

IT TRAINING

Machine Learning

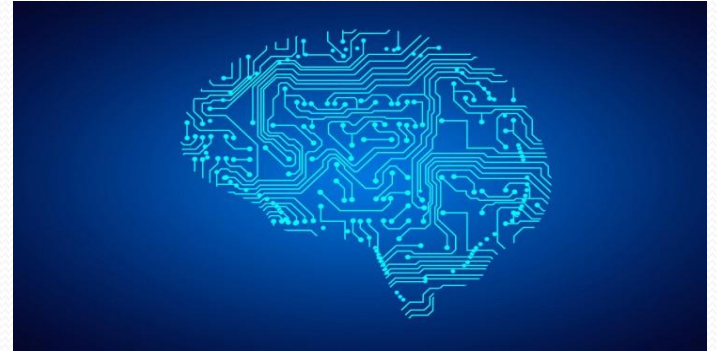
PRESENTED BY:

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ML - Machine Learning

“Machines imitating and adapting human like behavior”

- For ex: Take a look at this Quiz
 - 3 - 9
 - 4 - 16
 - 8 - 64
 - 9 - ??
- So we are trying to teach machines to *“Learn from Experience”*
- ML Algorithms → computational methods → *“learn”* → directly from data → without relying → predetermined equation → model
- ML Algorithms → improve performance → no. of samples → learning increases
- ML Algorithms → natural patterns → data → insights → predict the unknown → better decisions



SIMPLE Ex of ML:

Dino-Jump:

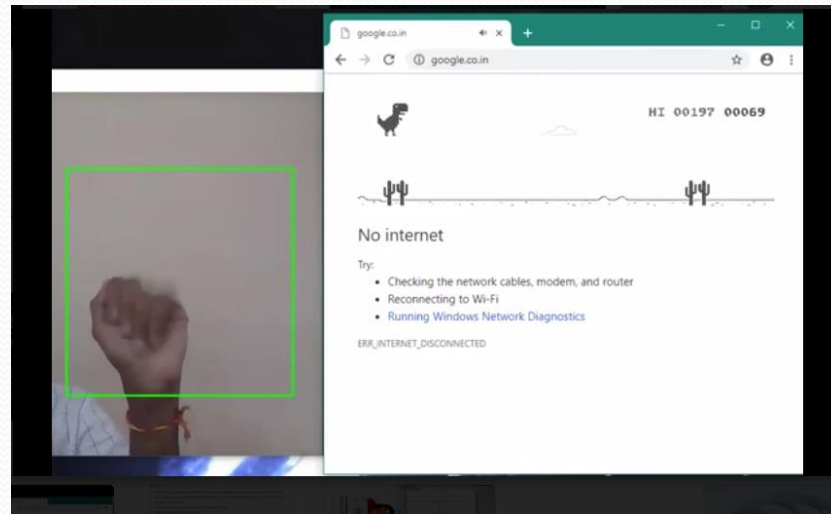
A ML application to play Chrome T-rex game using hand gestures.

Technologies: ML, OpenCV, Deep Neural Networks, Keras (Python)

Please click the below link:

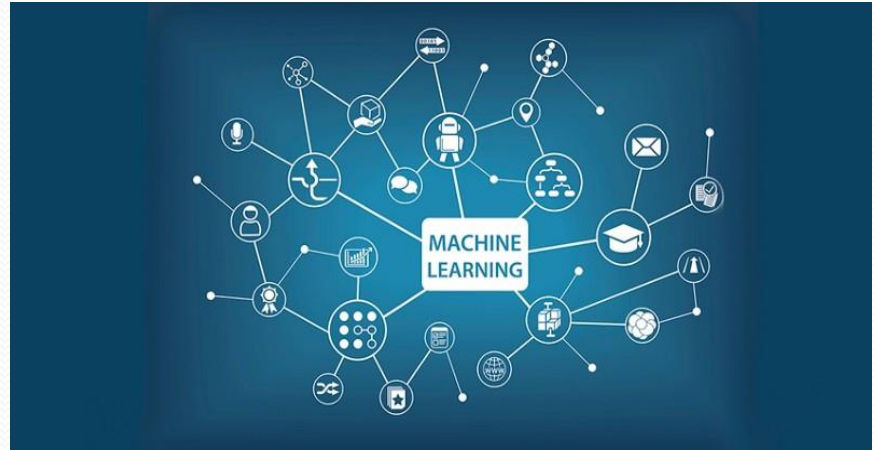
<https://drive.google.com/open?id=1vxJ4tbma-PhW61hdiWZ3CRI37o5gkzCD>

