BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY AND SCIENCE (A) :: BATLAPALEM

MASTER OF COMPUTER APPLICATIONS (MCA)

(For Two-Year PG Programme)

III Semester		L	T	P	C
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MACHINE LEARNING WITH PYTHON (23MC3T10)					

Course Objectives:

From the course the student will learn

- To design and analyze various machine learning algorithms and techniques with a modern outlook focusing on recent advances.
- Explore supervised and unsupervised learning paradigms of machine learning.
- To explore Deep learning technique and various feature extraction strategies.

Course Outcomes(CO's): At the end of the course, student will be able to

- Illustrate and comprehend the basics of Machine Learning with Python
- Demonstrate the algorithms of Supervised Learning and be able to differentiate linear and logistic regressions
- Demonstrate the algorithms of Unsupervised Learning and be able to understand the clustering algorithms
- Evaluate the concepts of binning, pipeline Interfaces with examples
- Apply the sentiment analysis for various case studies

UNIT I:

Introduction to Machine Learning with Python: Introduction to Machine Learning, basic terminology, Types of Machine Learning and Applications, Using Python for Machine Learning: Installing Python and packages from the Python Package Index, Introduction to NumPy, SciPy, matplotlib and scikit-learn, Tiny application of Machine Learning.

UNIT II:

Supervised Learning: Types of Supervised Learning, Supervised Machine Learning Algorithms: k-Nearest Neighbors, Regression Models, Naive Bayes Classifiers, Decision Trees, Ensembles of Decision Trees, Kernelized Support Vector Machines, Uncertainty Estimates from Classifiers.

UNIT III:

Building good training datasets: Dealing with missing data, Handling categorical data, partitioning a

University Nominee: Dr. Suneetha Eluri		Alumni Member Mr. Harisuresh Polisetti	
Subject Expert:1 Dr. B Kezia Rani,		Chairman : Mr. AVS M Ganesh	
Subject Expert: 2 Dr. Suneel Kumar Duvvuri		Member: Mr. G L N V S Kumar	
Representative from Industry, Mr. Narina Saikrishna			

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data set into separate training and test datasets, bringing features onto the same scale, selecting meaningful features, assessing feature importance with random forests. **Compressing data via dimensionality reduction**: Unsupervised dimensionality reduction via PCA, Supervised data compression via linear discriminant analysis (Text Book 2)

UNIT IV:

Learning best Practices for Model Evaluation and Hyperparameter tuning: streamlining workflows with pipelines, using k-fold cross validation to assess model performance, debugging algorithms with learning and validation curves, fine tuning machine learning models via grid search, looking at different performance evaluation metrics. **Combining different model sfor Ensemble learning:** learning with ensembles, combining classifiers via majority vote, bagging-building an ensemble of classifiers from bootstrap samples, leveraging weak learners via adaptive boosting (Text Book 2)

UNIT V:

Working with Text Data (Data Visualization): Types of Data Represented as Strings, Example Application: Sentiment Analysis of Movie Reviews, Representing Text Data as a Bag of Words, Stop Words, Rescaling the Data with tf-idf, Investigating Model Coefficients, Approaching a Machine Learning Problem, Testing Production Systems, Ranking, Recommender Systems and Other kinds of Learning.

Text Books:

1) Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Muller & Sarah Guido, Orielly Publications, 2019.
2) Python Machine Learning, Sebastian Raschka & Vahid Mirjalili, 3rd Edition, 2019.
3) Machine Learning using Python, Manaranjan Pradhan, U Dinesh Kumar, Wiley, 1st Edition, 2019

Reference Books:

1) Machine Learning, Tom M. Mitchell, Mc Graw-Hill Publication, 2017
2) Building Machine Learning Systems with Python, Luis Pedro Coelho, Willi Richert, 2nd Edition, 2015.
3) Programming and Problem Solving with Python, Ashok Namdev Kamthane, Amit Ashok Kamthane, TMH, 2019.

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