



Deep Learning

CS60010

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<http://cse.iitkgp.ac.in/~adas/>



Logistics

- **Course Name and code:** Deep Learning, CS60010
- **Time:** Wednesday (11:00am-11:55am), Thursday (12:00-12:55 pm), Friday (8:00-9:55 am)
- **Venue:** Online using Zoom
- **Course website:**
http://cse.iitkgp.ac.in/~adas/courses/dl_spr2022/dl_spr2022.php



Logistics

- **Moodle Classroom:** <https://kgpmoodle.iitkgp.ac.in/moodle> and then the class name is – Deep Learning (CS60010) - Spring 2022
- **Piazza Forum:** <https://piazza.com/iitkgp.ac.in/spring2022/cs60010/home>
- **TAs:** Aadarsh Sahoo (sahoo_aadarsh@iitkgp.ac.in), Siddhant Agarwal (agarwalsiddhant10@iitkgp.ac.in), Anurag Roy (anurag_roy@iitkgp.ac.in), Md. Laadla (mailzayaan1493.ml@kgpian.iitkgp.ac.in), Deepak Mewada (deepakmewada96@kgpian.iitkgp.ac.in)

The Team

Instructor



Abir Das

Teaching Assistants



Aadarsh Sahoo



Anurag Roy



Md. Laadla



Siddhant
Agarwal



Deepak
Mewada

• **And YOU!!**



Course Information

- **Prerequisites:** 1. CS60050: Machine Learning
- **Python Proficiency:** Proficiency in Python and familiarity with some Deep Learning tools (Tensorflow, Pytorch etc.) is desirable. A few links to get started.
 - <https://docs.python.org/3/tutorial/>
 - <http://cs231n.github.io/python-numpy-tutorial/>



Course Information

- **Books and References:**

1. "Deep Learning", I Goodfellow, Y Bengio and A Courville, 1st Edition, Free [link](#).

- More references specific to the lectures will be added in the course website as and when needed.



Course Information

- Online lectures/Videos: The following courses will be closely followed in this course
 - Convolutional Neural Networks for Visual Recognition from Stanford University ([Link](#))
 - Deep Learning by Efstratios Gavves ([Link](#))
 - NPTEL Deep Learning by Prabir Kumar Biswas ([Link](#))
 - Designing, Visualizing and Understanding Deep Neural Networks from UC Berkeley ([Link](#))



Course Information

- **Evaluation:** ClassTest (60%) – 3; Programing Assignments (30%) - 2; Paper presentation (10%). [**Tentative**]
 - ClassTests and Programing Assignments:
 - They will have a combination of Mathematical and coding problems.



Course Information

- **Evaluation:** ClassTest (60%) – 3; Programing Assignments (30%) - 2; Paper presentation (10%). [**Tentative**]
- Paper presentation
 - The whole class will be divided into 2 member teams. The team will be formed by the instructors and the TAs. Papers will be assigned to each team by the instructors and the TAs.
 - The presentations will be outside class hours [possibly in the evening]. Exact dates will be announced later. The tentative start of paper presentations will be mid of February. The duration of each presentation will be 10 minutes (+ 2 minutes Q&A).
 - Each team will have to present one paper during the whole semester.
 - Some thumb-rules:
 - 10-12 slides in total, divide the presentation in problem definition (if required provide importance of the problem), approach (if you can motivate why the approach is good/novel it will be great), Results and what could have been done extra according to you.



Course Information

- **Evaluation:** ClassTest (60%) – 3; Programing Assignments (30%) - 2; Paper presentation (10%). [**Tentative**]
- Paper presentation – **Why are we doing this?**
 - Deep Learning is a rapidly evolving field. Everyday new papers are coming out. Just check ArXiv and see (especially just after the paper submission deadlines of reputed conferences. We will see what are some good conferences in fields related to Deep Learning in a few slides).
 - Some of them are good, some are bad. If we divide and conquer the task of reading papers everybody will be benefitted.
 - Papers are BIIIIIG things. How do I get started?
 - Fantastic tips by Andrew Ng. [[Link](#)] (First 30 minutes)



