

One-Week Faculty Development Program On Deep Learning and Machine Learning Applications in Computer Vision

Under the banner of
Electronics and ICT Academy at National Institute of Technology, Patna
and
Coordinated by
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur
&
National Institute of Technology, Patna
22nd August to 28th August, 2020



Chief-Patron

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Vice Chancellor, GGV, Bilaspur

Prof. P.K. Jain
Director, NIT, Patna

Patron

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Coordinators

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Co-coordinators

Dr. Manish Shrivastava, GGV, Bilaspur

Organized by

Department of Computer Science & Engineering, SoS (E&T), Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, C.G., India

&

Electronics and ICT Academy, National Institute of Technology Patna, India.

Supported by

Ministry of Electronics and Information Technology, MeitY, Govt. of India.

About GGV Bilaspur

Guru Ghasidas Vishwavidyalaya, is a Central University of India, located in Bilaspur C.G. State, established under Central Universities Act 2009, No. 25 of 2009. Formerly called Guru Ghasidas University (GGU), established by an Act of the State Legislative Assembly, was formally inaugurated on June 16, 1983. GGU is an active member of the Association of Indian Universities and Association of Commonwealth Universities. Situated in a socially and economically challenged area, the university is appropriately named to honor the great Satnami Saint Guru Ghasidas (born in 17th century), who championed the cause of the downtrodden and waged a relentless struggle against all forms of social evils and injustice prevailing in the society. The University is a residential cum affiliating institution, having its jurisdiction spread over Bilaspur Revenue Division of the state of Chhattisgarh.

About NIT Patna

National Institute of Technology, Patna is the 18th National Institute of Technology created by the Ministry of H.R.D. Government of India after rechristening the erstwhile Bihar College of Engineering Patna on 28.01.2004. The Institute is situated on the south bank of holy river Ganges behind Gandhi Ghat (where the ash of father of the Nation, Mahatma Gandhi was offered in the river Ganges). The Institute imparts high level education training, research and development in science, engineering technology and humanities along with high quality education and values at UG, PG and Ph.D. level. At present, the Institute offers courses in six major technical disciplines viz. Architecture, Civil Engineering, Computer Science & Engg., Electrical Engg., Electronics & Communication Engg. and Mechanical

Engg. It also consists of well-established departments of Physics, Chemistry, Mathematics and Humanities and Social Sciences.

Electronics and ICT Academy

Ministry of Electronics and Information Technology, Government of India has instituted seven Electronics and Information & Communications Technology (ICT) Academies of which, the academy of NIT Patna is one. The Academy at NIT Patna aims to design and organize basic as well as specialized training programmes in niche areas of electronics and ICT for the development of required knowledge base, skills and tools to equip the teaching community with better knowledge and understanding.

Objective of the Program

Deep learning is a subset of machine learning in artificial intelligence (AI) that has networks capable of learning unsupervised/supervised from data that is unstructured or unlabelled. It imitates the workings of the human brain in processing data and creating patterns for use in decision making. Deep learning is achieving state-of-the-art results across a range of difficult problem domains like self-driving cars, Healthcare, computer vision, Automatic Machine Translation, and Finance, etc.

- The proposed FDP provides an opportunity to discuss and address the experimental, theoretical work and methods in solving problems.
- How Machine Learning and Deep Learning Works
- How to apply Machine Learning and Deep Learning Tools and Techniques to solve the problems
- Exchange and cross-fertilize their ideas, in the fields of Deep Learning and Machine Learning.
- Working in soft computing, machine learning, deep learning and artificial intelligence.
- Hands on training on Machine Learning and Deep Learning tools and techniques are to be applied for different application

Topics to be covered

- Overview of Machine Learning Techniques
- Supervised Vs Unsupervised Learning
- Linear Regression, Decision Trees, KNN, Random Forests
- Bayesian Networks, SVM
- Clustering :K Means, C-Means, Agglomerative Clustering
- Machine Learning Application in Computer Vision (Example: Video Surveillance and Medical Imaging)
- Introduction to Deep Learning, Neuron, Threshold Logic, Perceptron Learning Algorithms
- Deep Learning, CNN, 3D-CNN, Googlenet and RNN
- Convolution Neural Network with Medical Image database
- Medical image analysis using Deep Learning in MATLAB /Python
- Object Tracking and Multi-view activity recognition using Deep Learning in MATLAB /Python
- Deep Learning applications in Text Classifications using MATLAB /Python
- Hands-on Session using Python (sklearn, Tensorflow, Keras etc) / MATLAB.

Resource Persons

Internationally acclaimed faculty members from premier institutions like IIT, NIT and Central Universities.

