Deep Learning
(CS 590)
3 – 0 – 0 – 6
September - November 2020

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, Applications for Computer Vision.

- **Module III:** Application for NLP: Data Embedding;

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

- Percentage of Grade : Continuous Evaluation throughout the semester

- Date of Test: TBA (Hints: Mostly Saturday Slots)

- Four Tests (Tentative)
  - Online Mode
  - Probably short answer type questions (Tentative)

Online Platform

- MS Teams

- Google Meet (alternative choice)
  - All registered students are asked to submit their Gmail address and Phone no. in the given google sheet.

- Online attendance

Grades

- TBA

Best Wishes