Course Information

- **Tentative syllabus and schedule:** A tentative schedule is posted in the website - http://cse.iitkgp.ac.in/~adas/courses/dl_spr2022/syllabus.html

Module	Event Type	Date	Description	Course Materials	Videos
Module 01	Lecture 1	Wednesday Jan 05	Introduction Course logistics and overview.	[slides (pptx)]	[Link]
	Lecture 2	Thursday Jan 06	Linear Algebra Primer, Vector Calculus Review Brief review of concepts from Linear Algebra and Vector Calculus.	[slides (pptx)]	[Link]
	Lecture 3	Friday Jan 07	Optimization Types of errors, bias-variance trade-off, overfitting-underfitting, brief review of concepts from optimization, variants of gradient descent, momentum based methods.	[slides (coming)]	[Link]
	Lecture 4	Wednesday Jan 12			[Link]
	Lecture 5	Thursday Jan 13			[Link]
Module 02	Lecture 6	Friday Jan 14	Linear and Logistic Regression Basic concepts of Linear and Logistic Regression.	[slides (coming)]	[Link]
	Lecture 7	Wednesday Jan 19			[Link]
Module 03	Lecture 8	Thursday Jan 20	Artificial Neural Networks Basic concepts of artificial neurons, single and multi layer perceptrons, perceptron learning algorithm, its convergence proof, different activation functions, softmax cross entropy loss function.	[slides (coming)]	[Link]
	Lecture 9	Friday Jan 21			[Link]
Class test-I on Module 01 and 02 on Jan 27 (Thursday)					

Jan 05, 2022



What about Computing Resources

- We are encouraging you to use Google Colab.
- Homeworks can be done in your PC and Google Colab (free to use).
- We are planning to arrange tutorial session to get you started on Colab and some basics of python.
- We are also trying for some free GCP credits.



Computer Vision Conferences

- CVPR – Computer Vision and Pattern Recognition, since 1983. Held in USA (2023 is scheduled to be held in Vancouver, first time outside USA)
 - Google Scholar h-5 index, 2022 – 356 (Top 4 across any field, any conference or journal)
- ICCV – International Conference on Computer Vision, since 1987. Held every other year, across the world.
 - Google Scholar h-5 index, 2022 – 184
- ECCV - European Conference on Computer Vision, since 1990. Held every other year, in Europe.
 - Google Scholar h-5 index, 2022 – 197
- Organized under the banner of CVF (Computer Vision Foundation) - [Link](#)



Computer Vision Conferences

- ACCV – Asian Conference on Computer Vision
- BMVC – British Machine Vision Conference
- ICIP - International Conference on Image Processing
- WACV - Workshop on Applications of Computer Vision
- ICPR - International Conference on Pattern Recognition
- ICVGIP – Indian Conference on Computer Vision, Graphics and Image Processing
- NCVPRIPG - National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics



Computer Vision Journals

- PAMI – IEEE Transactions on Pattern Analysis and Machine Intelligence
 - Google Scholar h-5 index, 2022 – 149
 - Impact Factor – 16.389
- TIP - IEEE Transactions on Image Processing
 - Google Scholar h-5 index, 2022 – 123
 - Impact Factor – 9.34
- IJCV - International Journal of Computer Vision
 - Google Scholar h-5 index, 2022 – 72
 - Impact Factor – 7.410



Conferences in Other Application Areas

- NeurIPS – Neural Information Processing Systems
 - Google Scholar h-5 index, 2022 – 245 (12th across any field, any conference or journal)
- MICCAI – Medical Image Computing and Computer-Assisted Intervention
- ICLR – International Conference on Learning Representations
 - Google Scholar h-5 index, 2022 – 253 (10th across any field, any conference or journal, Started in 2013)
- ICML – International Conference on Machine Learning
 - Google Scholar h-5 index, 2022 – 204
- ACL, EMNLP – Conferences in Natural Language Processing.
 - Google Scholar h-5 index, 2022 – 157 [ACL], 132 [EMNLP]
- IJCAI, AAAI, NAACL, FAT-ML, ACM-MM, ICRA