Screenshot →



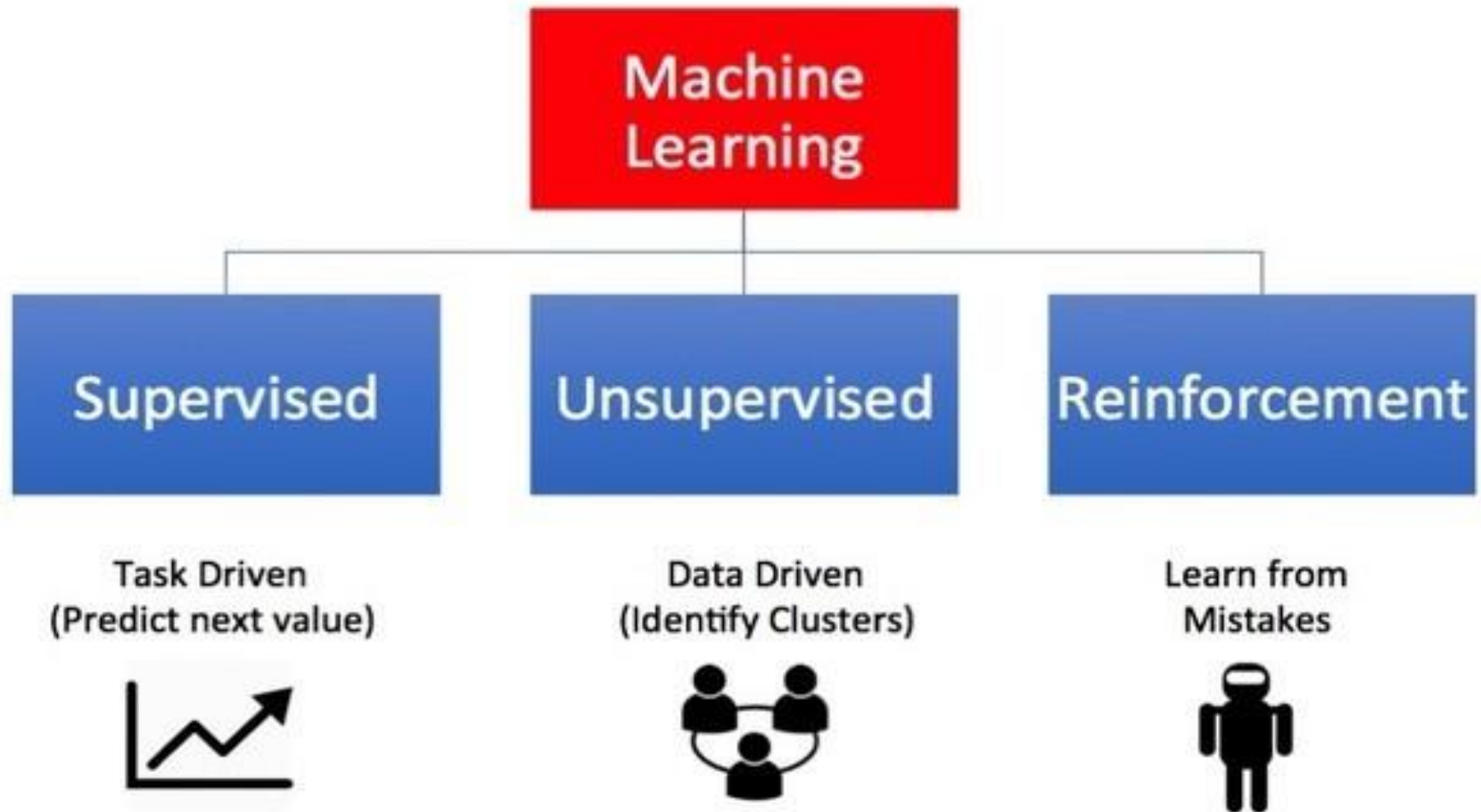
Why ML?

