

BRIEF REPORT

ON

**AICTE SPONSORED STAFF DEVELOPMENT
PROGRAMME**

ON

**“SOFT COMPUTING TECHNIQUES AND ITS
APPLICATIONS TO ENGINEERING”**

SUBMITTED TO

**ALL INDIA COUNCIL FOR TECHNICAL EDUCATION
Indira Gandhi Sports Complex, I.P.Estate
New Delhi – 110 002**

Prepared By

**Dr. Dhruva C. Panda
Co-ordinator**

SUBMITTED BY

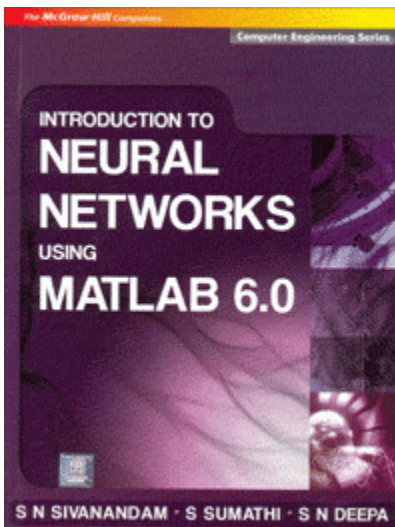


**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
JAGANNATH INSITUTE FOR TECHNOLOGY AND MANAGEMENT
PARALAKHEMUNDI-761211**

Acknowledgement

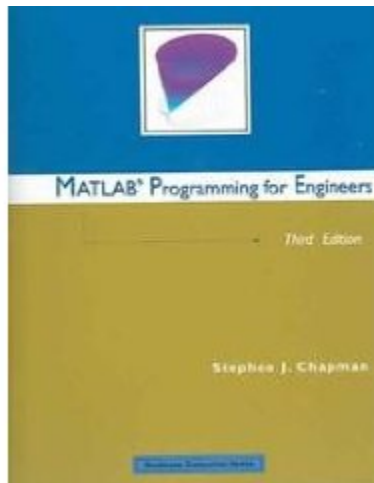
Department of Electronics and Communication Engineering grateful to

1. **The McGraw-Hill Companies** for Providing 20(twenty) copies of **“Introduction to Neural Networks Using Matlab 6.0”** by **S. N. Sivanandam, S. Sumathi and S. N. Deepa**



and

2. **CENGAGE Learning** for providing 20(twenty) copies of **“Matlab Programming for Engineers”** by **Stephen J. Chapman**



as additional reading materials to the participants.

BRIEF REPORT ON AICTE SPONSORED STAFF DEVELOPMENT PROGRAMME ON “SOFT COMPUTING TECHNIQUES AND ITS APPLICATIONS TO ENGINEERING”

Introduction

Soft Computing Techniques(Artificial Neural Networks, Genetic Algorithms, Fuzzy Logic Models, Particle Swarm Techniques) have been recognized as attractive alternatives to the standard, well-established “hard computing” paradigms. Traditional hard computing methods are often too cumbersome for today’s problems. They always require a precisely stated analytical model and often a lot of computational time. Soft computing techniques, which emphasize gains in understanding system behaviour in exchange for unnecessary precision, have proved to be important practical tools for many contemporary problems. NNs and FLMs are universal approximators of any multivariate function because they can be used for modeling highly nonlinear, unknown, or partially known complex systems, plants, or processes. Genetic Algorithm and Particle Swarm Optimization Techniques have emerged as potential and robust optimization tools in recent years. The course contents will be taught by eminent experts in the field, having adequate teaching and research experience. This course will be beneficial to faculty from all engineering disciplines as a potential computing tool in their research activities. This course is aimed at newly recruited teachers (Less than five years Experience), designed from the basic concepts to application and reviews.

Objective of the Programme

- This course will provide a comprehensive and structured exposure to Soft Computing Techniques i.e Artificial Neural Networks, Fuzzy Logic, Genetic Algorithm, Particle Swarm Optimization.
- Exposure to Matlab Programming Language and Matlab Tool Boxes.
- Use of Matlab Tool Boxes for implementation of Soft Computing Techniques for solving Engineering Problems.
- Use of Matlab Programming Language for implementation of Soft Computing Techniques for solving Engineering Problems.

Programme Schedule

The programme is designed in such away that, the participant starts with concept of soft computing techniques and algorithm development of Soft Computing Techniques. The first week is devoted to Theory and Matlab Programming language. The second week is devoted to implement the algorithm to solve typical engineering problems using tool box and at Matlab Code label. The detailed Programme schedule is enclosed in Annexure-I.