Journals Other Application Areas

- TMM – IEEE Transactions on Multimedia
 - Google Scholar h-5 index, 2022– 78
 - Impact Factor – 6.513
- JMLR - Journal of Machine Learning Research
 - Google Scholar h-5 index, 2022 – 96
 - Impact Factor – 4.091
- KDE- IEEE Transactions on Knowledge and Data Engineering
 - Google Scholar h-5 index, 2022 – 87
 - Impact Factor – 6.977
- TCSVT, CVIU, IJRR

Decide Where to Submit

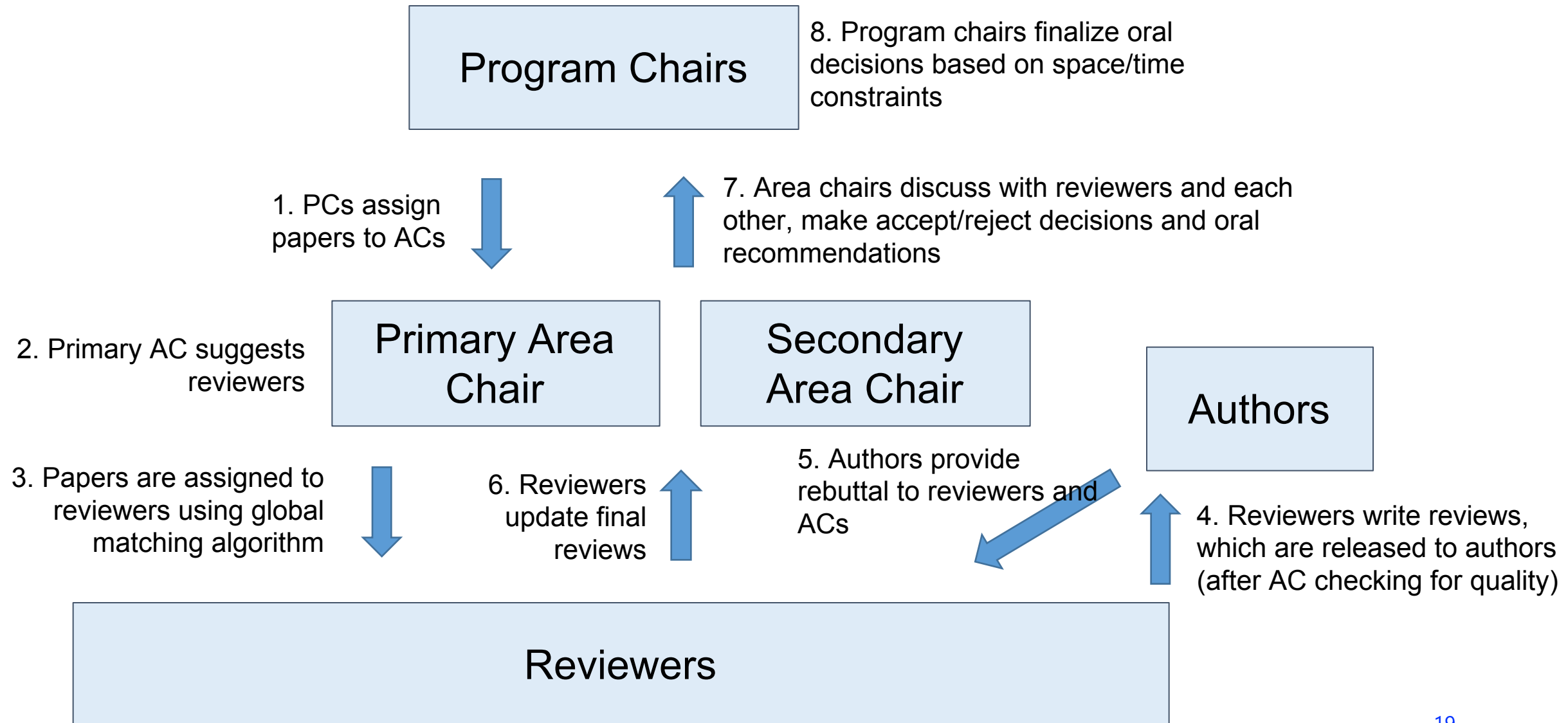


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The Decision Process: Overview



How to Write a Good Paper



- Youtube [Link](#)
Jan 05, 2022



Thank You!!