

5-Days Short Term Course
on
“Application of Machine and Deep Learning in Engineering Problems”
Financially Sponsored by
TEQIP-III and Technically supported
by SCOPE

April 09-13, 2020

Organized By
Department of Instrumentation and Control Engineering



Dr. B. R. Ambedkar National Institute of Technology Jalandhar, Punjab



About NIT Jalandhar

Dr. B. R Ambedkar National Institute of Technology Jalandhar was established in the year 1987 as Regional Engineering College and was given the status of National Institute of Technology by the Government of India on October 17, 2002 under the aegis of Ministry of Human Resource Development, New Delhi. As an Institute of National Importance, it imparts high quality technical education in Engineering, Technology and Science to produce competent technical manpower for the country. The institute offers Bachelor of Technology (B.Tech.) programme in nine disciplines of Engineering and Technology along with the research programmes leading to Master of Technology (M.Tech.) and Doctor of Philosophy (Ph.D). As per the survey conducted by NIRF, DQ-CMR best technical school survey and India Today-MDRA Best Colleges Ranking in the year 2018, the institute was ranked 74th, 18th and 22nd respectively, amongst all engineering institutions, including IITs in the country.

About Department of Instrumentation and Control Engineering

The Department of Instrumentation and Control Engineering commenced its Bachelor of Technology (B. Tech.) degree programme in 1990, M Tech (Full Time) degree programme in Control & Instrumentation Engineering w.e.f. July, 2006 and M Tech (Part-Time) Programme w.e.f. July, 2010. The Ph.D. Programme has also been offered since 2005 in various disciplines of Instrumentation and Control Engineering. This department has 15 regular faculties. Research in the department is at the leading-edge of technological innovations and encompasses all major areas of Instrumentation and Control Engineering. The department has unique research facilities that enable leading-edge research in many areas such as Computer Vision, Process Optimization, Renewable Energy, Robotics and Automation, Process Control, Biomedical Instrumentation, Sensors and Wireless Networking, IOT and Intelligent Control Systems. These facilities provide

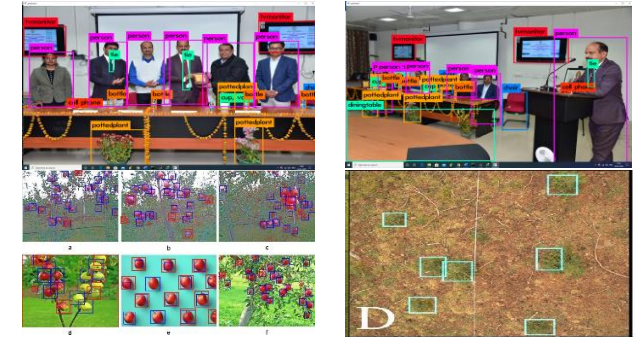
an excellent opportunity for graduate students and research scholars to be trained and gain valuable experience. The department is consolidating its efforts to promote industrial research and consultancy in relevant areas. The department has supervised more than 15 Ph.D Thesis and having the present strength of more than 20 research scholars. Also, the department has credit of more than 10 patent as well as more than 200 research article in highly reputed journals with high impact factor such as Renewable and Sustainable Energy Reviews (10.556) in last five years.

Objectives of the Course

The objectives of this course are two-fold-

(i) To provide a mathematical understanding of various Machine learning classification, detection, tracking and optimization methods.

(ii) To make participants familiar with commonly used tools and models for Machine learning classification, detection, tracking and optimization tools through hands-on-sessions.



Course Contents:

- Introduction to Machine Learning, Deep Learning, Soft computing, and Optimization Techniques
- Basics of AI & Introduction to ANN
- Linear Regression
- Decision Trees
- Support Vector Machine
- Image Processing with OpenCV
- Deep Learning Networks: Introduction to Tensor Flow

- Convolutional Neural Networks and its Application to Classification, Detection and Tracking Problems
- Machine Learning Model Optimization
- Introduction to Optimization techniques
- Novel meta-heuristic algorithms, machine learning and advance computing
- Multiobjective optimization, Scheduling and planning
- Hands-on Experience

Resource Person

Prof. Durga Toshniwal, IIT Roorkee
 Prof. Rajeev Kumar, JNU, New-Delhi
 Prof. T. V. Vijay Kumar, JNU, New-Delhi
 Prof. Subramanian Balasundaram, JNU, New-Delhi
 Dr Manojkumar Ramteke, IIT Delhi
 Dr. Arnav Bhavsar, IIT Mandi
 Dr. Dileep A. D., IIT Mandi
 Dr. Partha P. Roy, IIT Roorkee

General Information

- The course is open to Industry professionals, Faculty, research scholars and students from recognized Engineering colleges.
- Only limited seats (40) are available in this course. The registration fee (**Non-Refundable**) for all participants is **INR 1000/-** to be submitted in form of **DD in favor of “The Director NIT Jalandhar” payable at Jalandhar**. The duly signed application form along with payment details should reach to **vermaop@nitj.ac.in** latest by **05.04.2020**.
- Accommodation can also be arranged on request at ‘**Guest House of Mega Hostel**’ on twin sharing basis at @ **Rs. 300/- per day per person**.

Contact Person:

1. Mr. Sunil Kumar (9518150139) ; Mr. Nitish Kumar (8219707478); Mr. Himanshu Gupta (9919509201); Mr. Shubham Gupta (9406971022); Mr. Rahul Bisht (9690429545)
2. Mr. Saurav Kumar (8349135553); Mr. Newton (8917486545); Vijay (9540295772).

