Date . . . No.

Name: Pham Dang Quang
ID: 20182743

(1)

*Definition of ML:

- According to Tom Mitchell, ML is the study of algorithms that improve their performance P, at some task T with experience E.

* 3 examples of ML:

* Playing checkers:
  - T: Playing checkers
  - P: Percentage of games won against an arbitrary opponent
  - E: Playing practice games against itself.

* Hand-written words recognition
  - T: Recognizing hand-written words
  - P: Percentage of words correctly classified
  - E: Database of human-labelled images of handwritten words

* Categorize email messages
  - T: Categorize emails as spam or legitimate
  - P: Percentage of email messages correctly classified
  - E: Database of emails, some with ~~human~~ human-given labels.

HẢI TIẾN

Date . . . No.

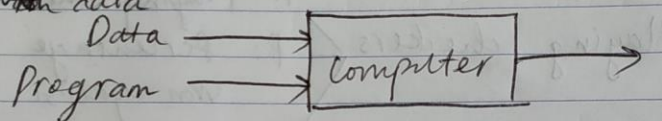
(2).

* ~~Similarity~~ Similarities:

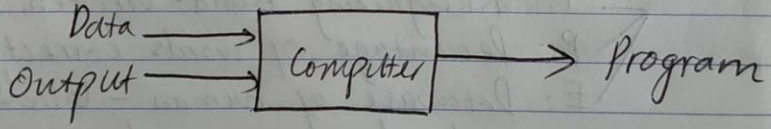
- Both have Data as an input to Computer

* Differences:

- Traditional programming is a manual process, ~~which~~ which means a person creates the program and manually formulate the rules with data



- Machine Learning has the algorithm that automatically formulate the rules or codes from data and output then gives logic.
→ automatic process



(3). Use ML instead of traditional programming

- ① Email spam recognition.

- With traditional programming, we can have some rules such as: Title contains "Sale", "Deals" or "Hot discount",.... or in the body of the email, we can have some specific

HẢI TIẾN

Date . . . No.

keywords.
- Provided that ones find out their email has been blocked, they will change their email title or keywords
⇒ we have to find them and add them to our rules ⇒ complex ⇒ hard to maintain

→ Use ML is better with shorter codes, easier to maintain, self-update ~~logic~~ its logic and more precisely.

5,
- Supervised learning: training in the dataset with labeled images ← classification: discrete output
regression: continuous output
- Unsupervised learning: training in the dataset without labeling input data
- Semi-supervised learning: training data with a few labeled images.
- Reinforcement learning: given a sequence of states and actions with (delayed) rewards, output a policy

HẢI TIẾN

6,

* steps to design a learning system.

- Choose the training experience
- Choose exactly what is to be learned
- Choose how to represent the target function
- Choose a learning algorithm to infer the target function from the experience.

* Basic - algorithms:

- Linear Regression: it is used to estimate value (cost of houses, number of calls, total sales, etc...) based on continuous variables

- Decision Tree: It is mostly used for classification problems. It works for both categorical and continuous dependent variables

- Support Vector Machine: It is a classification method - In this algorithm, we plot each data item as a point in n - dimensional space (where n is number of features) with the value of each feature being the value of a particular coordinate.

Date . . . No.

4,

- 3 ~~appl.~~ typical applications of ML:
  - ~~M~~Medical Images Diagnosis
  - Google Email filter
  - Apple · Assistant "Siri"

TIẾN