Machine Learning

SUPERVISED LEARNING IN DATA ANALYSIS

Robotic Lab
Hochschule Rehin-Waal issued 11/11/19

Fields

Computer Vision

- How can computers understand digital images and video?
- Example: Facial recognition, object detection, object recognition, image generating, etc.

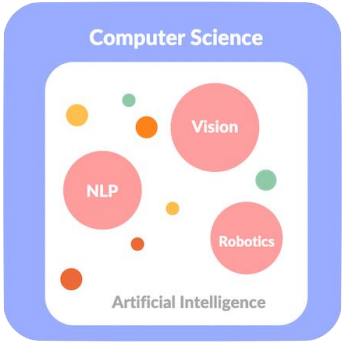
Natural Language Processing

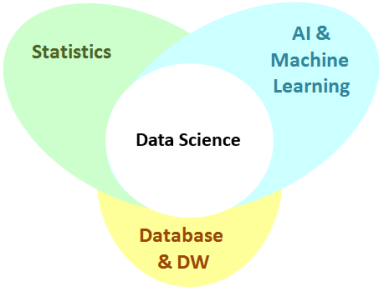
- How can computer understand natural language data?
- Example: Virtual assistant, speed recognition, speed-to-text, etc.

Data Analysis

- How can computer understand and deliver prediction from raw data?
- Example: House price prediction,

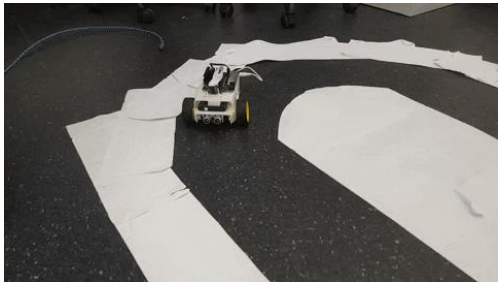
Manufacturing / Medical / Logistic / Robotics, etc

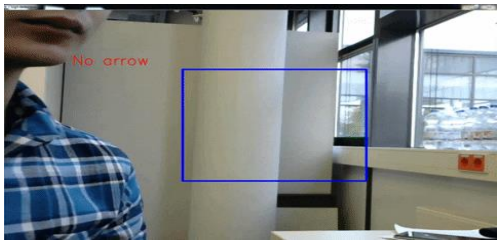




AI in Robotic Lab

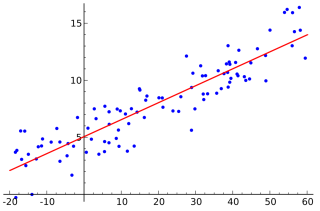
- Object detection and recognition
- Self-driving rover.
- Traffic-sign recognition.

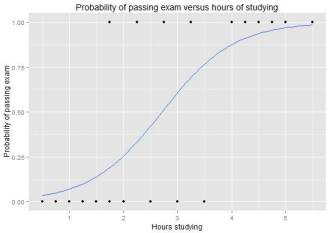


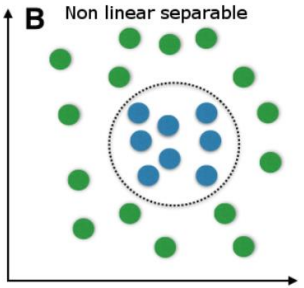


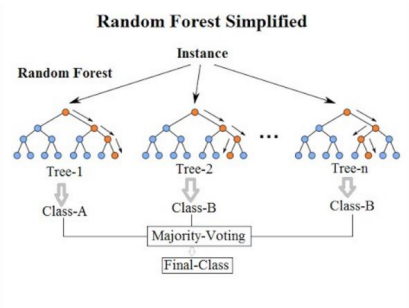
Supervised learning algorithms

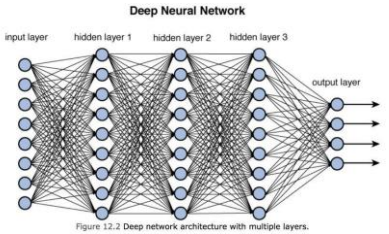
- Linear Regression
- Logistic Regression
- Support Vector Machines (SVMs)
- Decision Trees and Random Forrest
- Neural Networks





