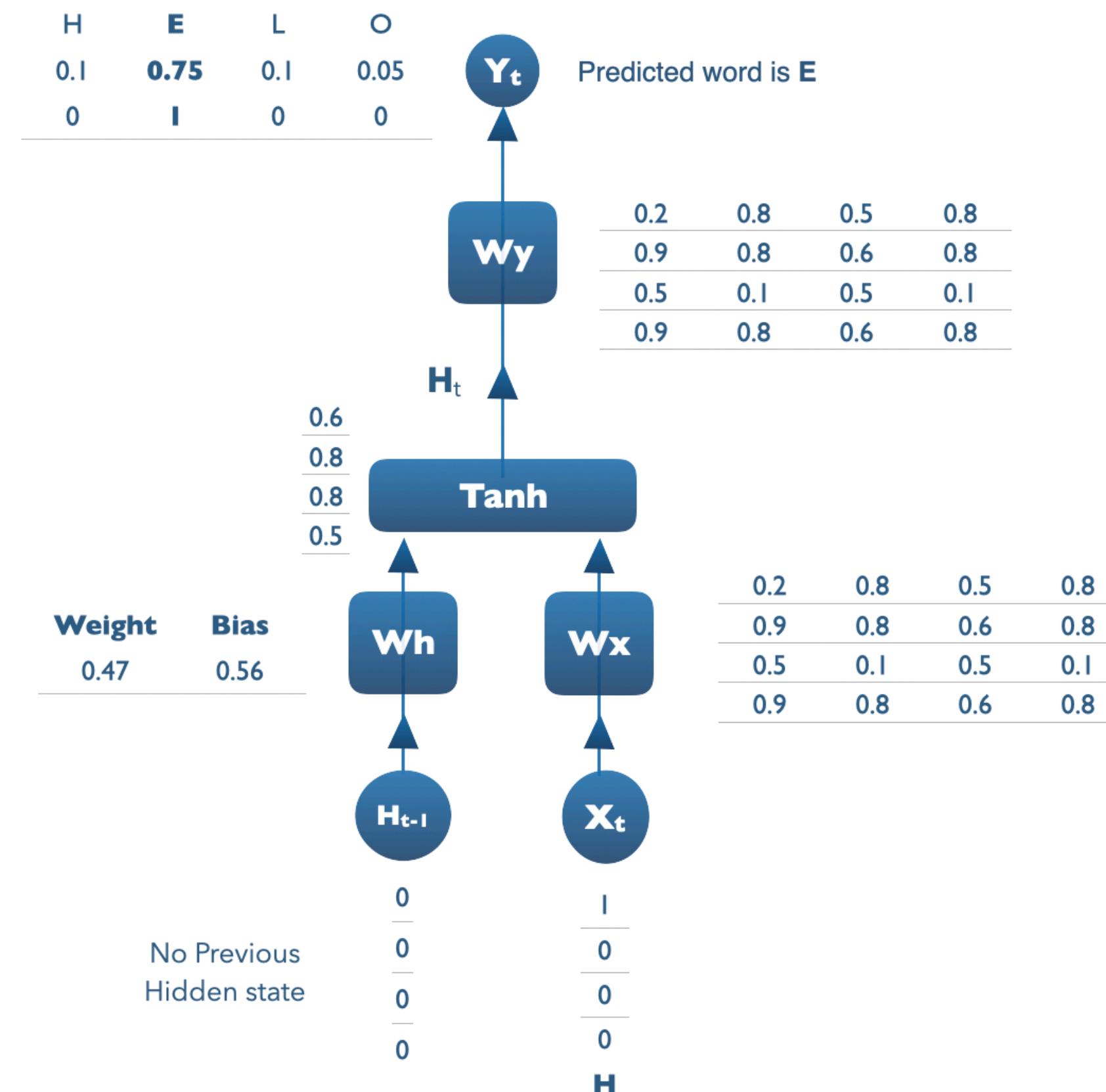


RNN Calculation -

- Use RNN to predict the next word in the word **HELLO**.
- The BOW will be { **H , E , L , O** }

Hot encoded input

H	E	L	O
1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1





"Demonstration"