- Growing Data
- 80% of data is unstructured
 - Audio, Videos, Photos
 - Documents, Graphs
- Finding patterns in data on planet Earth (massive & time consuming)
- ML comes to the “human rescue”
- Machine Learning is a subset (sub-field) of Artificial Intelligence
- Applying AI → intelligent machines
- New capability for computers → developed inside of ML



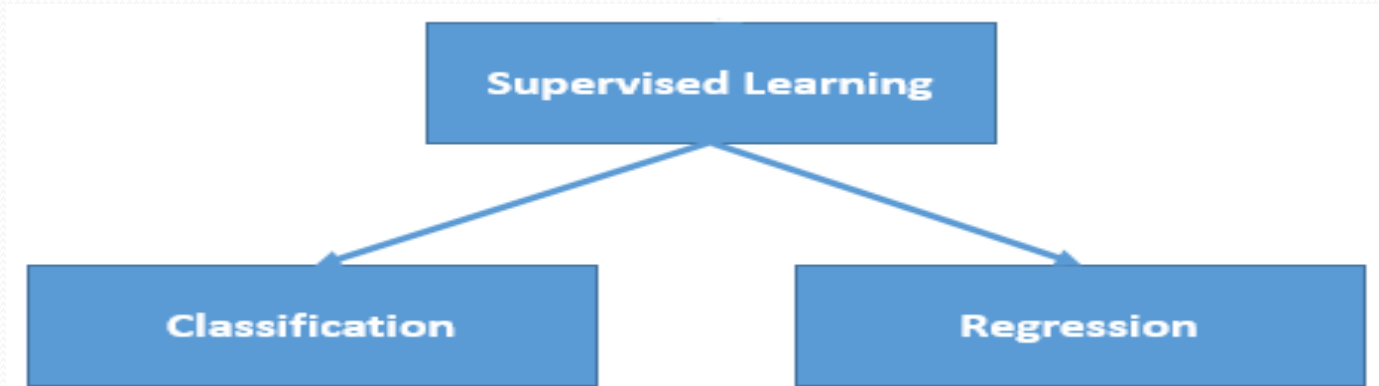
ML Types

Types of Machine Learning



Types of ML - I

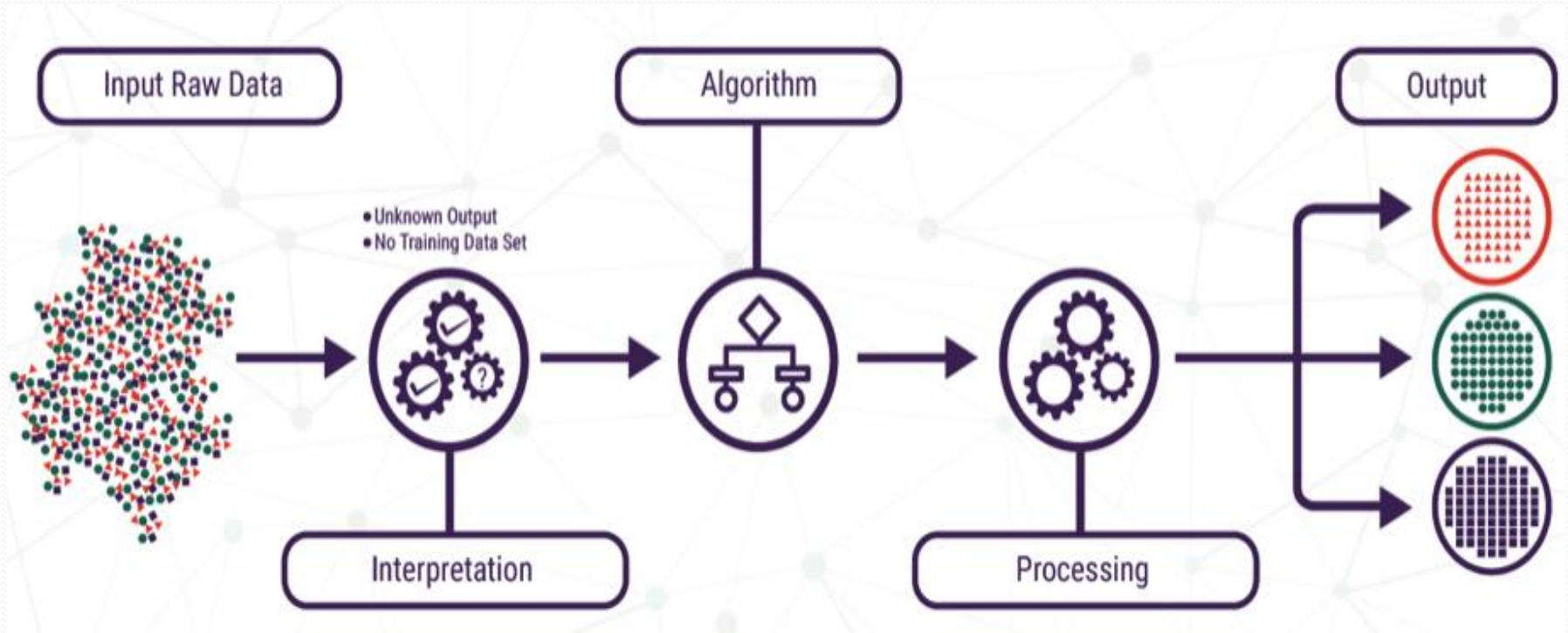
“Finding patterns (predictive model) using both, input data and output data.”