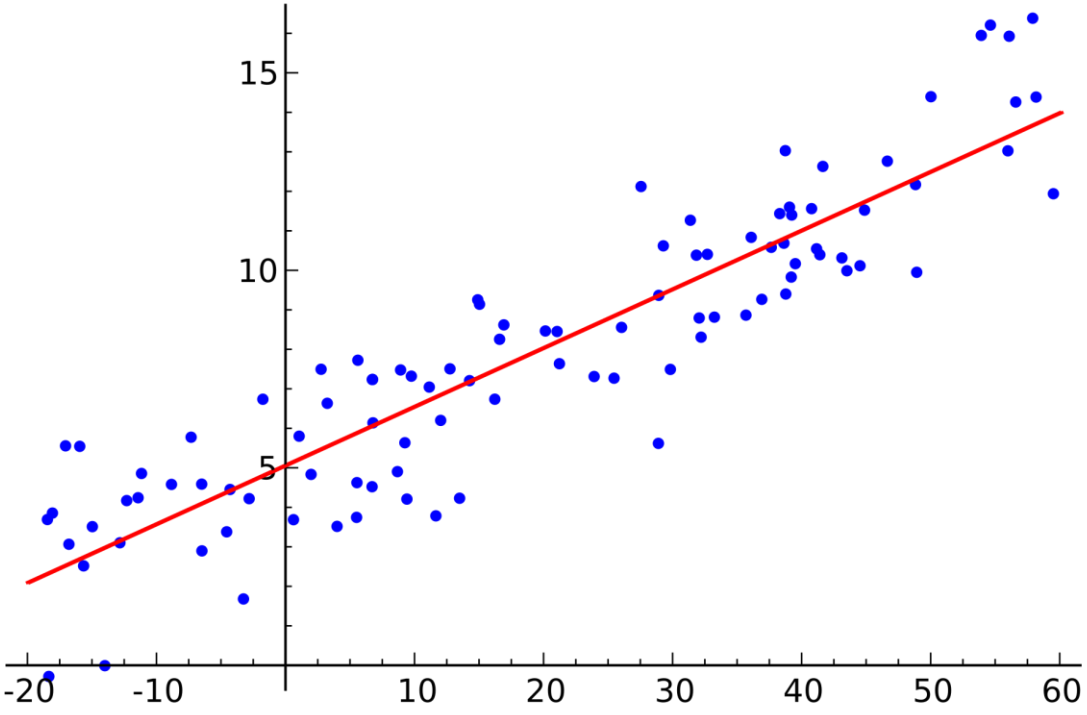




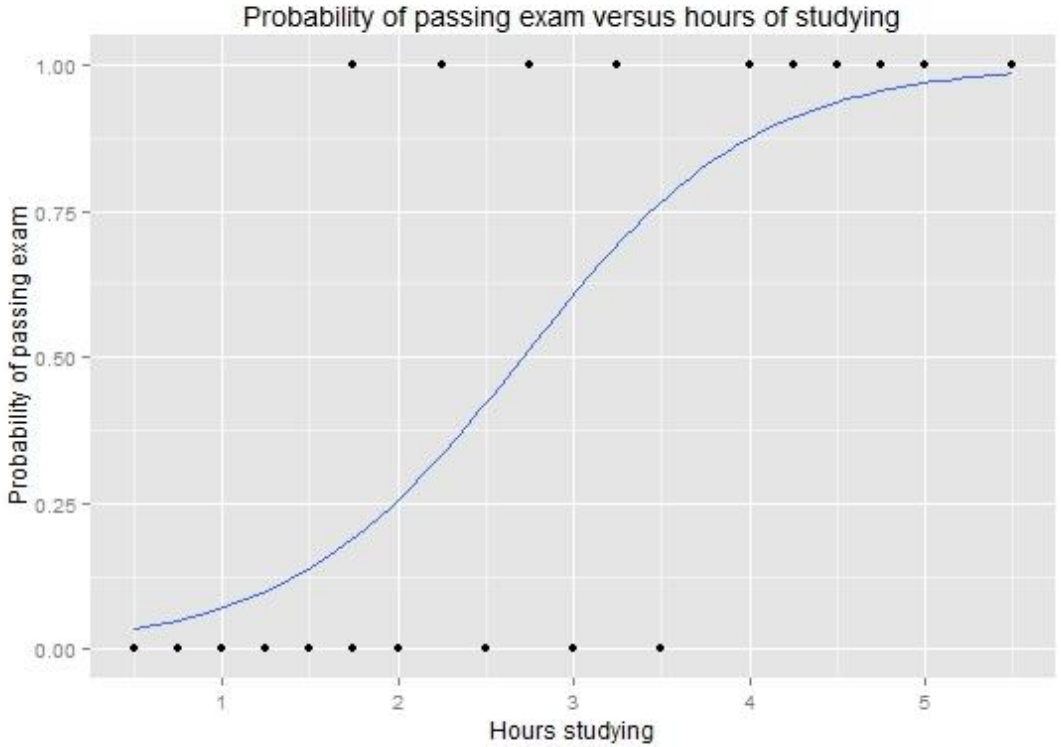


Approach to ML problem

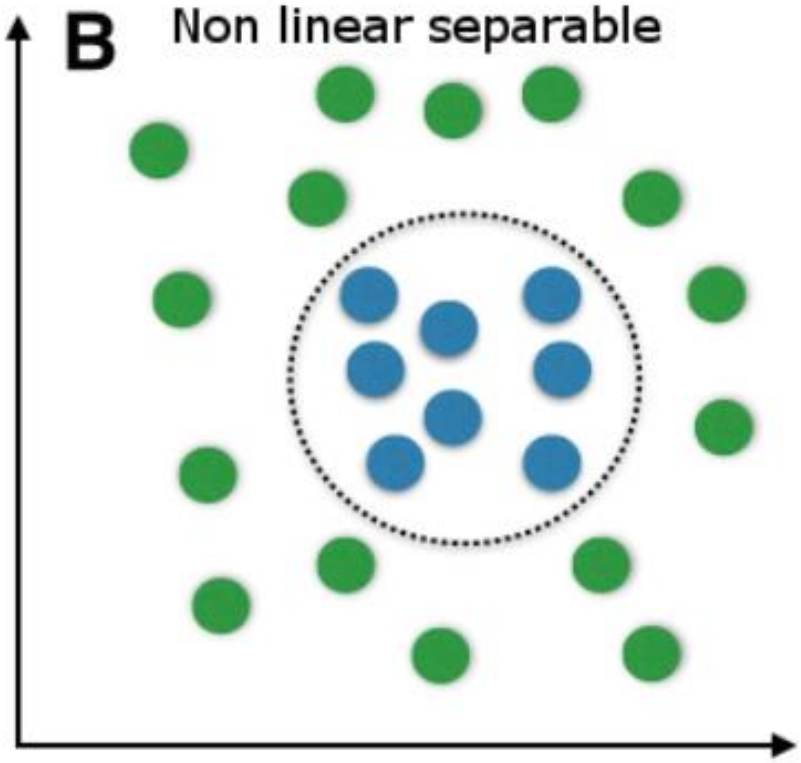
1. Visualize and pre-process your dataset.
2. Select machine learning algorithm.
3. Create a model and train it.
4. Fine-tune your model.
5. Evaluate and test your model.