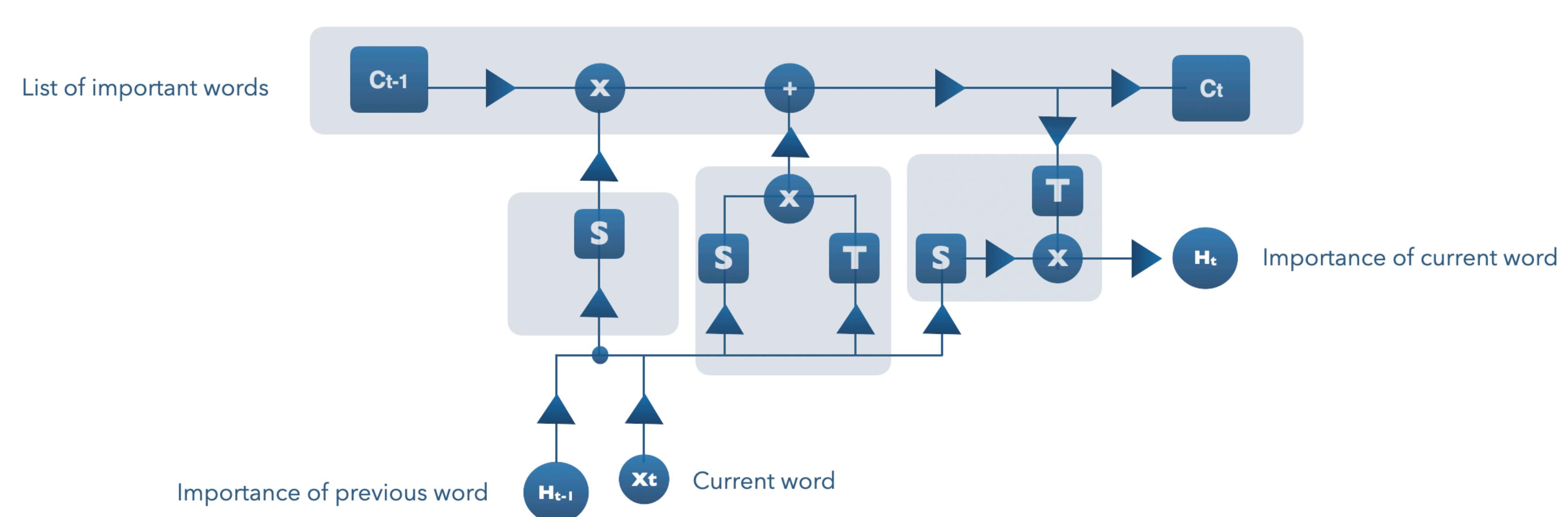
CASE STUDY 1

Tweeter content classifier using RNN.

1 RNN CASE STUDY

LONG SHORT TERM
MEMORY NETWORKS

LSTM has an internal memory unit which can simulate an internal memory. It will pass only the most important information to the next states. Hence it solves the problem of vanishing gradient.



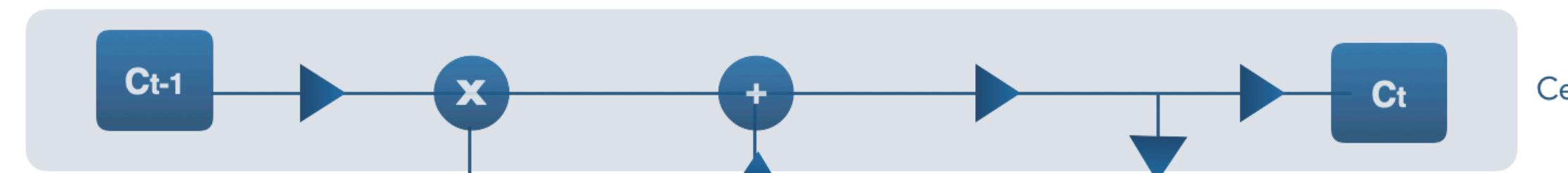


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Keeps a track to most important words in the sentence

