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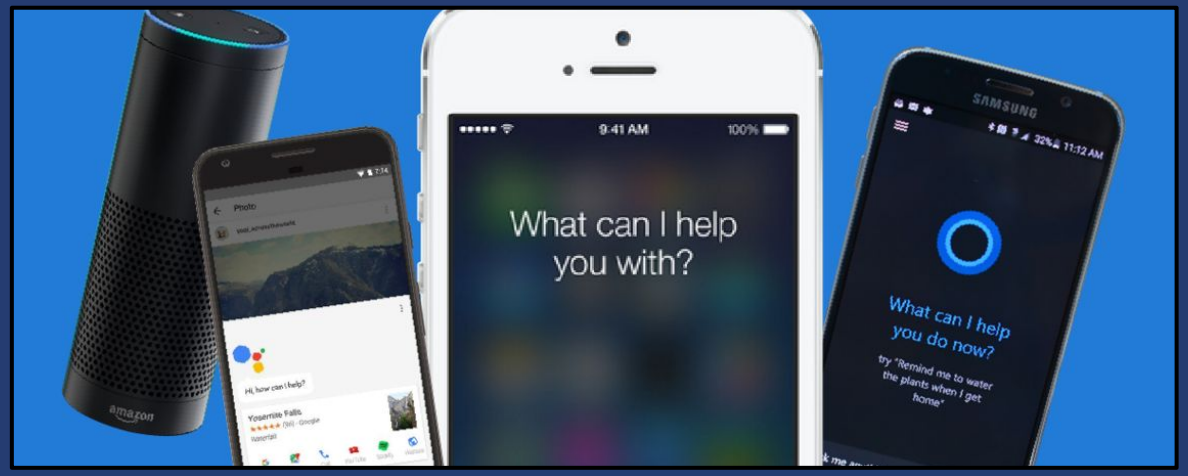
MACHINE LEARNING AND DATA ANALYTICS

Intro to NLP

Natural Language Processing (NLP)

What is NLP

A field of AI that gives machines the ability to read, understand and derive meaning from human languages