Execution of the Programme

With the above objective in mind JITM has applied to All India Council for Technical Education (AICTE) under Staff Development Programme Scheme in August 2007. The Council has approved the Programme and sanctioned Rs. 2, 00,000/- (Rupees Two Lakhs only) in the month of March 2008. The

Staff Development Programme Details in the form of Brochure were sent in the first week of October 2008 to nearly 450 Engineering Colleges throughout the country, out of which 50 applicants responded within the stipulated time (13-11-08). After thorough screening, intimations to the selected twenty participants were sent by E-mail and Telephone. Details of Participants are enclosed in Annexure-II.

Resource Persons

The resource persons with various specializations are mainly drawn from Electronics and Communication Engineering Department of JITM, Prof(Dr) Shyam Sundar Pattnaik, HOD, Dept. of ECE, NITTTR, Chandigarh and Dr.Subhasis Bhoumik of Mechatronics Department, Bengal Engineers in and Science University, West Bengal, delivered keynote address on Inaugural session. The details are presented in Annexure-III.

Course Material Details

The course material is prepared in two volumes. The first one “**Soft Computing Techniques Theory and Practice**” is exclusively prepared for training the participants in the Matlab Tool box and Coding label. It includes theory and step by step procedure in these softwares. It is published with color cover and back pages in hard bound fashion.

The second one contains the lecture notes of the invited outstation resource persons and in-house resource persons. It is published in softbound fashion.

The above two books along with 100 page long note book with the entire programme schedule as back page were handed over in an executive bag to the participants in the inaugural session on 01-12-08.

Inaugural Session

The programme was inaugurated by **Dr. Shyam Sundar Pattnaik**, Professor and Head, Dept. of ECE and ETV, NITTTR, Chandigarh, on 01-12-08 at 9.00 AM in the JITM Seminar Hall in the CSREM Campus. Dr. C. V. Gopinath, Principal, JITM, Dr. Subhasis Bhoumik, Asst. Professor, BESU, West Bengal and co-ordinator, Dr.D.C. Panda spoke on this occasion. Dr. D. C. Panda, Co-ordinator presented a report on the program. Keynote address on “Introduction and overview of Soft Computing Techniques” presented by the **Chief Guest Dr.S.S.Pattnaik**. The program was attended by all the Principals, along with other Heads of the Departments and Professors. Some Important Photographs of inauguration and rest of the program are enclosed in Annexure-IV. Press clippings are enclosed in Annexure-V.

Boarding and Lodging Arrangements to Participants

All the participants were accommodated in JITM College Hostels. Double rooms were provided for all participants. Lunch arranged for all resource persons, supporting staff along with participants in the Class Room Vanue itself. Dinner arranged only for participants in the Staff Cafeteria.

Valedictory Session

Valedictory session was organized on the last day of the programme i.e. 13th Dec 2008 in the Seminar Hall of JITM, CSREM Campus. Dr. C. V. Gopinath, Principal, JITM, presided the function. Er.D.K.Sahoo, HOD, ECE Department and Dr. D.C.Panda, Co-ordinator, spoke on this occasion. Some of the participants responded with their feedback. Certificates to the participants were distributed by Dr.C.V.Gopinath. Dr.D.C.Panda, Co-ordinator concluded the meeting with Vote of Thanks.

ANNEXURE I

| AICTE SPONSORED STAFF DEVELOPMENT PROGRAMME | | | | | | | | |
|---|----------|--------------------------------------|------------------------|---------------------------------|---|--|------------------------------------|---|
| SOFT COMPUTING TECHNIQUES AND ITS APPLICATIONS TO ENGINEERING | | | | | | | | |
| DAY | DATE | Morning Session | | | LUNCH BREAK | Afternoon Session | | |
| | | 9.00 -10.45 | TEA/COFFEE BREAK | 11.00 -12.45 | | 2.00 – 3.30 | TEA/COFFEE BREAK | 3.45 – 5.00 |
| MON | 1-12-08 | Inauguration | | TEA/COFFEE BREAK | Introduction and Overview of Soft Computing Techniques(SSP) | LUNCH BREAK | | Technical Talk Robotics (SB) |
| TUE | 2-12-08 | ANN Fundamentals(SSP) | ANN Fundamentals(SSP) | | RBF Neural Network(SSP) | | Application of ANNSSP) | |
| WED | 3-12-08 | GA(DCP) | GA(DCP) | | Introduction to Matlab (GG & AKM) | | Introduction to Matlab (GG & AKM) | |
| THU | 4-12-08 | Fuzzy Logic(KNR) | Fuzzy logic(KNR) | | Fuzzy Applications Lab(KNR) Using Matlab | | Fuzzy Applications Lab(KNR) Matlab | |
| FRI | 5-12-08 | Back Propagation(DCP) | Back Propagation(DCP) | | Perceptron Lab(Matlab Tool box) GG | | Backprop Lab(Matlab Tool Box) GG | |
| SAT | 6-12-08 | Simulink(GG) | Programming Matlab(SM) | | Programming Matlab(SM) | | Programming Matlab(GG) | |
| SUN | 7-12-08 | Differential Evaluation(PKH) | Clonal Algorithm(PKH) | | Product Demo | | Leadership Development | |
| MON | 8-12-08 | STUDY TOUR | | | | | | |
| TUE | 9-12-08 | GA Lab(DCP) | TEA/COFFEE BREAK | Programming Matlab (SM) | LUNCH BREAK | Perceptron Coding Lab(DCP) | TEA/COFFEE BREAK | Perceptron Coding Lab (DCP) |
| WED | 10-12-08 | Problem Implementation DCP | | Problem Implementation DCP | | Problem Implementation DCP | | Problem Implementation DCP |
| THU | 11-12-08 | Knowledge Based Neural Network (RKM) | | Functional Neural Networks(RKM) | | Time Series Prediction & Financial Forecasting (RKM) | | Applications in RF & Microwave Circuits (RKM) |
| FRI | 12-12-08 | PSO(DCP) | | PSO(DCP) Lab | | GA and Power System(DR) | | Fuzzy Logic Application to Power System(DR) |
| SAT | 13-12-08 | Bacteria Foraging(MN) | | Lab(MN) | | Valedictory, feed back | | |