- **Registration Fee/Demand Draft** will **NOT** be refunded once the registration has been completed.
- No Travelling Allowance will be paid by the Host Institute/Academy.

Patron

Prof. L. K. Awasthi, Director, NIT Jalandhar

Guest of Honor(s)

Prof. Rajeev Kumar, School of Computer & Systems Sciences, JNU New-Delhi
 Dr. S. K. Mishra, Registrar, NIT Jalandhar

Co-Patrons

Dr. Rajesh Singla, Head of Department, ICE
 Prof. Dilbag Singh, Head of Department, EE

Chief-Convener

Dr. K.S. Nagla
 Associate Professor, Department of ICE

Convener

Dr. Om Prakash Verma
 Assistant Professor, Department of ICE

Coordinator(s)

Dr. Afzal Sikander
 Dr. Amit Kumar Singh
 Assistant Professor(s), Department of ICE

Departmental Advisory Committee

- | | |
|--------------------|-------------------|
| • Prof. A. K. Jain | • Dr. Sathiya S |
| • Dr. S.K Pahuja | • Dr. Karan Jain |
| • Dr. Roop Pahuja | • Dr. Ravi Verma |
| • Dr. S Tiwari | • Dr. K. Chandra |
| • Er. N Singh | • Dr. V. Sharma |
| • Dr. Karan Veer | • Dr. Harimurugan |

Application Form for
 Short Term Course (STC)
 on

“Application of Machine and Deep Learning in Engineering Problems”

April 09-13, 2020

1. Name: Ms./Mr./Dr.
 (In Block Letters)
 2. Designation: 3. Age (Years):

4a. Complete Residential Address:

Email:..... Mobile:

4b. Complete Official Mailing Address:

Email:..... Mobile:

5. Academic Qualification (Degree onwards):

6. Specialization:

7. Teaching Experience in Years (if):

8. Payment Details: DD No.:.....

Bank.....Branch.....

Date:..... Accomodation Required: YES () / NO ()

Signature of applicant

Important Note:

1. This application form should reach the office latest by **05.04.2020**
2. Application without Payment details will not be entertained.
3. Please note that 100% attendance is compulsory in the course.

SPONSORSHIP CERTIFICATE

The applicant is hereby sponsored and will be permitted to attend the course, if selected.

Date:

Signature with Seal

Sponsoring Authority
 (Principal / Director/ HoD)

Tentative Schedule for Short Term Course
on
“Application of Machine and Deep Learning in Engineering Problems”
09th -13th April, 2020

Date\Time	09:30-11:00		11:00 - 11:30	11:30-13:00	13:00 - 14:00	14:00-15:30	15:30 - 15:45	15:45-17:15
Thursday (09/04/2020)	09:30-10:00	10:00-11:00	Tea Break	Lecture-1 (Prof. Rajeev Kumar, JNU, New-Delhi) Introduction to Machine and Deep Learning	Lunch Break	Lecture-2 (Prof. Rajeev Kumar, JNU, New-Delhi) Linear Regression, Classification	Tea Break	Lecture-3 (Dr. O. P Verma, NIT Jalandhar) Hands On (Preliminary) - Basics of Python and some programming tips
	Registration at IT park	Inauguration Speech (Prof. L. K. Awasthi, Director-NITJ)		Lecture-5 (Prof. T. V. Vijay Kumar, JNU, New-Delhi) Introduction to Learning Algorithm and CSP		Lecture-6 (Prof. S. Balasundaram, JNU, New-Delhi) Decision Tree		Lecture-7 (Prof. S. Balasundaram, JNU, New-Delhi) Support Vector Machine
Friday (10/04/2020)	Lecture-4 (Prof. T. V. Vijay Kumar, JNU, New-Delhi) Introduction to soft computing and AI			Lecture-9 (Dr. Manoj Ramteke, IIT Delhi) Multiobjective optimization, Scheduling and planning		Lecture-10 (Dr. Dileep A. D., IIT Mandi) Convolutional Neural Networks		Lecture-11 (Dr. Dileep A. D., IIT Mandi) Hands on Experience -I
Saturday (11/04/2020)	Lecture-8 (Dr. Manoj Ramteke, IIT Delhi) Novel meta-heuristic algorithms, machine learning and advance computing			Lecture-13 (Dr. Arnav Bhavsar, IIT Mandi) Hands on Experience –II		Lecture-14 (Dr. Partha P. Roy, IIT Roorkee) Deep Learning Networks and Introduction to Tensor Flow		Lecture-15 (Dr. Partha P. Roy, IIT Roorkee) Hands on Experience -III
Sunday (12/04/2020)	Lecture-12 (Dr. Arnav Bhavsar, IIT Mandi) Image Processing with Opencv			Lecture-17 (Prof. Durga Toshniwal, IIT Roorkee) Machine Learning Model Optimization-II		Lecture-18 (Dr. O. P Verma, NIT Jalandhar) Implementation of Meta- heuristic Algorithm to Real Time Optimization problem-I		Lecture-19 (Dr. O. P Verma, NIT Jalandhar) Implementation of Meta-heuristic Algorithm to Real Time Optimization problem-II
Monday (13/04/2020)	Lecture-16 (Prof. Durga Toshniwal, IIT Roorkee) Machine Learning Model Optimization-I							Valediction Ceremony