Cell State



Cell State

Either allows or blocks the content to pass through

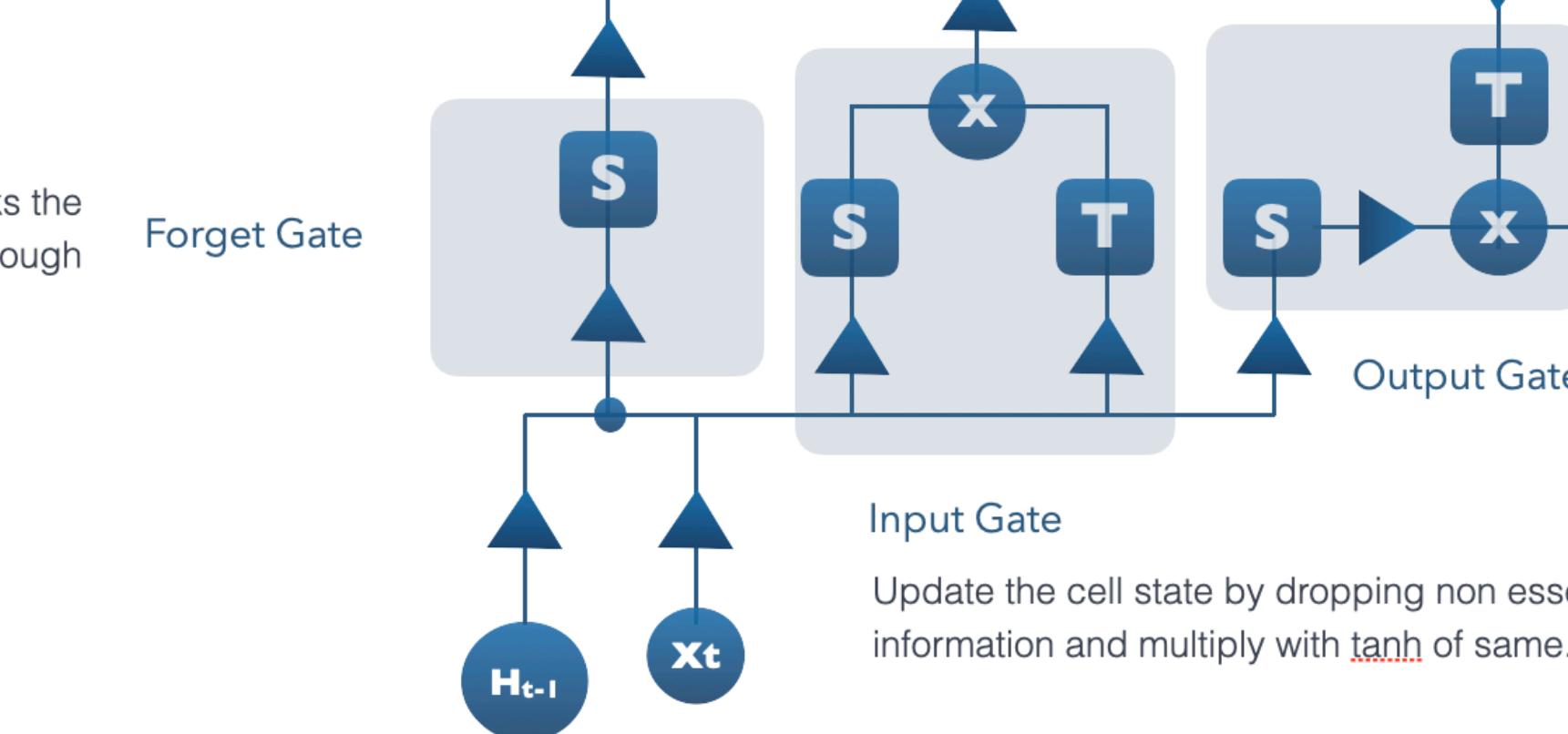
Forget Gate

Previous State

Hidden state word importance form the previous state

Input State

Input state word importance form the previous state



Output Gate

Hidden State

Hidden State

Hidden state word importance form the previous state

Produce hidden state by dropping non essential information and multiply with tanh of current cell state.

