Event Report

One Week National Level Short Term Training Program
Data Mining and Soft Computing: Tools and Techniques
18th – 23rd December, 2017

Partially Sponsored by

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Charutar Vidya Mandal

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Organized by

Department of Information Technology
G H Patel College of Engineering & Technology, Vallabh Vidyanagar

Over recent years, with the arrival of high speed internet connections and advancement in related technologies, we have observed the generation and transmission of large volumes of data over internet during the last decade. Data Mining and Soft Computing have established themselves as major disciplines in Computer Science with growing industrial impact. There is a requirement of new mining techniques which can address the unique challenges raised due to the volume, variability and velocity of such data. With these objectives, A Short Term Training Program (STTP) on "Data Mining and Soft Computing: Tools and Techniques" was organized by Department of Information Technology at G H Patel College of Engineering and Technology, Vallabh Vidyanagar from 18th December to 23rd December, 2017. A total of 61 participants, including UG/PG students and Faculties / Research Scholar from 15 different Degree and Diploma Engineering Institutes of the nation have registered for the event.

Inaugural Function

Inaugural function was held on 18th December, 2017 at 10:30 AM in Smt. Kamlaben Sankarbhai GCET Seminar Room. Dr. Nikhil Zaveri, Director General, Charutar Vidya Mandal was the president and Prof. Himanshu B. Dave, Senior Consultant, E-Infochips, Ahmedabad was the chief guest for the function. The inaugural ceremony was also graced by Dr. Himanshu B. Soni, Principal, GCET.

Dr. Nikhil Gondaliya, Convener of the STTP and Prof. Nirav Raja, Co-Convener of the STTP were amongst dignitaries on the dais. Inaugural was started with a prayer. After which, introduction and felicitation was done for president, chief guest and principal. After lighting lamp, Dr. Himanshu Soni gave the introduction of the college to all the delegates. He also highlighted the need of research and quality education in engineering. Followed by that, Dr. Nikhil Gondaliya provided the information about IT department and about STTP to all the delegates.

Next, Prof. Himanshu B. Dave addressed the gathering. He discussed about the advancement in technology during the last few decades. He also stressed on the need of such training program on specialized topics. Followed by that, Dr. Nikhil Zaveri provided his presidential remarks. He explained the importance of data gathering and analysis using some real time examples.

The ceremony was concluded with a vote of thanks by Prof. Nirav Raja which was followed by national anthem and Group photo session.

Dignitaries on the Dias

Lightning the Lamp

Dr. Nikhil Gondaliya
HOD (IT) & Convener, STTP

Dr. Himanshu Soni
Principal, GCET

Prof. Himanshu B. Dave
Senior Consultant, E-Infochips, Ahmedabad

Dr. Nikhil Zaveri
Director General, Charutar Vidya Mandal

Prof. Nirav M. Raja
Assistant Professor (IT) & Co-Convener, STTP

Organizing Committee Members

Key Note Speech

The very first session in the STTP was the keynote speech by **Prof. Himanshu B. Dave**. He has given a session on topic "BD, ML and DL - some thoughts". In the beginning, he provided overview of big data, machine learning and deep learning. After this, he introduced few tools and packages like: R studio, Python – Tensor flow and kenas, Caffe, H2O, open CV, hadoop, spark and cloud based services. He also explained how to develop a perfect model for fitting data and discussed the problem of over-fitting and under-fitting of data. He introduced few post visualization tools for deep learning i.e. ggplot, R and matplot libray (python).

Expert Talk and Hands-on Sessions

During the period of one week of STTP, the following experts in the domain of STTP have shared their knowledge and experiences with the participants.

Day 1, Session 1:

Dr. Maulika Patel, Head of the Department, Computer Engineering Department, GCET has given talk on topic **"Artificial Neural Network and its applications".** She explained the architecture of Artificial Neural Network (ANN) which includes discussion on number of input, output, hidden layers, neurons, rounds etc. She explained working of ANN model with examples. She also covered some key points of deep learning and how it differs from machine learning. After this, she discussed her PhD thesis problem and introduced the basics of protein folding.

Day 1, Session 2:

This Hands-on session was given by **Prof. Priyang Bhatt** on **"Data analytics using Python"**. He is an Assistant Professor in Computer Engineering Department, GCET. He explained the use of ready packages of Python for Machine Learning. He also explained the basic terms of data mining like dataset, training, testing etc. He showed the working of Machine Learning in python. He explained how to use functions of built in packages for data mining

– how to import package, how to import dataset, how to partition dataset for training and testing, how to train, how to test etc.

Day 2, Session 1:

Dr. Mayuri Mehta, Professor, Computer Engineering Department, SCET, Surat has given talk on topic **"Parallel and Distributed Data Mining"**. Expert has covered details of basic data mining, how it is used, what are the key reasons to use data mining now a days including various algorithms and techniques of data mining. She thrown some lights on some of the areas of her research and discussed about open research issues in the domain of parallel and distributed data mining.

Day 2, Session 2 and 3:

Dr. Dharmesh P. Raykundaliya, Assistant Professor, Department of Statistics, Sardar Patel University, Vallabh Vidyanagar has delivered a theory and hands-on session on "**Statistical Analysis through R language**". The content of session was organized such a way that everyone has something to add to knowledge bank. Session was started by introducing R tool and its application. Demonstration of various tools was given by the expert. Participant were satisfied with the way content was delivered and they have also realized efficiency of tool for real time application. Expert has also discussed future possibility and job opportunity for the experts of R tool at the end of session.