One-week FDP includes

One week Training will be taken by one Industrial Expert with the experience of 6-8 years in the industry and has delivered more than 1000+ sessions in India and abroad. The training hour is 5-6 hours/ each day. Mode of training is Instructor-led live online

- 40 Hours Instructor-led live online Hands-on based learning & Interactive Query Session.
- Soft copy of study material, Training PPT's & Projects code
- Participants will get recorded sessions after completion of training.

Who Can Participate

Faculty members of UGC/AICTE recognized Universities and Engineering colleges all over India, Research scholars (PhD only), students and Industry personals, however priority will be given to the faculty members.

Registration Fee

- **Faculty/ Research Scholar (PhD): Rs. 500/**
- **Students: Rs. 500/-,**
- **Industry and others: Rs. 1000/-**

Registration Process

1. Registration fee will be paid through online mode, the account details for this purpose is

Account Name: NIT Patna
Account No.: 50380476798
IFSC Code: ALLA0212286

2. Link for registration:
<https://tinyurl.com/yyrnsv8g>
3. The brochure of the program may be downloaded from the Institute website
<http://www.nitp.ac.in/ict/>
4. Only Online registration will be accepted and Last date of registration: 21.08.2020 (till 14.00 PM)
5. Before making the (online) payment, please check the availability of link for Registration and after making the payment; complete the registration process as soon as possible.

Total -100 seats and the selection will be done on first-cum-first-serve basis. PDF file of online filled registration form with proof of registration fee paid will be sent through email to **Dr. Alok Kumar Singh (E-mail: ggvfdp@gmail.com)**

Faculty Development Program

on

Deep Learning and Machine Learning Applications in Computer Vision

22nd to 28th, August, 2020

REGISTRATION FORM

1. Name (block letter):
2. Gender:
3. Caste:.....
4. DOB:.....
5. Designation
6. Organization:
7. Address for communication:
-
-
- Pin code: Ph. No.:
- E-mail:
8. Highest Academic Qualification:
9. Specialization:
10. Experience (in years):
(a) Teaching: (b) Industrial:
11. Aadhar No:.....

DECLARATION

I do hereby agree to abide by the rules and regulations of the FDP.

Place:

Date:.....

.....
Signature of the Applicant

Expected Schedule: Plan for each day

	10:00 AM to 12:00 PM	12:00 PM to 01:00 PM	01:00 PM to 02:00 PM	02:00 PM to 05:00 PM
22-08-2020	Overview of Machine Learning Techniques, Supervised Vs Unsupervised Learning	Regression- Linear regression, Polynomial regression, Linear Regression	L U N C H	LAB EXPERIMENT (Introduction to Google Colab and ML using Python)
(Saturday)	(Dr. Ashish Khare)	(Dr. Ashish Khare)		(Dr. Chandramani Sharma)
23-08-2020	Decision Trees, KNN	Principal Component Analysis (PCA),		LAB EXPERIMENT (Decision Trees, KNN and Other Classifiers, K-Fold Validation, Performance Metrics)
(Sunday)	(Dr. Ashish Khare)	(Dr. Ashish Khare)		(Dr. Chandramani Sharma)
24-08-2020	Bayesian Networks, SVM	Clustering: K Means		LAB EXPERIMENT (Bayesian Networks, SVM)
(Monday)	(Prof. Rajeev Srivastava)	(Prof. Rajeev Srivastava)		(Mr. Rajat Khurana)
25-08-2020	AIML Applications in Rural Development and Agriculture	Threshold Logic, Perceptron Learning Algorithms		LAB EXPERIMENT (Clustering :K Means)
(Tuesday)	(Mr. Kapil Tomar)	(Dr. Om Prakash)		(Dr. Chandramani Sharma)
26-08-2020	Machine Learning Application in Computer Vision (Example: Video Surveillance and Medical Imaging)	Image and Video Segmentation and Classification		LAB EXPERIMENT (Tensorflow 2.0 and Keras DL, Layers, Optimizers, Losses, Compile and Fit the Models)
(Wednesday)	(Dr. Ashish Khare)	(Mr. Rajat Khurana)		(Dr. Chandramani Sharma)
27-08-2020	Deep Learning, CNN	Convolution Neural Network with Medical Image database		Some Interesting Use Cases for Deep Learning
(Thursday)	(Mr. Neeraj Varshney)	(Dr. Abhishek Singh)		(Dr. Vibhav Singh)
28-08-2020	Object Tracking and Multi-view activity recognition for Intelligent Video Surveillance	LAB EXPERIMENT (Human Object Tracking and Activity recognition using DL in Python)		RNN, LSTM,,
(Friday)	(Dr. Manish Khare)	(Mr. Rajat Khurana)		(Dr. Chandramani Sharma)
Total Hour	14	7	1	18

Total Theory Hours: 24 Hours
 Total Practical: 16 Hours
Total FDP Hours: 40 Hours