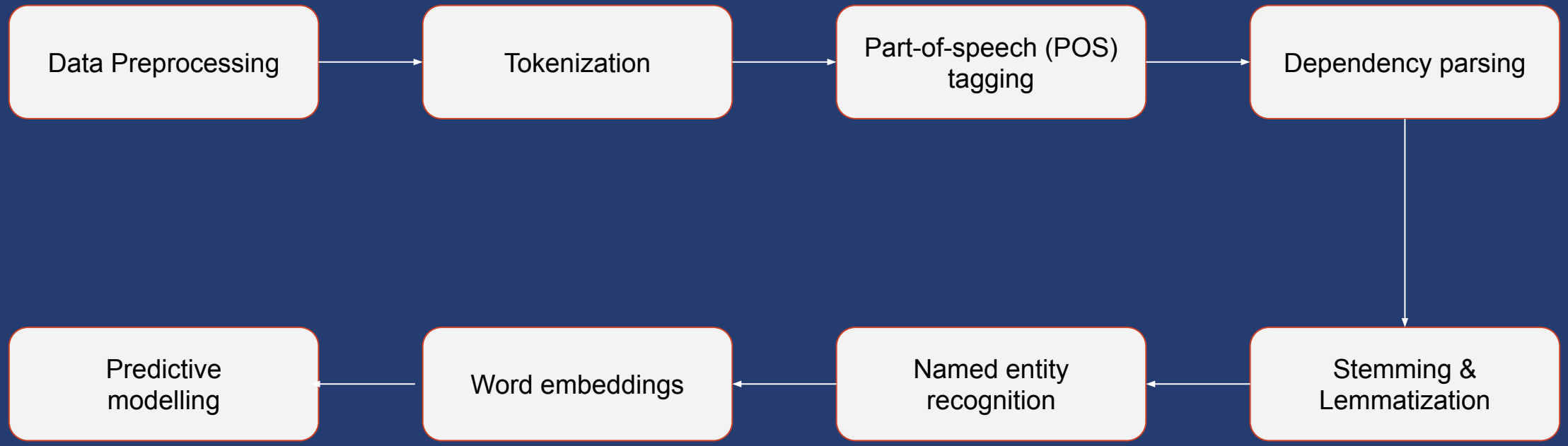


Use cases of NLP

Chat bots, Translation, Sentiment analysis…

Famous uses of NLP

Typical NLP pipeline



Data Pre-processing

Normalization and noise removal

1. Remove HTML tags **(

)**
2. Remove extra whitespaces
3. Convert accented characters **(Café → Cafe)**
4. Expand contractions **(I'm → I am)**
5. Remove special characters
6. Convert upper to lowercase
7. Convert alphabetical numbers to numeric form **(three → 3)**
8. Remove stopwords **("am, is, are, was, were")**

Tokenization

By their ASCII character codes?

01 | LISTEN

02 | SILENT

Difficult for machines to understand words just by their letters

Tokenization

Encoding sentences by their words instead?