S

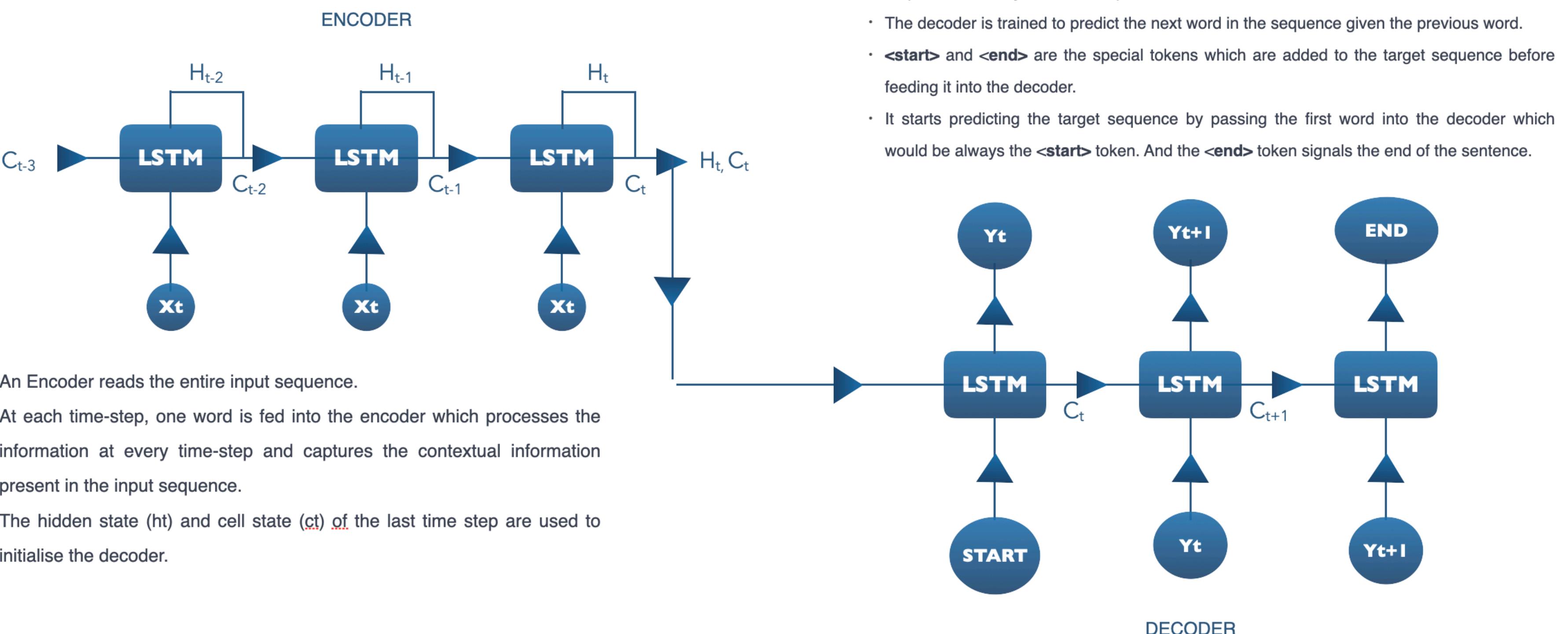
Sigmoid: 0 or 1

T

TanH: -1 to 1



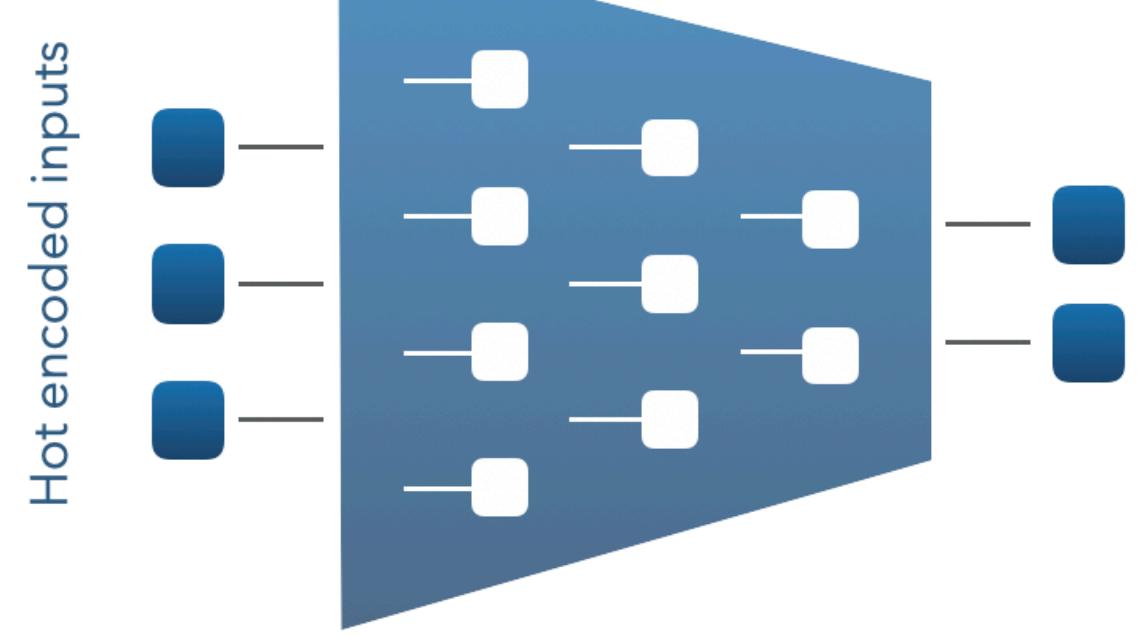
Sequence to Sequence Modelling Architecture:



