Deep Learning
(CS 590)
3 – 0 – 0 – 6
July - November 2023

Time: G Slot (Wednesday, Thursday and Friday) 12.00 – 1.00 PM
Room: Lecture Hall 2 (L2)

Arijit Sur

Multimedia Lab
Department of Computer Science and Engineering
IIT Guwahati

Syllabus

- Module I: ML Basics: Fundamentals, Neural Network: SLP, MLP, Back Propagation, Over-fitting, Regularization.

- Module II: Deep Networks (Definition, Motivation, Applications), CNN (Basic architecture, activation function, pooling, handling vanishing gradient problem, Dropout, Greedy Layer-wise Pre-training, Better weight initialization methods, Batch Normalization), Different CNN Models (Alex Net, VGG Net, Google Net, Res Net, Dense Net), Sequence Learning (1D CNN, RNN, Gated RNN, LSTM), Generative Modelling (GAN), Zero Shot Learning, Reinforcement learning

- Module III: Research Applications: Computer Vision, Robotics etc.

TA Members

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Books

- **Text Books:**
  - Neural Networks and Learning Machines, 3rd edition, Simon Haykin, Pearson Prentice Hall.
  - Link: https://www.dai.fmph.uniba.sk/courses/NN/haykin.neural-networks.3ed.2009.pdf
  - Deep Learning: By Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press, 2016
    Link: https://www.deeplearningbook.org/
- **Reference Books**:
  - Deep Learning for Computer Vision By Shanmugamani Rajalingappaa, Packt Publishing Limited
  - Deep Learning with Tensor Flow By Zaccone Giancarlo, Packt Publishing Limited

Evaluation and Grade

- Evaluation and Grade:
  - MID SEM (Tentative weightage = 30)
  - END SEM (Tentative weightage = 50)
  - 2 Quiz's (Tentative weightage = 10 + 10)

Best Wishes