

Indian Workshop on Applied Deep Learning (IWADL)

December 15 to 18, 2019

Department of CSIS, BITS Pilani, Pilani, Rajasthan



ABOUT THE WORKSHOP

Department of CSIS, BITS Pilani (an institute of Eminence) proudly announce Indian Workshop on Applied Deep Learning (IWADL-2019) at BITS Pilani, Pilani Campus, Rajasthan. The workshop targets motivated professional, scholars at undergraduate/master/PhD level and faculty members who want to pursue work in the area of advanced machine learning. Workshop conducts intense lectures and hands-on sessions on both basic and advanced topics. This workshop aims to give exposure to recent advances in the area of deep learning to the participants.

OBJECTIVE & SCOPE



Due to the recent drift of technology and enhanced computation power (using GPU's) a new paradigm of deep learning based architectures got extensively explored. These architectures have been exploited by all communities to solve almost all types of computer vision as well as image processing problems.

Algorithms have to be implemented over GPU enabled systems, so as to be optimized over very high dimensional parametric space. Recently, in all top-tier conferences like CVPR, ECCV, ICCV, NIPS, ICLR huge amount of work has been presented to exploit the power of CNN, RNN, Autoencoders, GANS and other related deep learning architecture to solve problem in the domain of Computer Vision, Image Processing, Speech Processing, NLP etc. This is a practical oriented workshop which covers extensive hands-on sessions on Deep Learning.

BITS PILANI

(Birla Institute of Technology & Science, Pilani)



BITS PILANI is a multi-campus deemed university with campuses in Pilani , Goa, Hyderabad in India and in Dubai, UAE. BITS Pilani is known for its flexible and modular academic curriculum with strong emphasis on University-Industry linkages. The Mathematics department was established in 1944 as a part of the, then existing Birla Science College, which was incorporated in the BITS Pilani in 1964. The department offers opportunities for the education and research in a wide spectrum of areas in Mathematics such as: Algebra and Analysis, Differential Equations and their applications, Discrete Mathematics, Statistics, Operations Research, Mathematical Modeling, Fluid Dynamics, Fuzzy Logic, Fractional Calculus, Cosmology etc.

Birla Institute of Technology & Science, Pilani (BITS Pilani) is a private not-for-profit institute of higher education and research in India. It is a deemed university under Section 3 of the UGC Act 1956. The institute is one of the first six institutes to be awarded the Institute of Eminence status in 2018.

BITS, Pilani has strongly shape the Indian economy and culture. Through its highly successful and widespread alumni network spanning globally across varied fields, BITS Pilani has made a significant impact on corporates, academia, research, entrepreneurship, arts and social activism.

SPONSORS

DRDO

(Defence Research & Development Organisation)



DRDO is the R&D wing of Ministry of Defence, Govt of India, with a vision to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems, while equipping our armed forces with state-of-the-art weapon systems and equipment in accordance with requirements laid down by the three Services. DRDO's pursuit of self-reliance and successful indigenous development and production of strategic systems and platforms such as **Agni** and **Prithvi** series of missiles; **Light combat aircraft, Tejas**; multi-barrel rocket launcher, **Pinaka**; air defence system, **Akash**; a wide range of radars and electronic warfare systems; etc., have given quantum jump to India's military might, generating effective deterrence and providing crucial leverage. "*Balasya Mulam Vigyanam*" - the source of strength is science-drives the nation in peace and war.

DRDO was formed in 1958, was a small organisation with **10** establishments or laboratories. Over the years, it has grown multi-directionally in terms of the variety of subject disciplines, number of laboratories, achievements and stature.

Today, DRDO is a network of more than **50** laboratories which are deeply engaged in developing defence technologies covering various disciplines. Several major projects for the development of missiles, armaments, light combat aircrafts, radars, electronic warfare systems etc are on hand and significant achievements have already been made in several such technologies.

NSDC

(National Skill Development Corporation)



The National Skill Development Corporation India (NSDC) was setup as a one of its kind, Public Private Partnership Company with the primary mandate of catalysing the skills landscape in India.

NSDC is a unique model created with a well thought through underlying philosophy based on the following pillars:

1. **Create:** Proactively catalyse creation of large, quality vocational training institutions.
2. **Fund:** Reduce risk by providing patient capital. Including grants and equity.
3. **Enable:** the creation and sustainability of support systems required for skill development. This includes the Industry led Sector Skill Councils.

NSDC has achieved great milestones like:

- Over **5.2 million** students trained.
- **235** private sector partnerships for training and capacity building, each to train at least **50,000** persons over a 10-year period along with **38** Sector Skill Councils (SSC).
- **1,386** Qualification Packs with **6,744** unique National Occupational Standards (NOS). These have been validated by over **1000** companies.
- Vocational training introduced in **10** States, covering **2400+** schools, **2** Boards, benefitting over **2.5 lakh** students. Skill Development Management System (SDMS) with **1400** training partners, **28179** training centres, **16479** trainers, **20** Job portals, **77** assessment agencies and **4983** empanelled assessors.