Day 3, Session 1:

Dr. Amit Thakkar, Associate Professor, Information Technology Department, CHARUSAT, Changa was expert for this session. He delivered talk on "**Recommendation Systems**". He discussed in-detail aspects of how recommendation systems are working, what are the prospects of it along with pros and cons. Details about various career opportunities was given by the expert. Expert has also discussed about the future possibilities of research in the field of big data analytics. The information given by expert was extremely helpful to the participant.

Day 3, Session 2 and 3:

Dr. Hitesh Chhikaniwala, Associate Professor, Adani Institute of Infrastructure Engineering, Ahmedabad has conducted a Theory and Hands-on Session on "**Data Stream Mining and Privacy Preserving Data Mining**". Expert has discussed vividly about privacy detection techniques in first half of lecture. He has shown some algorithms and tricks for privacy preserving in data. Expert has also discussed some of recent issues in the privacy preserving data mining. During second half of the lecture, an expert has shown practically how to use data mining techniques using Massive Online Analysis (MOA) and WEKA tool.

Day 4, Session 1:

Dr. Amit Ganatra, Professor and Head of the Department, Information Technology Department, CHARUSAT, Changa has conducted this session. He explained some "**Basic concepts of data mining, soft computing and deep learning".** He explained important parameters of the ANN like learning rate, momentum, activation function, EPOC etc. He also explained the differences and application of the CNN & RNN. He also explained the functionalities and usage of various tools like: WEKA, Neuro intelligence, EassyNN+, Tanagra, Orange, Sipina research and R GUI. He explained regression and sampling techniques at the end of session.
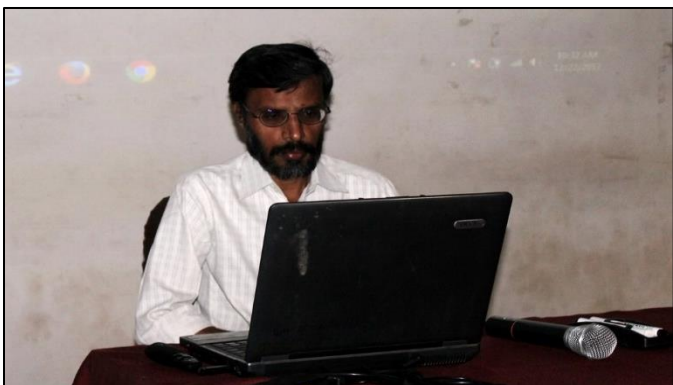
Day 4, Session 2 and 3:

Expert for the session was **Dr. Priyank Thakkar**. He is an Associate Professor at Computer Engineering Department, Institute of Technology, Nirma University, Ahmedabad. He started his sessions by explaining the "**Various methods of Machine Learning**" – supervised learning, unsupervised learning, semi supervised learning and reinforcement learning. He explained the supervised learning model well with the examples. He introduced the artificial neural network and its architecture. He also explained how to build a model for given problem and data set. He also provided some of the open problems for research.

Day 5, Session 1:

Prof. Rajesh Sanghvi, Assistant Professor, ASH Dept., GCET was expert for the session. Title of his talk was **"Introduction to Evolutionary Algorithms"**. He has explained various problems like knapsack problem, traveling sales man problem, bin packing problem etc. He also discussed how each and every problem is more or less an optimization problem. Every optimization problems require the mathematics and hence he has explained few optimization techniques. He also explained few evolutionary algorithm like Genetic Algorithm, Particle Swarm Optimization etc. He explained few examples that can be solved by using evolutionary algorithms.

Day 5, Session 2 and 3:

Dr. Brijesh Bhatt, Associate Professor, Computer Engineering Department. DDU, Nadiad was invited speaker for the session. He delivered a talk on "**Introduction to Deep Learning and its Applications**". Firstly, he introduced deep learning, machine learning, SVM etc. Then he discussed architecture of convolution neural network and recurrent neural network. He also discussed some real time applications and the challenges in this area. After this, he explained working of some packages of soft computing like Python - keras and tensor flow. He explained an example code of machine learning in python.

Day 6, Session 1:

Dr. Nithin George, Assistant Professor, Electrical Engineering Department, IIT – Gandhinagar has delivered a talk on "**Introduction to Fuzzy Logic**". He has explained design of fuzzy logic system with some real time examples. He explained how to convert any system into fuzzy system. He explained implementation of fuzzy logic using Matlab tool. After that he explained importance and usefulness of optimization techniques like Genetic Algorithms, Particle Swarm Optimization, Fish Swarm Optimization, Cat Swarm Optimization, and Multi Objective Optimization.

Valedictory Function

The valedictory session was conducted in the afternoon hours at 1:30 PM on 23rd December, 2017. Participants were shared their feedback about the STTP. All the participants gave the positive feedback about the STTP and welcomed the initiative. Certificate and a group photo were distributed to all the participants. The ceremony was concluded by a vote of thanks.

Sharing of Feedback

Prof. Premkumar Balani
Assistant Professor (IT) & Co-Convener, STTP

- Group Photo -