MACHINE LEARNING-INTRODUCTION

B.Sc. 5th Sem (Paper Code: DSE2)
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SYLLABUS

- ***Discipline Specific Elective (DSE)***

- **DSE2T: Machine Learning** **Credits 04**

  Introduction:

- Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning: Bayesian Method, The Naive Bayes Classifier.

- **Software for Machine Learning and Linear Algebra Overview:**

  Plotting of Data, Vectorization, Matrices and Vectors: Addition, Multiplication, Transpose and Inverse using available tool such as MATLAB.

SYLLABUS

- ***Discipline Specific Elective (DSE)***

- **DSE2T: Machine Learning Credits 04**
- **Linear Regression:** Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling/Selection.
- **Logistic Regression:** Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.
- Regularization and its utility: The problem of Over fitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance.
- **Neural Networks:** Introduction, Model Representation, Gradient Descent vs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Backpropagation Algorithm.

SUGGESTED BOOKS

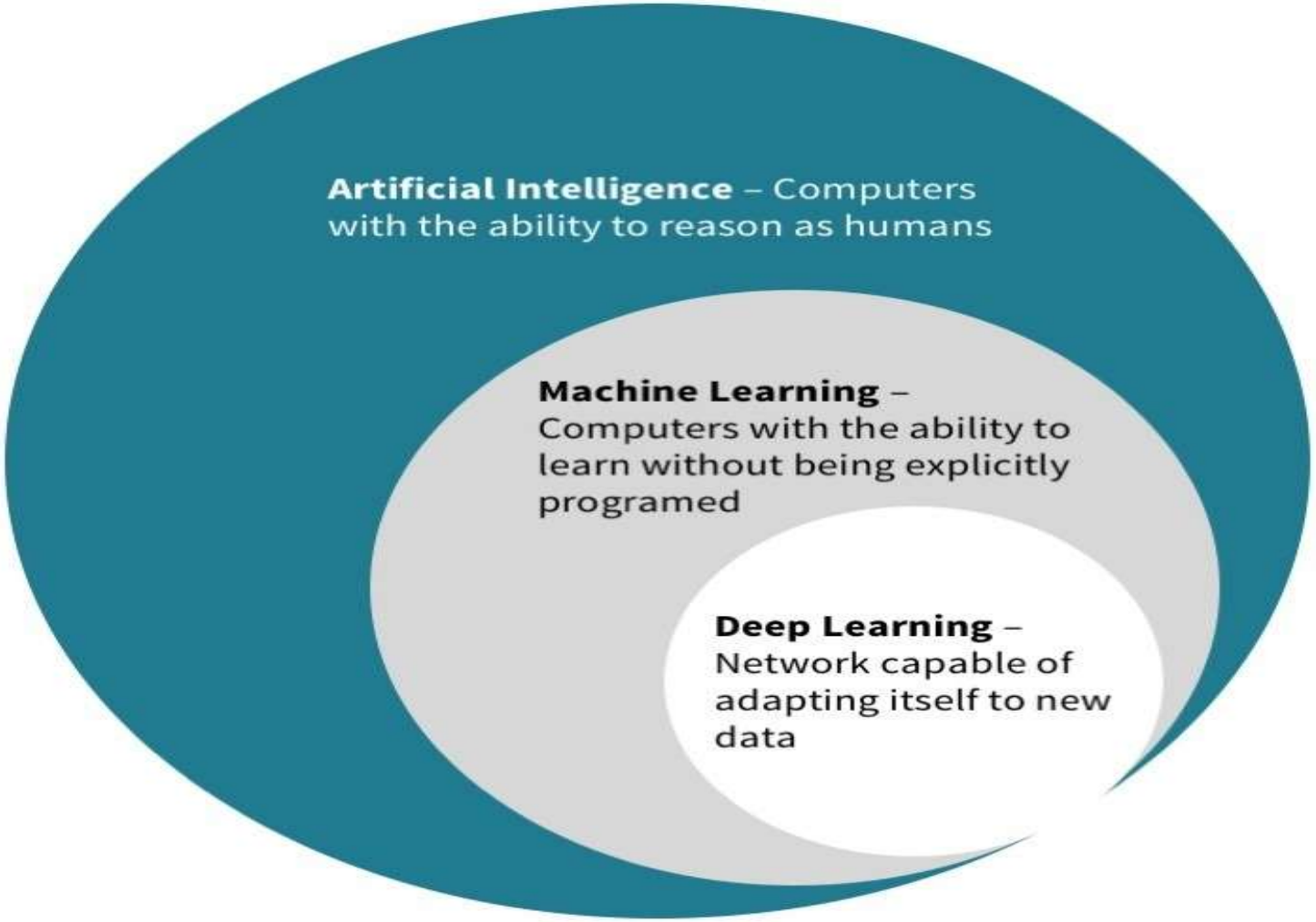
1. Ethem Alpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT Press, 2009.

2. Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill Education, 2013.

3. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007.

4. Mevin P. Murphy, "Machine Learning: A Probabilistic Perspective" by The MIT Press, 2012.

BACKGROUND


Artificial Intelligence – Computers with the ability to reason as humans
Machine Learning – Computers with the ability to learn without being explicitly programed
Deep Learning – Network capable of adapting itself to new data

SOME EXAMPLES…


12:23
Search
New
Amanda Willis (2 mutual friends) added 1 photo that might include you. Go to Photo Review to see it.
13 minutes ago
Gary Chavez added 1 photo that might include you. Go to Photo Review to see it.
22 minutes ago
Kevin Burton added 1 photo that might include you. Go to Photo Review to see it.
27 minutes ago

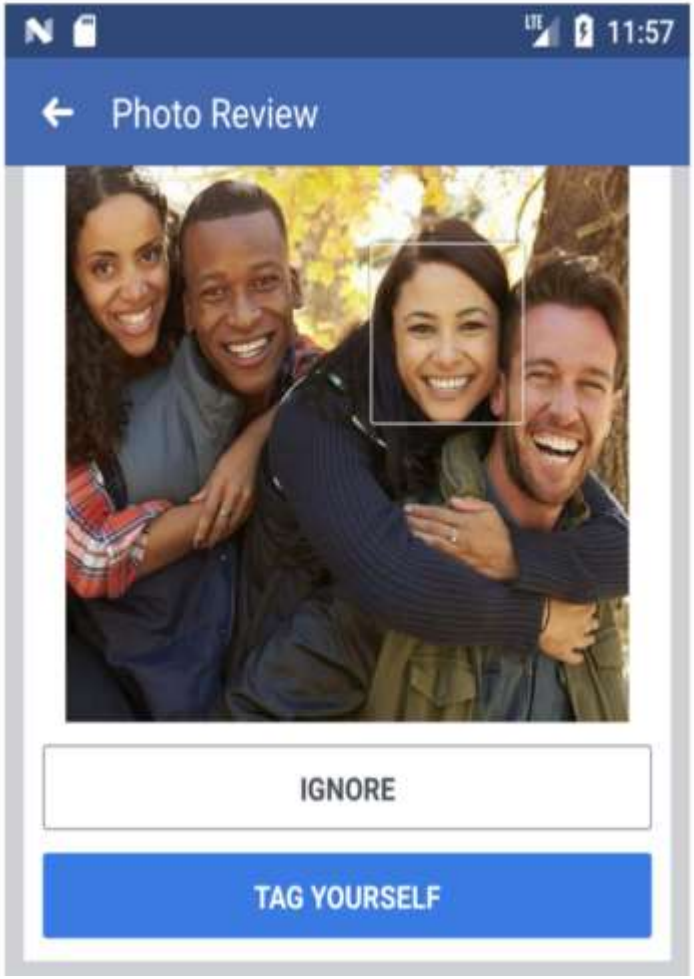

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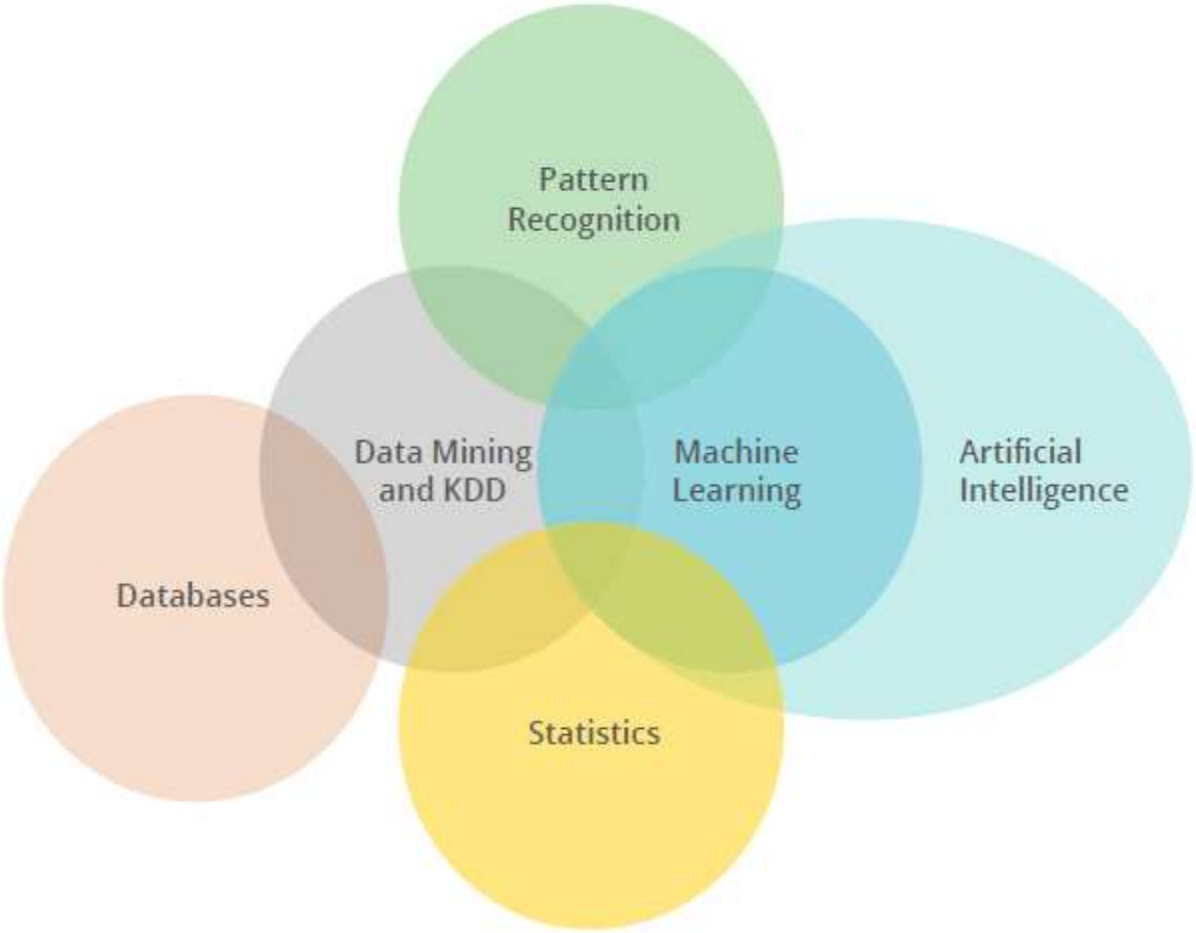
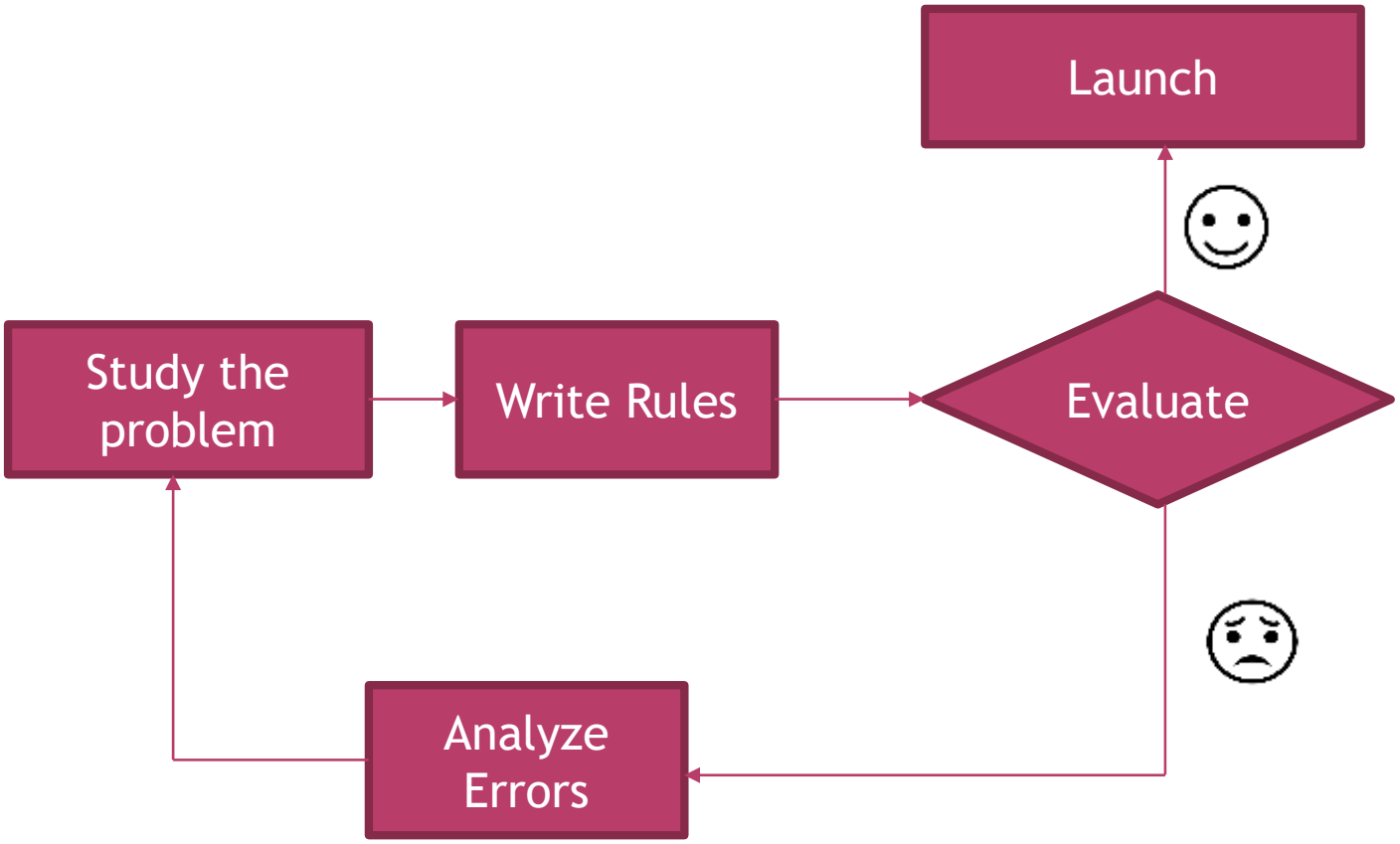
Photo Review
IGNORE
TAG YOURSELF