SKILL INDIA

(Skill Development & Management Program)



A comprehensive program to train and develop industrial, entrepreneurial skills among Indians was launched by Prime Minister Narendra Modi on **July 15, 2015**. The program is called **Skill India Mission**.

Skill India Mission aims to:

- Encourage standardization in the certification process and initiate a process of creating a registry of skills.
- Increase productivity of the existing workforce and align the training and certification to the needs of the country.
- Provide cash rewards for skill certification to boost employability and productivity of youth by incentivizing them for skill trainings.
- Reward candidates undergoing skill training by authorized institutions at an average monetary reward of **Rs. 10,000 per student**.
- To benefit one million youth at an approximate total cost of **Rs.10 billion**.

India's Ministry of Finance has launched the National Skills Certification and Monetary Rewards Scheme as part of Skill India. The objective of this scheme is to encourage skill development for youth by providing monetary rewards for successful completion of approved training programs.

Skill India aims at tapping this vast potential of indigenous manpower. For over seven decades since India's independence, no such initiatives were taken to tap the potential of the country's workforce.

WILEY

(John Wiley & Sons, Inc.)

WILEY

Wiley empowers researchers, learners, universities, and corporations to achieve their goals in an ever-changing world. For over 200 years, they have been helping people and organizations develop the skills and knowledge they need to succeed. They develop digital education, learning, assessment, and certification solutions to help universities, businesses, and individuals move between education and employment and achieve their ambitions. By partnering with learned societies, they support researchers to communicate discoveries that make a difference. Their online scientific, technical, medical, and scholarly journals, books, and other digital content build on a 200-year heritage of quality publishing.

WILEY's mission has always focused on helping it's customers succeed, wherever they are in their education and professional careers by bridging the higher education gap by delivering content solutions in new and innovative ways to enrich the learning experience. It is a proven leader in strategic higher education consulting and partnering with educators and institutions globally to achieve success, and the print and digital solutions enable students and instructors worldwide. It encourages learning to be a continuous, lifelong experience – an integral, essential part of every stage of building a career.

Wiley close the talent deficit by supporting employers, helping them find and retain top talent, assess their employees' skill sets, and implement training in order to transform company cultures. For decades we've helped people learn; today we're showing them new ways to achieve, get certified and advance their careers.

PATRONS



Prof. Souvik Bhattacharyya(Chief Patron)
Vice Chancellor, BITS Pilani

He is a Fellow of the Indian National Academy of Engineering (INAE) & National Academy of Science, India (NASI) & is the first recipient of the Outstanding Teacher Award of Indian National Academy of Engineering.



Prof. Ashoke Kumar Sarkar(Patron)
Director, BITS Pilani, Pilani Campus

Ph.D. (Civil Engineering), Indian Institute of Technology, Kharagpur, 1992. He has handled more than 20 Research & consultancy Projects.



Prof. Poonam Goyal(Patron)
HOD CSIS, BITS Pilani, Pilani Campus

Ph.D. (1995) in Numerical Analysis (Applied Mathematics): Department of Mathematics, IIT, Roorkee. Her current areas of research include Data Mining, Text Mining, Information Retrieval, Multimedia Retrieval, Data Structures and Algorithms and High Performance Computing in more than 40 publications.

LEAD SPEAKERS



Prof. Santanu Chaudhury
Director, IIT Jodhpur



Prof. Chetan Arora
IIT Delhi



Dr. Aditya Nigam
IIT Mandi



Prof. Rahul Banerjee
Director, LNMIIT Jaipur



Dr. Lovelyn Rose
Author Deep Learning using Python, PSGCT, Coimbatore



Prof. Navneet Goyal
BITS Pilani, Pilani Campus



Prof. Chandrashekar
BITS Pilani, Pilani Campus



Dr. Ashutosh Bhatia
BITS Pilani, Pilani Campus



Prof. A. P. Singh
BITS Pilani, Pilani Campus



Prof. B. K. Rout
BITS Pilani, Pilani Campus



Mr. Deepak Vishwakarma
DRDO



Dr. Kamlesh Tiwari
BITS Pilani, Pilani Campus

DAY 1

SUNDAY, DECEMBER 15, 2019

AGENDA:

| | |
|-------------------------|---|
| 09:00 - 09:40 AM | Registration & Inauguration |
| 09:40 - 10:00 AM | HIGH TEA |
| 10:00 - 11:00 AM | Keynote Talk (skype) - (<i>Prof. Santanu Chaudury</i>) |
| 11:00 - 12:00 AM | Computer Vision & Deep Learning (<i>Prof. Chetan Arora</i>) |
| 12:00 - 12:10 AM | TEA BREAK |
| 12:10 - 01:10 PM | Trends in Egocentric - Vision (<i>Prof. Chetan Arora</i>) |
| 01:10 - 02:00 PM | LUNCH |
| 02:00 - 03:15 PM | Basics of Machine Learning (<i>Dr. Kamlesh Tiwari</i>) |
| 03:15 - 03:30 PM | TEA BREAK |
| 03:30 - 04:45 PM | Perceptron(<i>Dr. S. Lovelyn Rose</i>) |
| 04:45 - 06:00 PM | Lab 01: Introduction to Keras & Fully Connected Networks |