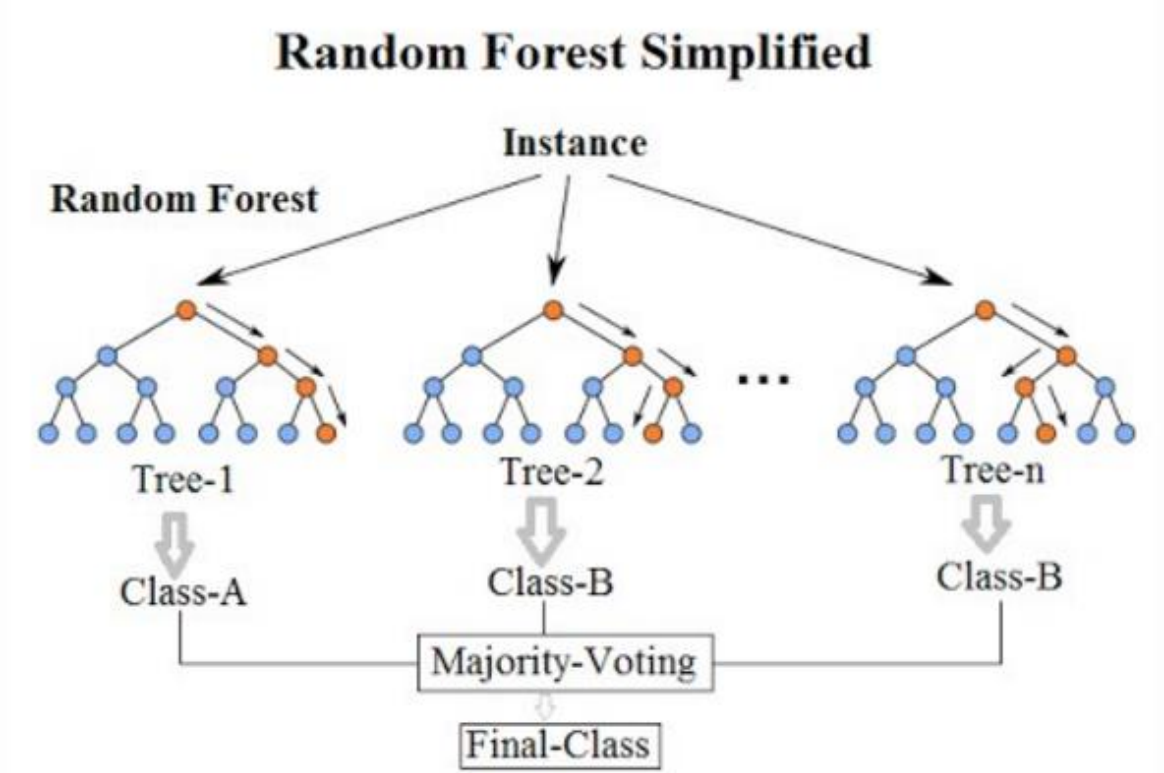
Linear Regression



Logistic Regression



Support Vector Machines (SVMs)



Random Forrest

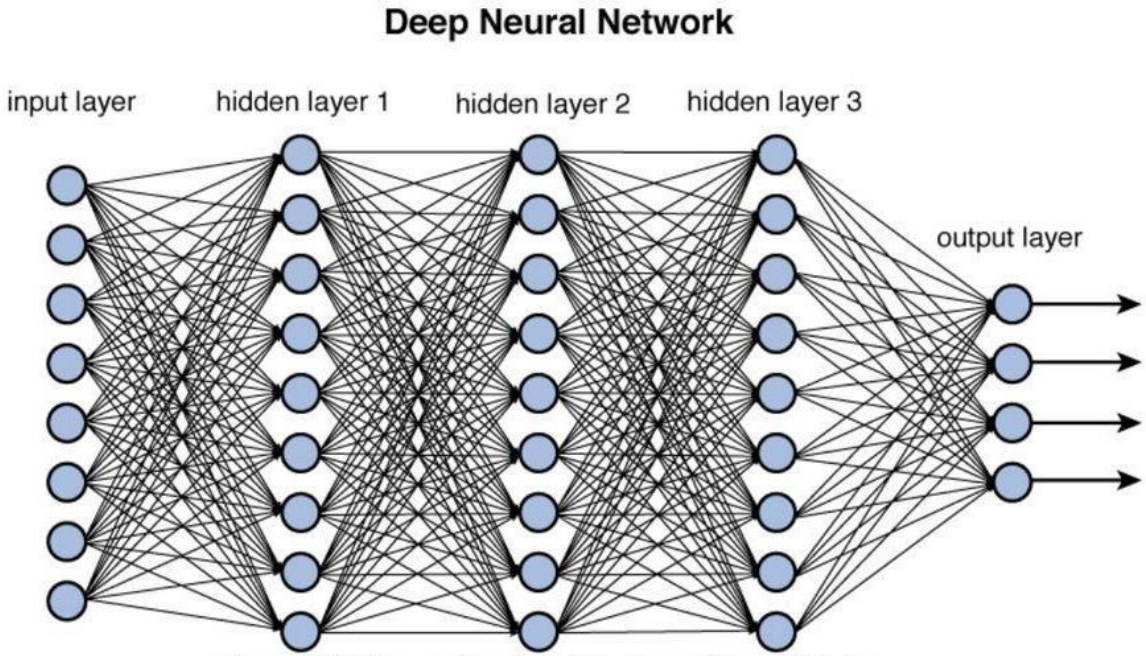


Figure 12.2 Deep network architecture with multiple layers.