01 | **I love my dog**

02 | **I love my cat**

Easier for computers to figure out similarities/differences

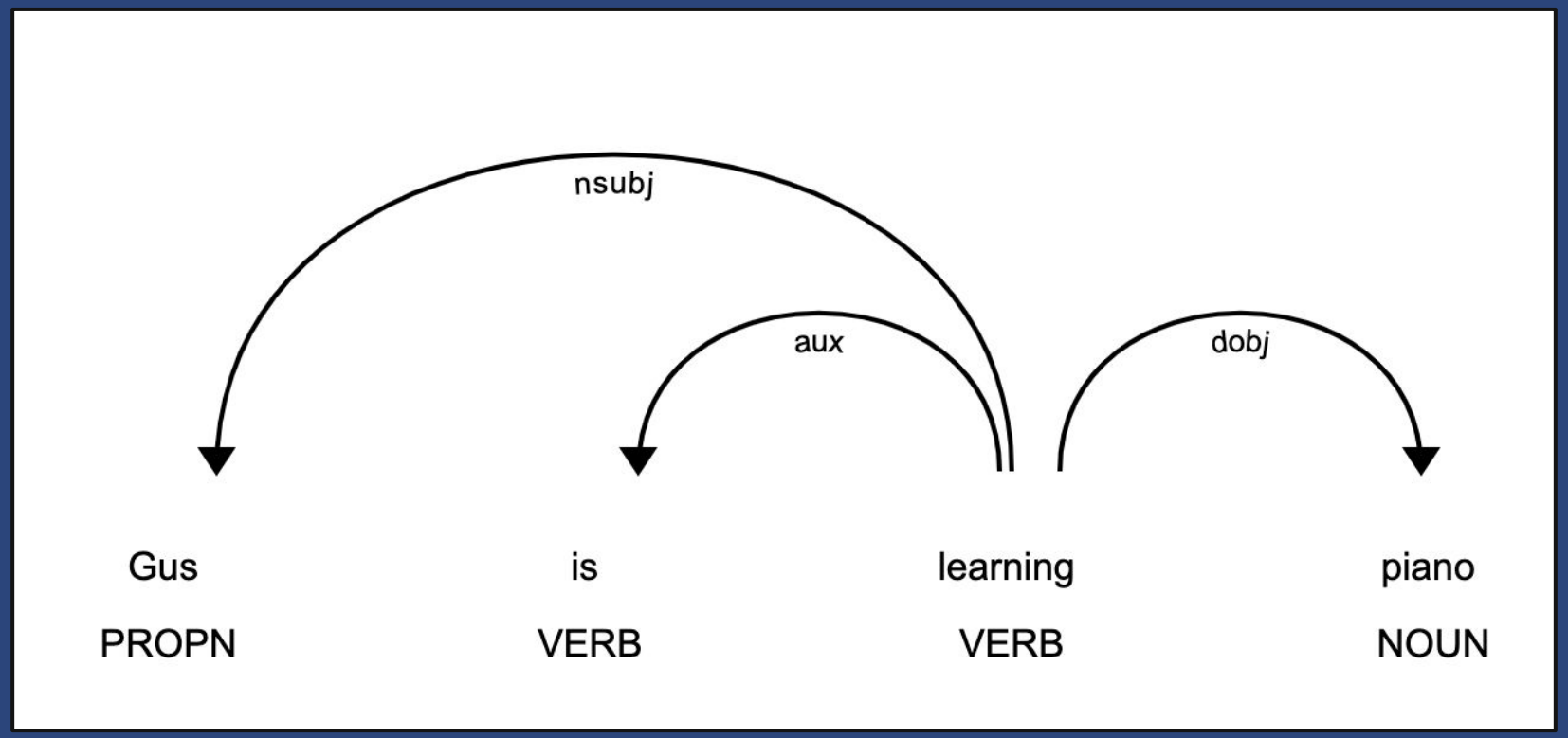
Part-of-speech (POS) tagging

Both definition and context matters

With POS tagging, computers can better understand relevant context

Dependency parsing

Determining grammatical rules



Analyzing the grammatical structure in a sentence and determining related words + the relationship between them

Stemming

Reducing words to their root form