- An Encoder reads the entire input sequence.
- At each time-step, one word is fed into the encoder which processes the information at every time-step and captures the contextual information present in the input sequence.
- The hidden state (h_t) and cell state (c_t) of the last time step are used to initialise the decoder.

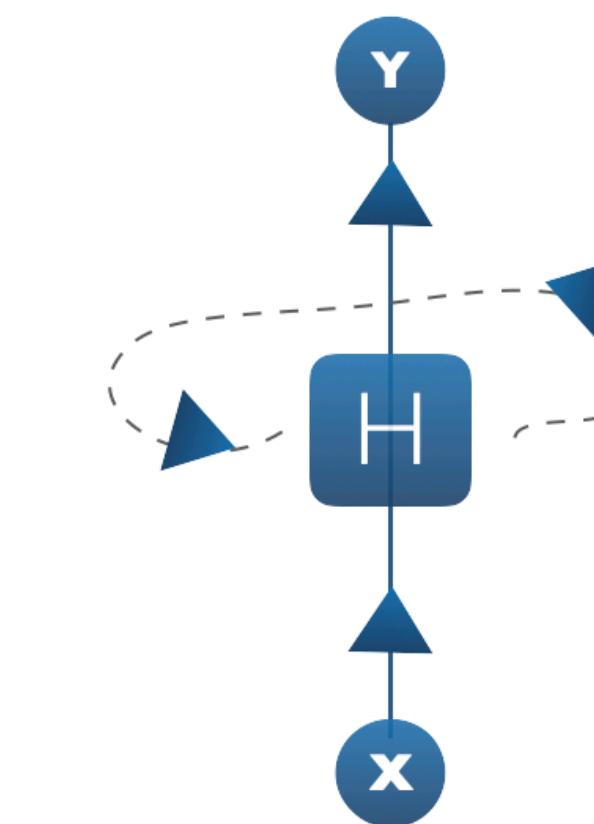
NATURAL LANGUAGE PROCESSING

MACHINE-DEEP LEARNING APPLICATIONS

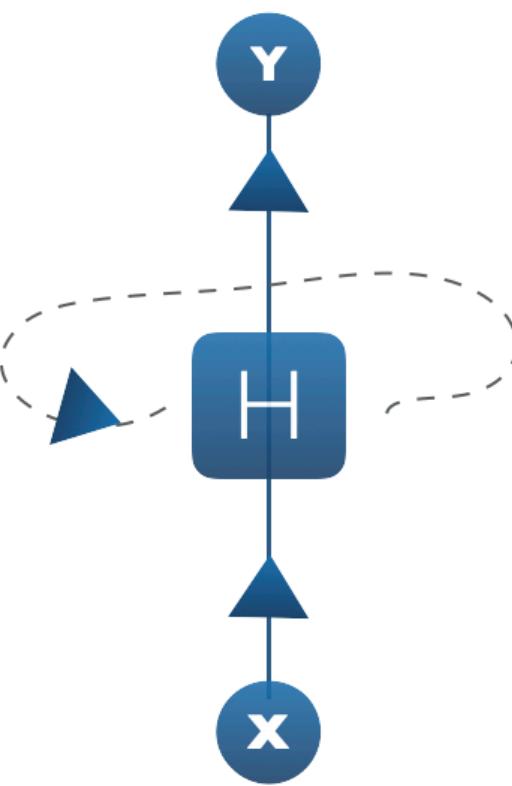


Neural network can be trained to identify or read words in a line but does not entertain a sequential data to predict the next word in the sentence as it has no memory of its own.

