Introduction To Machine Learning - IITKGP

By Prof. Sudeshna Sarkar | IIT Kharagpur

Learners enrolled: 19897

Introduction

This course provides a concise introduction to the fundamental concepts in machine learning and popular machine learning algorithms. We wil cover the standard and most popular supervised learning algorithms including linear regression, logistic regression, decision trees, k-neares neighbour, an introduction to Bayesian learning and the naïve Bayes algorithm, support vector machines and kernels and neural networks witt an introduction to Deep Learning. We will also cover the basic clustering algorithms. Feature reduction methods will also be discussed. We wil introduce the basics of computational learning theory. In the course we will discuss various issues related to the application of machine learning algorithms. We will discuss hypothesis space, overfitting, bias and variance, tradeoffs between representational power and learnability evaluation strategies and cross-validation. The course will be accompanied by hands-on problem solving with programming in P anc some tutorial sessions.

TENDED AUDIENCE : UG, PG, BE, ME, MS, M.Sc, PhD

RE-REQUISITES : Basi (https://swayam.gov.in/) basic of (https://swayam.gov.in/os_details/NPTEL)

IDUSTRY SUPPORT : Data science companies and many other industries value machine learning skills.

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Summary

ourse Status :	Completed
ourse Type :	Elective
uration :	8 weeks
ategory :	∘ Computer Science and Engineering ∘ Artificial Intelligence ∘ Data Science ∘ Programming ∘ Robotics
redit Points :	2
evel :	Undergraduate/Postgraduate
tart Date :	25 Jul 2022
nd Date :	16 Sep 2022
nrollment Ends :	08 Aug 2022
xam Date :	25 Sep 2022 IST

ote: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

This is an AICTE approved FDP course

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(AUTONOMOUS)
Shaikpet, Hyderabad - 500 104

Course layout

(https://swayam.gov.in/) (https://swayam.gov.in/nc_details/NPTEL)

Week 1: Introduction: Basic Definitions, Inductive learning, Inductive bias, evaluation, cross-validation
Week 2: Linear regression, Decision trees, overfitting
Week 3: Instance based learning, Feature reduction, Collaborative filtering based recommendation
Week 4: Probability and Bayes learning
Week 5: Logistic Regression, Support Vector Machine, Kernel function and Kernel SVM
Week 6: Neural network: Perceptron, multilayer network, backpropagation, introduction to deep neural network
Week 7: Computational learning theory, PAC learning model, Sample complexity, VC Dimension, Ensemble learning
Week 8: Clustering: k-means, adaptive hierarchical clustering, Gaussian mixture model

Books and references

1. Machine Learning. Tom Mitchell. First Edition, McGraw- Hill, 1997.
2. Introduction to Machine Learning Edition 2, by Ethem Alpaydin

Instructor bio

Prof. Sudeshna Sarkar

IIT Kharagpur

Prof. Sudeshna Sarkar is a Professor and currently the Head in the Department of Computer Science and Engineering at IIT Kharagpur. She completed her B.Tech. in 1989 from IIT Kharagpur, MS from University of California, Berkeley, and PhD from IIT Kharagpur in 1995. She served briefly in the faculty of IIT Guwahati and at IIT Kanpur before joining IIT Kharagpur in 1998. Her research interests are in Machine Learning, Natural Language Processing, Data and Text Mining.

Course certificate

The course is free to enroll and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.
The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).
Date and Time of Exams: **25 September 2022** Morning session 9am to 12 noon; Afternoon Session 2pm to 5pm.
Registration url: Announcements will be made when the registration form is open for registrations.
The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published. If there are any changes, it will be mentioned then.
Please check the form for more details on the cities where the exams will be held, the conditions you agree to when you fill the form etc.

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Average assignment score = 25% of average of best 5 assignments out of the total 8 assignments given in the course.
Exam score = 75% of the proctored certification exam score out of 100

Final score = Average assignment score + Exam score

YOU WILL BE ELIGIBLE FOR A CERTIFICATE ONLY IF AVERAGE ASSIGNMENT SCORE >=10/25 AND EXAM SCORE >= 30/75. If one of the 2 criteria is not met, you will not get the certificate even if the Final score >= 40/100.

Certificate will have your name, photograph and the score in the final exam with the breakup.It will have the logos of NPTEL and IIT Kharagpur.It will be e-verifiable at nptel.ac.in/noc (http://nptel.ac.in/noc).

Only the e-certificate will be made available. Hard copies will not be dispatched.

Once again, thanks for your interest in our online courses and certification. Happy learning.

- NPTEL team

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Government of India

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Department: Electronics and Telematics Engineering

2022-23

REPORT

FDP on Introduction to Machine Learning (NPTEL)

Date of program: 25-7-2022 to 16-9-2022

Resource person: Prof. sudeshna sarkar

I G. Krishna Reddy attended FDP on Introduction to machine learning.The following topics are coved. This course covered the fundamental concepts in machine learning and popular machine learning algorithms. I learned the python for ML and image processing applications.I learnt the standard and most popular supervised learning algorithms including linear regression, logistic regression, decision trees, k-nearest neighbour, an introduction to Bayesian learning and the naïve Bayes algorithm, support vector machines and kernels and neural networks with an introduction to Deep Learning. I understood the basic clustering algorithms. Feature reduction methods will also be discussed.I gained knowledge on ANN.. In the course we will discuss various issues related to the application of machine learning algorithms. I have gained knowledge on hypothesis space, overfitting, bias and variance, tradeoffs between representational power and learnability, evaluation strategies and cross-validation. The course is accompanied by hands-on problem solving with programming in Python and some tutorial sessions.

Signature of the Faculty member

G.Krishna Reddy ,Assoc.prof,ETE

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