01 **Flying -> Fly**

How to stem these words?

- University
- Universe

<u>Result:</u> "Univers"
OverStemming!

02 **Waits -> Wait**

How to stem these words?

- Data
- Datum

<u>Result:</u> "Data, Datu"
UnderStemming!

Lemmatization

Reducing words to their root form (with context)

01 **Considers context**

02 **A word can have multiple lemmas**

```
Examples of lemmatization:

-> rocks : rock
-> corpora : corpus
-> better : good
```

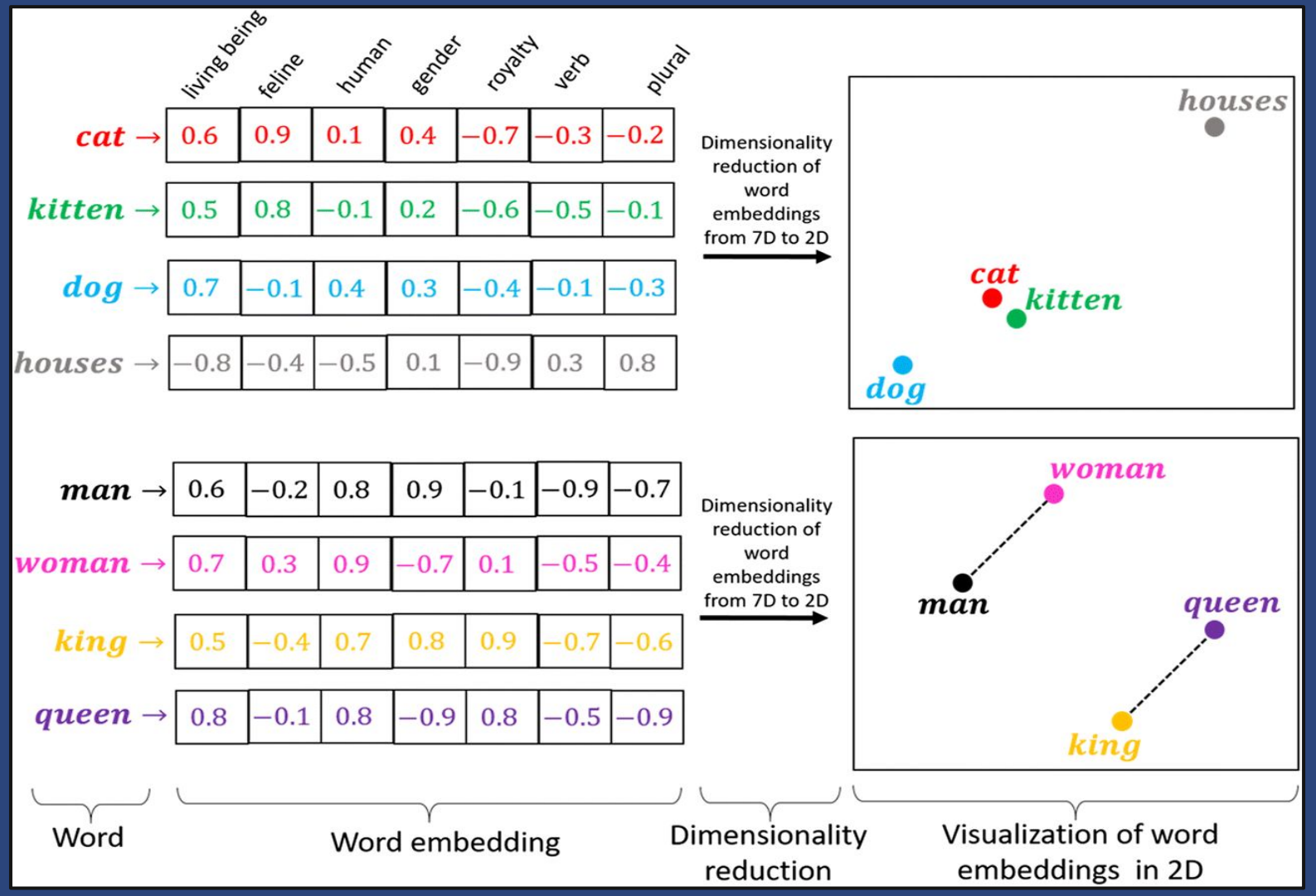
Named Entity Recognition (NER)

