MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

- **Workshop Date: 5th – 6th March 2018 (2 days)**
- **Fees: 650/- per participant (Non Refundable)**
- **Venue: G.C.O.E., Jalgaon**
- **Certificate of Participation will be given to all participants.**
     (Only if participant is present on both days)
- **Participant should bring their own LAPTOP. Charging points will be provided.**

Prerequisites: Participants must have basic knowledge of any programming language C ++, R Programming or Python

You Will Learn How To

- A way to determine and measure problem complexity
- Python Programming
- ML Library Scikit , NumPy, Matplotlib, Pandas, Theano, TensorFlow
- Learning to solve statistics and mathematical concepts
- Supervised and unsupervised learning
- Classification and Regression
- ML Algorithms
- Machine Learning Programming & Use Cases
- Artificial Neural Network(ANN) Programming

DAY1:

- **Python Basics: Introduction to Python Programming**
  - What is Python
  - Understanding the IDLE
  - Python basics and string manipulation
  - lists, tuples, dictionaries, variables
  - Control Structure – If loop, For loop and while Loop
  - Single line loops
  - Writing user-defined functions
  - Working with Class & Inheritance

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➢ **Data Structure & Data Manipulation in Python**
- Intro to Numpy Arrays
- Creating arrays
- Indexing, Data Processing using Arrays
- Mathematical computing basics
- Basic statistics
- File Input and Output
- Getting Started with Pandas
- Data Acquisition (Import & Export)
- Selection and Filtering
- Combining and Merging Data Frames
- Removing Duplicates & String Manipulation

➢ **Understanding the Tools**
- Numpy, Pandas, Theano

➢ **Visualization in Python**
- Introduction to Visualization
- Visualization Importance
- Working with Python visualization libraries
- Matplotlib
- Creating Line Plots, Bar Charts, Pie Charts, Histograms, Scatter Plots

➢ **Artificial Intelligence & Machine Learning**
- Artificial Intelligence
- Environmental Constraints
- Various Agent Types
- PEAS Analysis of Problem
- Process flow for an AI agent

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- Machine Learning Introduction
- Supervised & Unsupervised Learning
- Regression & Classification Problems
- What makes a Machine Learning Expert?

➢ **Linear Regression**
- Regression Problem Analysis
- Mathematical modelling of Regression Model
- Gradient Descent Algorithm
- Use cases
- Regression Table
- Model Specification
- L1 & L2 Regularization

➢ **Linear Regression – Case Study & Project**
- Programming Using Python
- Building simple Univariate Linear Regression Model
- Multivariate Regression Model
- Apply Data Transformations
- Identify Multicollinearity in Data Treatment on Data
- Identify Heteroscedasticity
- Modelling of Data
- Variable Significance Identification
- Model Significance Test
- Bifurcate Data into Training / Testing Dataset
- Build Model of Training Data Set
- Predict using Testing Data Set
- Validate the Model Performance
- Best Fit Line and Linear Regression

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DAY2:

➢ Logistic Regression

- Introduction
- Assumptions
- Where you apply Logistic Regression
- Reason for the Logit Transform
- Logit Transformation
- Hypothesis
- Variable and Model Significance
- Maximum Likelihood Concept
- Log Odds and Interpretation
- Null Vs Residual Deviance
- Chi-Square Test
- ROC Curve
- Model Specification
- Case for Prediction Probe
- Model Parameter Significance Evaluation
- Drawing the ROC Curve
- Estimating the Classification Model Hit Ratio
- Isolating the Classifier for Optimum Results

➢ Artificial Neural Networks with Case Study

- Neurons, ANN & Working
- Single Layer Perceptron Model
- Multilayer Neural Network
- Feed Forward Neural Network
- Cost Function Formation
- Applying Gradient Descent Algorithm
- Backpropagation Algorithm & Mathematical Modelling
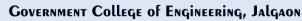- Programming Flow for backpropagation algorithm
- Use Cases of ANN

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- Programming SLNN using Python
- Programming MLNN using Python
- Digit Recognition using MLNN
- XOR Logic using MLNN & Backpropagation

For any further info:
Coordinator: Sachchak Waghmare (7620558850)
Co-coordiantor: Aditya Rokade - M/C Learning & AI (7767023353)
Website: https://technoarena.gcoej.ac.in/workshop

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WORKSHOP RULEBOOK

1. Fees for each workshop is **650/- INR** per participant, which once paid is non-refundable.

2. It is compulsory for all participants to bring their college ID card during workshop.

3. For **AI & Machine learning** workshop participant must bring his own laptop. College will NOT provide any computer system. Only charging points will be provided.

4. For **IoT workshop** kits will be provided in group of 4 participant. It is advised that participant form their own group, if not organizers will form group at random. Kits will only be provided for duration of workshop and taken back after workshop. Interested group/participant can buy kit on spot.

5. For **IoT workshop** each group must have atleast one laptop in their group. College will not provide any computer system. Only charging points will be provided.

6. Participants will have to report at sharp 7.30 am on 5th March 2018 for workshop registration. Workshop will start from 8:00 am.

7. Snacks & Tea will be provided during break.

8. Hospitality (accommodation + dinner) will be provided to participant in college student's hostel on payment of nominal fees. For more details contact Hospitality Team.

9. Certificate will be provided to only those candidates who will attend the workshop for complete two days.

10. Organizers reserve the right to cancel any workshop at any moment and modify any rule without prior notice. Organizers decision will be final and binding to all participants.

For any further info: Coordinator: Sachchak Waghmare (7620558850)
Co-coordiantor: Akash Bhosale - Automotive Mechanics (7798679796)
Co-coordiantor: Aditya Rokade - AI & M/C Learning (7767023353)
Co-coordinator: Uday Devikar - IOT & RasPi (80874 36966)
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