SSP: Dr. S.S.Pattnaik

RKM: Dr. R. K. Mishra

SB: Dr. Subhasis Bhoumik

PKH: Dr. P. K. Hota

SM: Prof. Satyasis Mishra

KNR: Dr. K Narayan Rao

DR: Prof. Debasis Rath

DCP: Dr. D. C. Panda

GG: Prof. G. Girish

MN: Prof. Monoj Naik

AKM: Prof. Arul Kumar

ANNEXURE II

Details of Participants

| Sl No | Name and Contact Address | Sl No | Name and Contact Address |
|-------|--|-------|---|
| 1 | MR.RABATI R. DEVANGAN Lecturer Dept. of IT MPC CET Bhilai, Chhatissgarh revati2004@rediffmail.com | 16 | MISS.TAMASASHREE SINGH Lecturer Dept. of EEE JITM, Paralakhemundi-761211 tamasashree.singh@gmail.com |
| 2 | MR.B.SRIDHAR Lecturer Dept. of IT MPC CET Bhilai, Chhatissgarh sridhar_825@yahoo.co.in 09752727860 | 17 | MR.P. MOHAPATRA Lecturer Dept. of Maths JITM, Paralakhemundi-761211 |
| 3 | MR.MRINMAYA CHAKRABARTI Lecturer Dept of ECE MCET, West Bengal chakraborty_wb@yahoo.co.in | 18 | MR.BHARAT K. PADHI Lecturer Dept. of IT JITM, Paralakhemundi-761211 |
| 4 | MR.SUKANT KUMAR DAS Dept. of Cryogenic Engineering IIT Kharagpur | 19 | PROF. K. PARVATHI Asst. Professor Dept. of ECE JITM, Paralakhemundi-761211 parvathi_kodimela@yahoo.com 9437434785 |
| 5 | MR.MANIK CHAND PATNAIK Sr.Lecturer, Dept.of CSE, Roland Institute of Technology, SuryaVihar, Bhaliaguda – 761008 myself@manik.in | 20 | MR.NEERAJ KUMAR Lecturer Dept. of ECE JITM, Paralakhemundi-761211 kumar.neeraj@jitm.ac.in 9778098394 |
| 6 | MR.SANJIT KU ACHARYA Sr.Lecturer, Dept.of CSE, Roland Institute of Technology, SuryaVihar, Bhaliaguda - 761008. acharyasanjit@rediffmail.com 98610 36322 | 21 | MR.ARUL KUMAR M Sr. Lecturer Dept. of ECE JITM, Paralakhemundi-761211 |
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| 7 | MR.JAYA KRUSHNA MAHARANA Asst.Prof. Department of Electrical Engineering B.I.E.T,Barapada,Bhadrak,Orissa jkrushna@rediffmail.com | 22 | MR.PRBHAT KUMAR PATNAIK Lecturer Dept. of ECE JITM, Paralakhemundi-761211 prabhat.patnaik@gmail.com 9861374646 |
| 8 | MR.S.KUMARESAN Senior Lecturer Department of Maths Institute of Road and Transport Technology cks_kumaresan@yahoo.co.in | 23 | MR.SHIBASIS PRADHAN Lecturer Dept. of ECE JITM, Paralakhemundi-761211 shibashispradhan@gmail.com 9337163638 |
| 9 | MR. RATNAKAR DAS Cryogenic Engineering IIT Kharagpur | 24 | MISS.DURGA RANI MAHALIK Lecturer Dept. of ECE JITM, Paralakhemundi-761211 |
| 10 | MR. HARISH CHANDRA MOHANT Lecturer Dept. of ECE CIT, Bhubaneswar | 25 | MISS.ARPITA ACHARYA Lecturer Dept. of ECE JITM, Paralakhemundi-761211 arpitaacharya@yahoo.co.in 9437662340 |
| 11 | MR.JATINDRA KUMAR DASH Asst. Professor Dept. of CSE JITM, Paralakhemundi-761211 Jatin808in@yahoo.co.in 9437513152 | 26 | MR.G.GIRISH Lecturer Dept. of ECE JITM, Paralakhemundi-761211 ggirish@jitm.ac.in 9437262356 |
| 12 | MRS.SASMITA PADHY Asst. Professor Dept. of IT JITM, Paralakhemundi-761211 pinkypadhy@rediffmail.com 9437641779 | 27 | MR.D.K.SAHOO Sr. Lecturer Dept. of ECE JITM, Paralakhemundi-761211 debu452@rediffmail.com 9437504475 |
| 13 | MR.SATYANARAYANA PADHY Lecturer Dept. of EIE JITM, Paralakhemundi-761211 satyanarayan.padhy@gmail.com 9438251062 | 28 | MR.SATYASIS MISHRA Asst. Professor Dept. of ECE JITM, Paralakhemundi-761211 satyasismishra@yahoo.co.in 9861085467 |
| 14 | MR.BINOD KUMAR PADHY Lecturer Dept. of EIE JITM, Paralakhemundi-761211 binod.padhi@gmail.com 9861647539 | 29 | MR.PRASANT KUMAR Lecturer Dept. of ECE JITM, Paralakhemundi-761211 |