HIGHLIGHTS



DAY 2

MONDAY, DECEMBER 16, 2019

AGENDA:

| | |
|-------------------------|--|
| 09:00 - 10:00 AM | Clustering and Discriminant Functions (<i>Prof. B.K. Rout</i>) |
| 10:00 - 11:30 AM | Training, Regularization, FC Networks, Backpropagation (<i>Dr. S. Lovelyn Rose</i>) |
| 11:30 - 11:40 AM | TEA BREAK |
| 11:40 - 01:10 PM | Convolutional Neural Networks (CNN) (<i>Dr. Kamlesh Tiwari</i>) |
| 01:10 - 02:00 PM | LUNCH |
| 02:00 - 03:45 PM | CNN- Case Studies (Models & Comparisons) (<i>Dr. Aditya Nigam</i>) |
| 03:45 - 04:00 PM | TEA BREAK |
| 04:00 - 06:00 PM | Lab 02: Convolutional Neural Networks (CNN) |

HIGHLIGHTS





DAY 3

TUESDAY, DECEMBER 17, 2019

AGENDA:

| | |
|-------------------------|---|
| 09:00 - 09:45 AM | Expert Talk (<i>NSDC</i>) |
| 09:45 - 10:30 AM | Expert Talk (<i>Prof. Navneet Goel</i>) |
| 10:30 - 11:30 AM | Object Detection & Localization (<i>Dr. Aditya Nigam</i>) |
| 11:30 - 11:40 AM | TEA BREAK |
| 11:40 - 01:10 PM | RNN & LSTM (<i>Dr. Kamlesh Tiwari</i>) |
| 01:10 - 02:00 PM | LUNCH |
| 02:00 - 03:30 PM | Autoencoders & VAE (<i>Dr. Aditya Nigam</i>) |
| 03:30 - 03:45 PM | TEA BREAK |
| 03:45 - 06:00 PM | Lab 03: RNN & LSTM, Autoencoders |

HIGHLIGHTS





DAY 4

WEDNESDAY, DECEMBER 18, 2019

AGENDA:

| | |
|-------------------------|---|
| 09:00 - 09:45 AM | Security & Deep Learning (<i>Dr. Ashutosh Bhatia</i>) |
| 09:45 - 10:30 AM | Applications and Case Studies (<i>Prof. A.P. Singh</i>) |
| 10:30 - 11:30 AM | Siamese Networks (<i>Geetika Arora/Daksh Thapar</i>) |
| 11:30 - 11:40 AM | TEA BREAK |
| 11:40 - 01:10 PM | Generative Adversarial Networks (GAN) (<i>Dr. Aditya Nigam</i>) |
| 01:10 - 02:00 PM | LUNCH |
| 02:00 - 03:00 PM | Panel Discussion (<i>NSDC, Prof. Chandrashekhar, Mr. Deepak Vishwakarma, Prof. A.P. Singh, Prof. Navneet Goel</i>) |
| 03:00 - 03:15 PM | TEA BREAK |
| 03:15 - 04:00 PM | Valedictory Session |
| 04:00 - 06:00 PM | Lab 04: VAE and GAN |

HIGHLIGHTS







FEEDBACKS

- ★ *"An unforgettable experience!"*
- ★ *"A workshop by team of intellectuals. Superb!"*
- ★ *"5 Days of Deep Dive into Deep Learning, its mathematics , LSTM & CNN were amazing. I would remember AUTOENCODER@prashar throughout my life."*
- ★ *"Extremely thankful for such wonderful workshop."*
- ★ *"Good, Great, for everything that was at the workshop, be it a team, the content, logistics etc. Keep on organizing such events & programs. Good Luck!"*
- ★ *"Excellent Workshop"*
- ★ *"Such a wonderful workshop it was!! The speaker explained every concept starting from zero level to in-dept."*
- ★ *"It reminded me the experience of the book 'The Monk who sold his ferrari'."*
- ★ *"Amazing workshop. Thank you for making beautiful memories."*
- ★ *"You have created a community of intellectuals here & I feel blessed to be a part of it."*
- ★ *"Amazing Workshop (Practical-oriented)"*
- ★ *"I got the eye to visualize how information flowing in terms of matrix & numbers from this workshop. Most valuable 5 days for me. "*
- ★ *"Thank you so much team IWADL for opening our minds & eyes to the world of deep learning. "*
- ★ *"Awesome Workshop."*
- ★ *"Excellent way of teaching. Management os definitely is the backbone of this workshop"*
- ★ *"Enjoyed alot. Learned a lot. Thanks for eveything!"*