VS

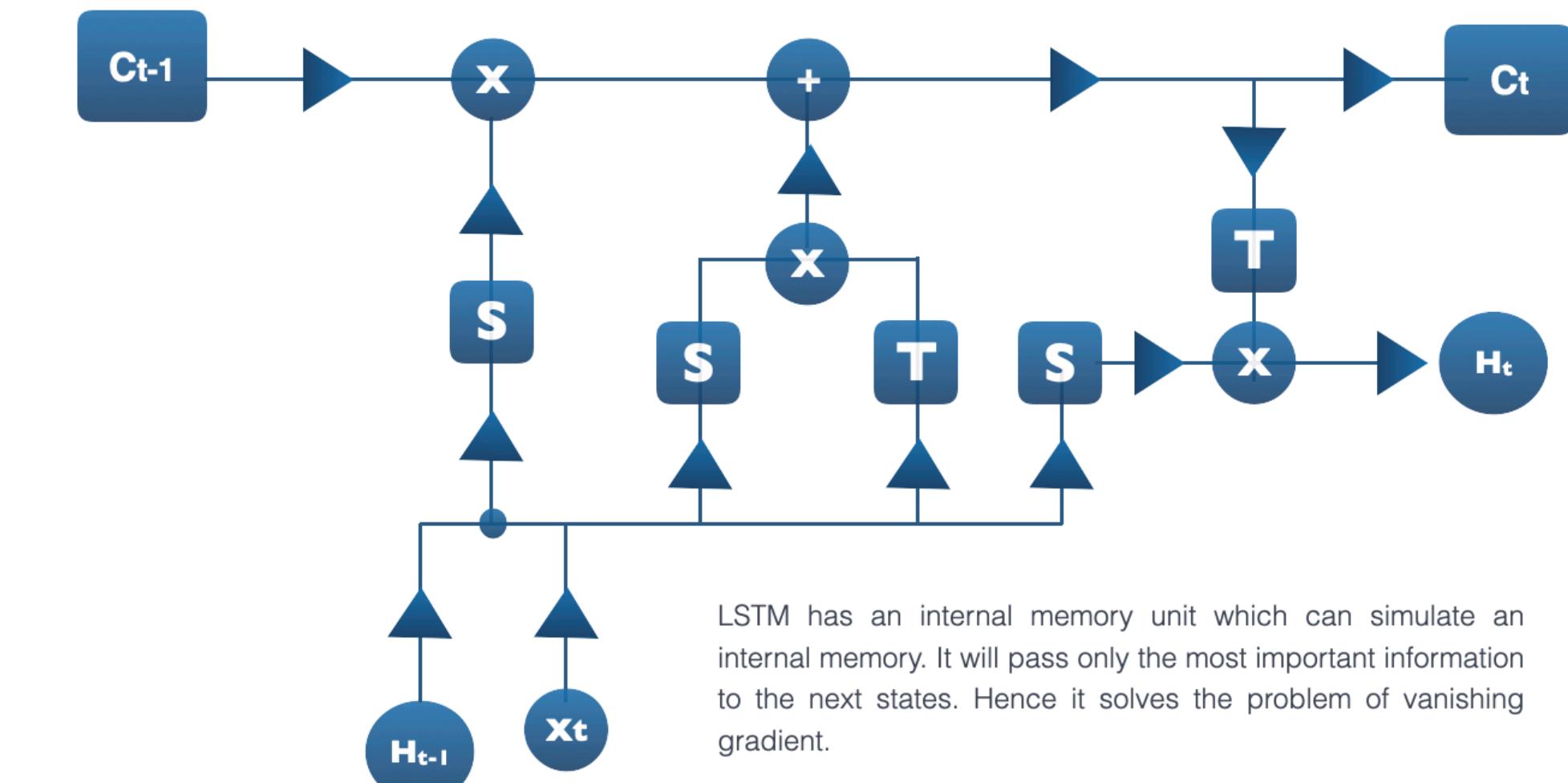


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Thank you



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