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| 15 | MR.A. DEVADIPTA Lecturer Dept. of EIE JITM, Paralakhemundi-761211 litun3@gmail.com 9861040712 | | |
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Annexure III Details of Resource Persons

| SL. No | Name Of The Resource Person | Designation | Organization | Specialization | Topics covered |
|--------|-------------------------------|------------------------------|----------------------------|--------------------------------------|---|
| 1. | Prof(Dr)Shyam Sundar Pattnaik | Professor | NITTTR, Chandigarh | Soft Computing Techniques | Introduction and overview of Soft Computing Techniques, RBF NN and Overview of evolutionary optimization techniques |
| 2. | Dr.Subhasis Bhoumik | Asst. Professor | BESU, West Bengal | AI and Mechatronics | Application of AI and Robotics |
| 3. | Dr.K.Narayan Rao | Asst. Professor | Vishakhapatnam Polytechnic | Fuzzy Logic | Theory and Application of Fuzzy Logic |
| 4. | Dr.P.K.Hota | Professor | UCE of Burla | Evolutionary Optimization Techniques | Clonal and DE Optimization and its application to power system |
| 5. | Dr.R.K.Mishra | Professor | Berhampur University | Neural Networks | Functional NN, Knowledge Based NN and their application to time series forecasting and microwave circuit design |
| 6. | Dr.D.C.Panda | Asst. Professor | JITM | Soft Computing Techniques | BP Algorithm, GA and PSO and their implementation |
| 7 | Mr. Satyasish Mishra | Asst. Professor | JITM | Matlab | Matlab Programming |
| 8 | Mr. G.Girish | Lecturer | JITM | Matlab | Matlab Tool Boxes and Simulink Modeling |
| 9 | Mr.Manoj Naik | Sr. Lecturer | JITM | Bacteria Foraging | Bacteria Foraging and its application to image processing |
| 10 | Mr.Debasish Rath | Asst. Professor | JITM | Genetic Algorithm and Fuzzy Logic | GA and Fuzzy Logic application to power system |
| 11 | Mr.Arul Kumar | Sr. Lecturer | JITM | Matlab | Matlab Coding Techniques |
| 12 | Mr.S.C.Shekhar | Training & Placement Officer | JITM | OB | Leadership Quality Development |

Annexure IV

Important Photographs



Dr. C. V. Gopinath, Principal, JITM, along with Dr.S.S.Pattnaik and Dr. Subhasis Bhoumik Inaugurating the AICTE Staff Development Programme.

Mr.Jogi Jagarntah Raju, trustee member, Presenting a Memento to the Chief Guest Dr.S.S.Pattnaik, Professor, NITTR, Chandigarh



Dr.S.S.Pattnaik presenting his inaugural talk on introduction and overview of soft computing techniques



Important Photographs (Continued)

Participants listening the lecture



Participants attending Lab Session of Dr.K.Narayan Rao, Vishakhapatnam Polytechnic on Fuzzy Logic

Group Photo of Participants with Resource persons and Supporting staff





Dr.C.V.Gopinath, Principal, JITM distributing certificates to the Participants.

Participant receiving a token of horn handicraft for good performance in the Programming Session



Participant commenting about the pros and cons of the programm