Identifying “real-world” objects

Parse through the text and label “real-world” objects such as location, people or products

Word embeddings

How do machines read words?

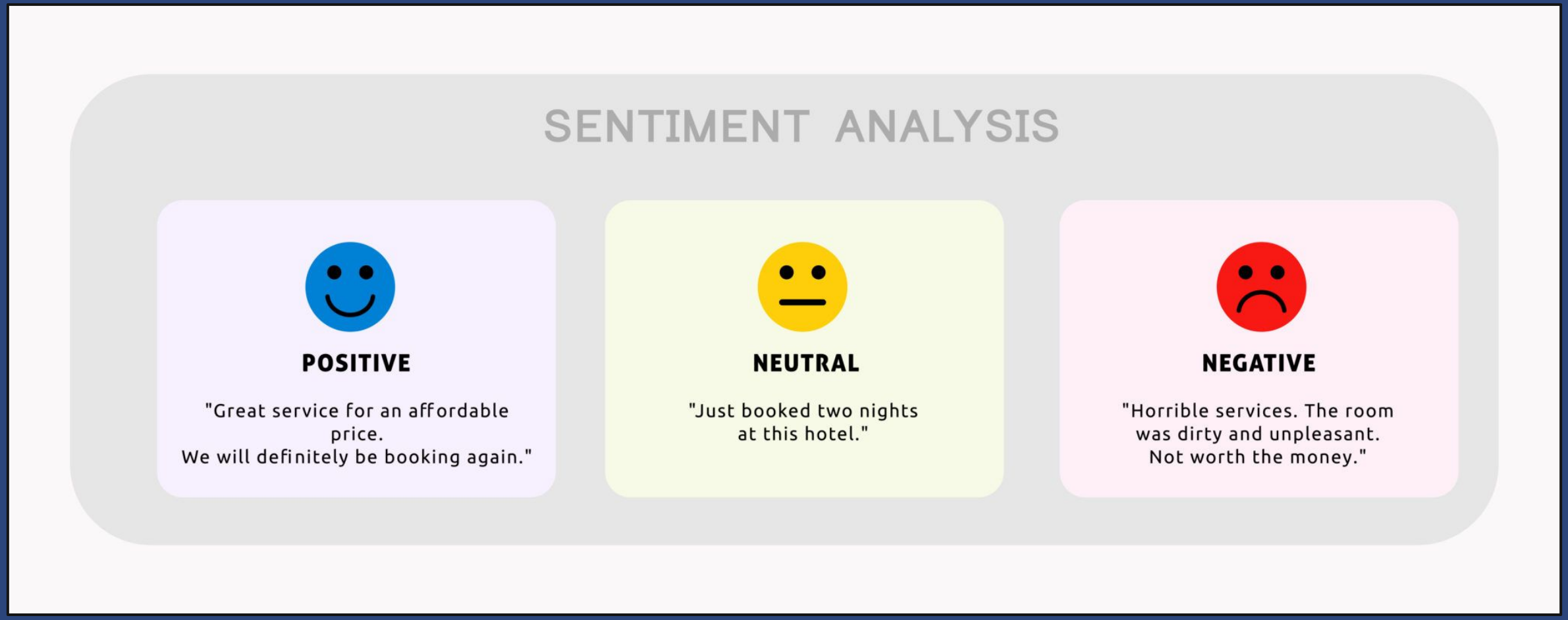


Examples:

