Indira Gandhi Delhi Technical University for Women

Centre of Excellence – AI

(Supported by Department of Science and Technology (DST), GOI)

&

Department of AI and Data Sciences and AI Club

Six Weeks Online Internship Program

On

Computer Vision and Deep Learning

(Blended Mode)

(6th June, 2022 to 18th July, 2022)

Patron
Dr (Mrs.) Amita Dev
Hon'ble Vice Chancellor, IGDTUW

Coordinator
Prof. Arun Sharma
Head – Dept. of AI and Data Sciences

Introduction:

Indira Gandhi Delhi Technical University for Women (IGDTUW) has been upgraded from Indira Gandhi Institute of Technology in May 2013 vide Delhi State Legislature Act 9, 2012, as a non-affiliating teaching and research University at Delhi to facilitate and promote studies, research, technology, innovation, incubation and extension work in emerging areas of professional education among women, with focus on engineering, technology, applied sciences, management and its allied areas with the objective to achieve excellence in these and related fields

Centre of Excellence (CoE) in Artificial Intelligence (AI) at IGDTUW, established by the support of Department of Science and Technology (DST), GOI caters to the requirements of Under-graduate, Post-graduate and Doctorate programs in the domains of AI, Machine Learning and Deep Learning and various applications including Robotics, Drones, NLP and others. The centre serves as the perfect platform with necessary hardware and software infrastructure to serve as a playground to the creative minds that solve real data driven problems at hand.

The Department of Artificial Intelligence and Data Science (AI&DS) in the university aims to focus on a four-tiered strategy of Education, Research, Development and Innovation (ERDI Strategy) in the field of AI, Machine Learning, Deep Learning and Data Sciences. Currently the department is running a 4 years UG program B.Tech – CSE(AI), which is specially designed to enable students to build intelligent machines, software, or applications with a cutting-edge combination of machine learning, analytics and visualization technologies.

The AI Club is a technical society with the goal of spreading awareness and knowledge on topics like machine learning, deep learning and robotics. We organize hackathons, international conferences, trainings, mentorships etc. in collaboration with reputed multinational companies like Deloitte, Incubate IND, Amazon, Urban Company, Coding Blocks among many others.

Objectives of Internship:

This internship aims to provide a concise introduction to the fundamental concepts in machine learning including mathematical foundations, programming tools and packages and popular machine learning and deep learning algorithms. The participants will gain knowledge in Machine Learning principles through a lot of practical applications covering industrial case walk-through and real-time applications.

Eligibility: UG, PG students and PhD Research Scholars

Course Fee: INR 2000/- for IGDTUW students and INR 3000/- for others

Batch size: 50

Resource Persons: Industry Professionals (IBM, Amazon, American Express and others), Academicians and Researchers

Internship project/ Research Paper:

During the internship students are required to make a project with the team members of maximum three participants. At the end of the internship, a project competition will be organized for demonstrating the projects. Innovative Projects may also get a chance for seed funding and mentorship for further development and commercialization/patent of their project from Anveshan Foundation. The projects with research flavour will be guided by the Faculty Mentors for writing a Research paper. University will support the Registration Fee (upto Rs. 5000/-) for presenting the Paper in the Conference. If a paper is accepted for SCOPUS Journal, students will also get a Cash reward.

At the end of the Internship, participants will get an Internship Certificate.

Internship Scheme: Internship has two components as mentioned below -

Components	Dates
Online Sessions (Theory and Lab)	6th June – 4th July, 2022
Project Work	5th July – 18th July , 2022

Important Dates

Last date to apply	:	4th June, 2022
Internship Dates	:	6th June, 2022 - 18th July, 2022
Duration of online sessions	:	6th June – 18th July, 2022
Duration provided for project report	:	5th July – 17th July, 2022
Demo Day	:	18th July, 2022

Registration Link: https://forms.gle/zPHcqwqg6NfNUq9DA

Bank's details for fee payment

Particulars	Details
Name & Address of the Beneficiary	Registrar, IGDTUW
Account Number of the Beneficiary	09001000018949
Name & Address of the Bank Branch	Punjab & Sind Bank, GGSIP University, Kashmere Gate, Delhi - 110006
Fee (Amount to be transferred)	Rs. 2000/- for IGDTUW students and Rs. 3000/- for outside IGDTUW students
IFSC Code	PSIB0001098

For any further inquiry, please contact: **Dr. Ritu Rani (**Research Associate , COE - AI)
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Major Contents of the Session

UNIT I - Computer Vision

Introduction to Computer Vision, Working with Images and Videos, Image Transformation, Image classification, Image segmentation, Video Transformation, Concepts of Deep Learning ,Introduction and working with deep learning frameworks Tensorflow, Keras Implementation of hands-on projects:

- Project 1: Face, Eye, Smile Detection using OpenCV Face Recognition using OpenCV & K-Nearest Neighbours Algorithm Classification
- Project 2: Facial Expression / Emotion Detection using Deep Learning (CNN)
- Project 3: Face Mask Detection and Classification using Deep Learning CNN and OpenCV for real time
- Project 4: Object Detection using Computer Vision and Deep Learning
- Project 5: Traffic Sign Image Classification for Self-Driving Car
- Project 6: Social Distancing Detector using Computer Vision and Deep Learning API Keras
- Project 7: Brain MRI Medical Image Segmentation using U-Net
- Project 8: Human pose estimation using Deep Learning in OpenCV

UNIT – II Deep Learning

This section will give practical hands-on experience of Deep Learning using Keras/TensorFlow and PyTorch with appropriate case studies. Introductory Deep Learning: A Single Neuron, Deep Neural Networks, Stochastic Gradient Descent, Overfitting and Underfitting, Dropout and Batch Normalization, Binary Classification
Convolutional Neural Network: The Convolution Classifier, Convolution and ReLU, Maximum Pooling, The Sliding Windows, Custom Convnets, Data Augmentation
Recurrent Neural Networks LSTM/GRU: Recurrent Neural Networks (RNN), Long Short Term Memory (LSTM), Gated Recurrent Units (GRU), Time Series Data Classification, Sequence to Sequence Learning.

PROJECT WORK