- **Classification:** Used for predicting discrete responses.
 - **For ex:** *Whether Canada will WIN or LOSE a soccer match? Whether an email is SPAM or GENUINE?*
 - WIN, LOSE, SPAM, GENUINE → predefined & output has to fall among these depending on the input.
- **Regression:** Used for predicting continuous responses.
 - **For ex:** Trend in stock market prices, Weather forecast, etc.

Types of ML - II

“Finding patterns based ONLY on input data”



For ex: Let's assume a group (A-Z) with Data Item (d_1) in one group (A) is very much similar to other data items (d_2-d_x) in the same group (A), but (d_1) is significantly different from data items belonging to different groups (B-Z).

Common Applications

- Your personal Assistant Siri or Google or Alexa or Bixby
- Weather predictions for the next week
- Win Predictor in a sports tournament
- Medical Diagnosis
- Media sites showing recommendations and ads matching closely to your interests. How do you think that's possible?
- Medical Research... Is this cancer?
- What is the market value of this house?
- Which of these people are good friends with each other?
- Will this rocket engine explode on take-off?
- Will the movie be liked by public?

Tools used in ML

- Python, C++, MATLAB
- TensorFlow (*OpenSource tool library for dataflow programming*)
- NumPy (*Python programming library*)
- NLTK, matplotlib, SciPy (*Scientific Python*)
- Apache Kafka, Spark
- MxNet (*Apache based open-source deep learning framework*)
- R programming
- Java, Scala (*OOP language built on JVM - Java Virtual Machine*)
- Tableau (*Next version/ extension to MS Excel*)
- Clojure (*LISP language - LISt Processing program's language*), JavaScript
- Go (*Google Language*), PostgreSQL
- PyTorch (*open source machine learning library for Python*)
- Caffe/ Caffe2 (*deep learning framework written in C++ & Python*)

Sample ML Job

Basic qualifications

- Bachelor's degree or higher in an analytical area such as Machine learning, Computer Science, Physics, Mathematics, Statistics, Engineering or similar
- 4+ years professional experience in Analytics or other quantitative disciplines.
- Experience with modeling and analysis including machine learning, statistical analysis, operations research and management science and data mining
- Must be able to explain technical concepts and analyses implications clearly to a wide audience, and be able to translate business objectives into actionable analyses
- Experience with SQL (any variations thereof), Python/ PySpark and/or Scala preferred; though experience with other analytics software (SAS, STATA, MATLAB, Mathematica, R/SparklyR) is acceptable
- Familiarity with AWS solutions such as Glue, S3, and Redshift
- Proven analytical and quantitative skills to use hard data and metrics to back up assumptions, develop business cases, and complete root cause analyses
- Creative in finding new solutions/ designing innovative methods, systems, and processes