- *Latent Dirichlet Allocation (LDA)*
- *Word2Vec*
- *GloVe*
- *BERT*
- *And many more..*

Predictive modelling

What can we do with machine learning?



Go through thousands of reviews and determine whether they are positive, neutral or negative by running the algorithm just once

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Thank You

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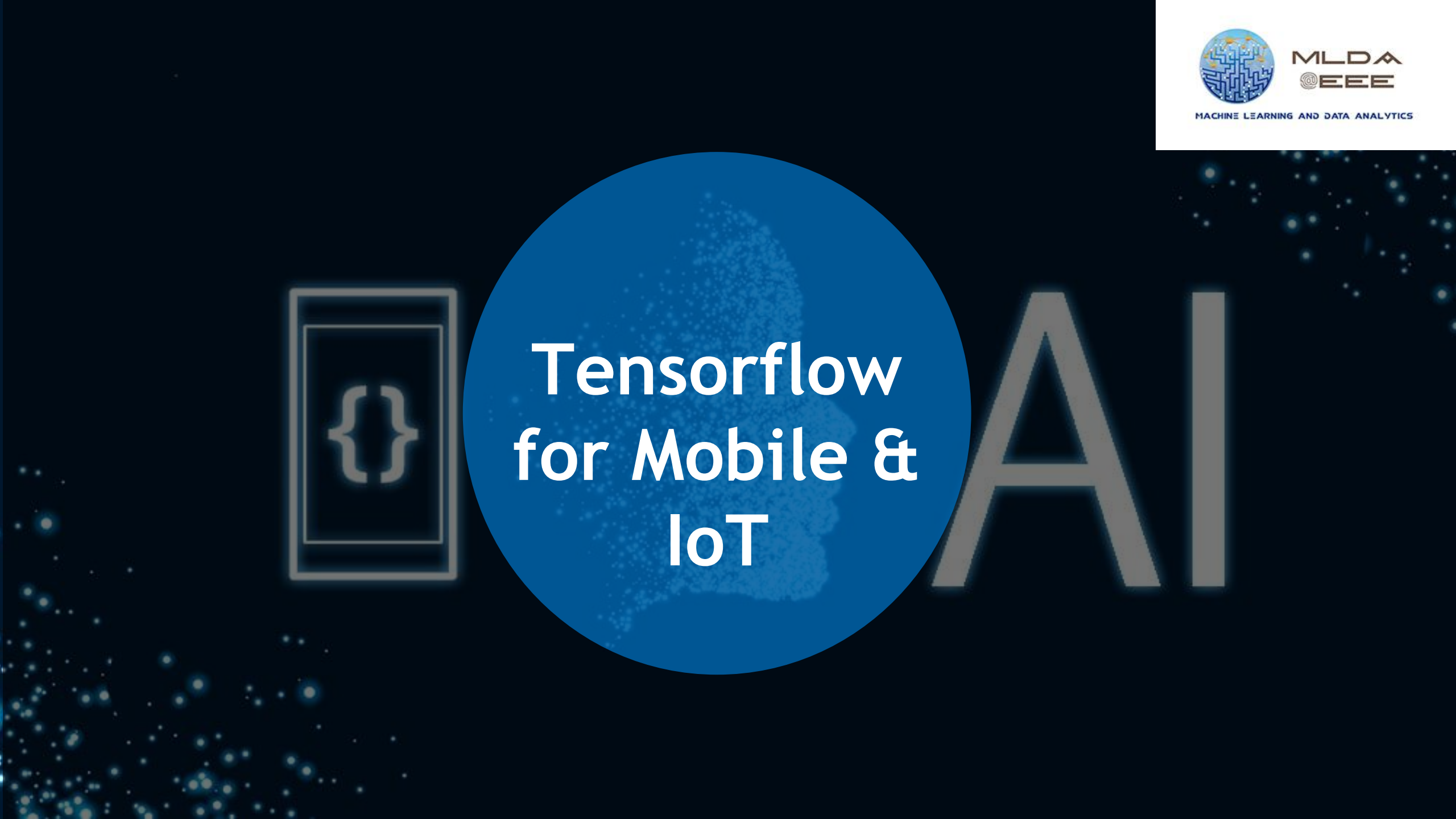
https://tinyurl.com/nlp-fb-form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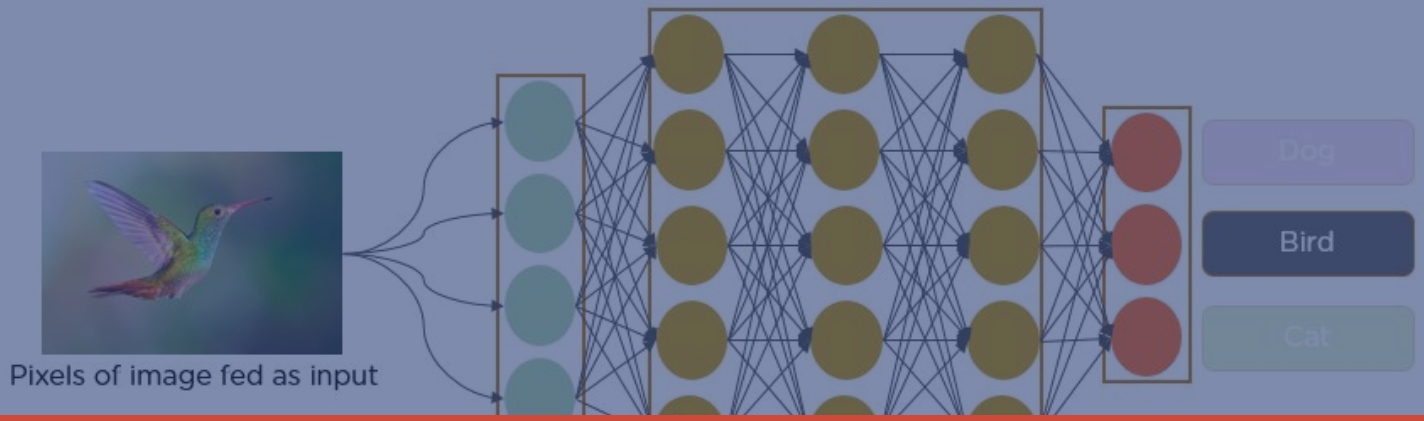
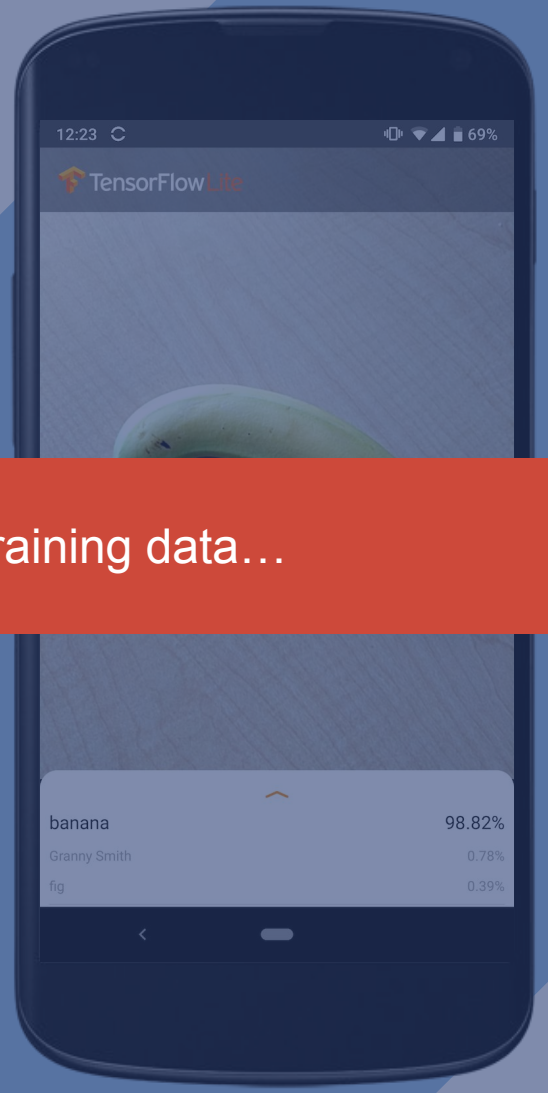
Tensorflow for Mobile & IoT
AI