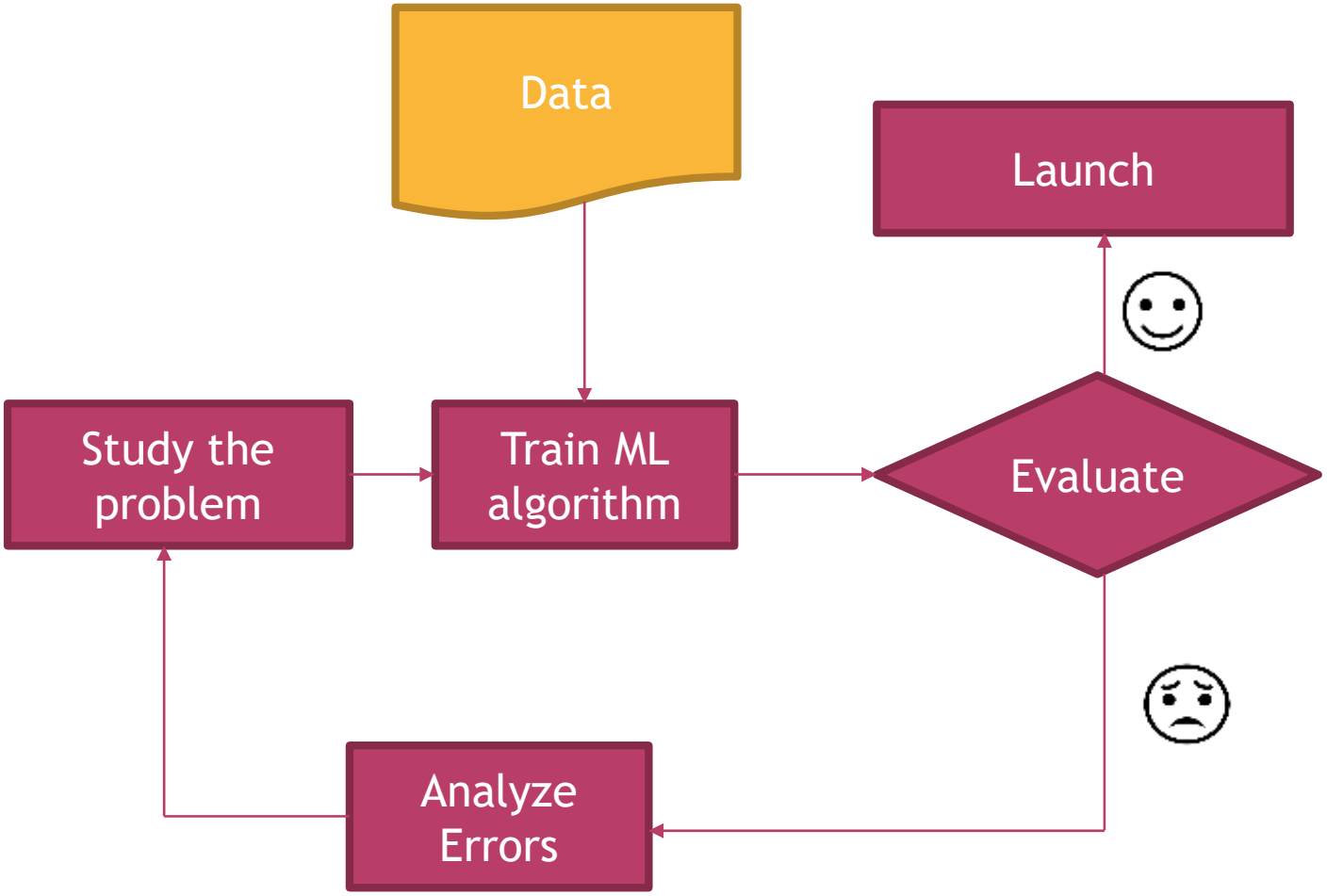
A CONGLOMERATE OF MULTIPLE DISCIPLINES



WORKFLOW WITHOUT ML



WORKFLOW WITH ML



WHAT IS MACHINE LEARNING?

- **Arthur Samuel**, a pioneer in the field of artificial intelligence and computer gaming, coined the term **"Machine Learning"**. He defined machine learning as – **"Field of study that gives computers the capability to learn without being explicitly programmed"**.

BASIC DIFFERENCE IN MACHINE LEARNING & TRADITIONAL PROGRAMMING

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- **Traditional Programming :** We feed in DATA (Input) + PROGRAM (logic), run it on machine and get output.
- **Machine Learning :** We feed in DATA(Input) + Output, run it on machine during training and the machine creates its own program(logic), which can be evaluated while testing