Machine Learning for image classification





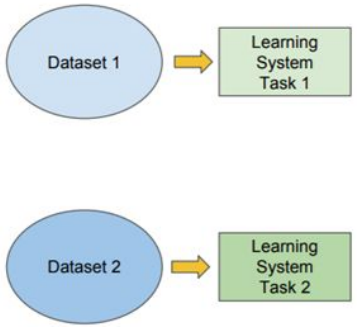
Machine Learning Model lacks accuracy due insufficient training data…

1. Collection of door images data
2. Building a Convolutional Neural Network Model
3. Training and Testing the model

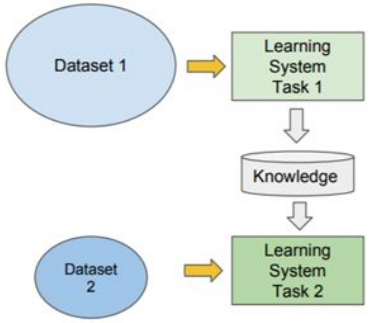
Transfer Learning

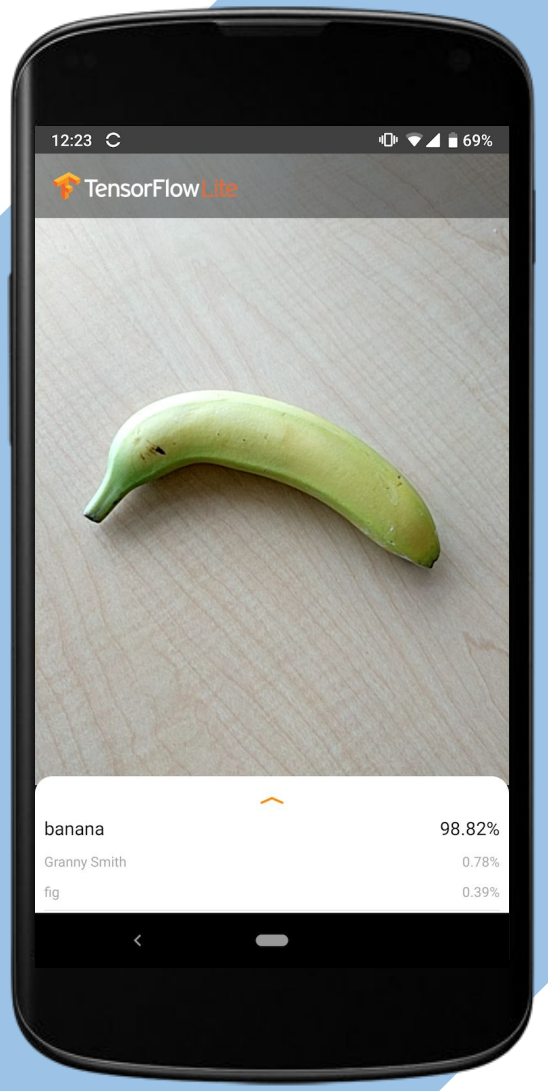
Traditional ML vs Transfer Learning

- Isolated, single task learning:
  - Knowledge is not retained or accumulated. Learning is performed w.o. considering past learned knowledge in other tasks



- Learning of a new tasks relies on the previous learned tasks:
  - Learning process can be faster, more accurate and/or need less training data





1. Using existing Google machine learning models
2. Making slight changes and tweaks to them
3. Feeding of images data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