

Project Number	Project Title	Description	Expectation	Link Of Papers	Additional Links	Broad Area	
1	Facial Emotion Recognition using Min-Max Similarity Classifier	The automatic recognition of facial expressions using image template matching techniques suffer from the natural variability with facial features and recording conditions. Implement an efficient and straightforward facial emotion recognition algorithm to reduce the problem of interclass pixel mismatch during classification	Replicate the results described in the paper. Can you make your model work on photos of you/your friends?	https://arxiv.org/pdf/1801.00451.pdf	https://github.com/anagravw/ml-face-jaffe-dataset	Computer Vision, Pattern Recognition	
2	Using Deep Features of Only Objects to Describe Images	Given an image and the labels of the objects, describe the image in words. The paper proposes how to generate object level image captions using deep learning	Implement and show results on any one/two of the models described in the paper.	https://arxiv.org/pdf/1902.09969.pdf		CV, NLP	
3	Multi-Scale Quasi-RNN for Next Item Recommendation	Normal recommendation systems do not consider sequential information. Implement a system to recommend the next item based on the previous records.	Implement and replicate the results described in the paper.	https://arxiv.org/pdf/1902.09849.pdf		NLP, RNN, Recommender System	
4	Syntactic Recurrent Neural Network for Authorship Attribution	Given a paragraph, predict the authorship based on the writing style. The paper proposes Syntactic RNN model for this task.	Implement and replicate the results described in the paper.	https://arxiv.org/pdf/1902.09723.pdf		NLP, RNN	
5	Improving Recommendations with Collaborative Factors	Building an improved recommender system based on collaborative filtering which better captures the intrinsic features for users and items.	Implement and replicate the results described in the paper.	https://link.springer.com/content/pdf/10.1007/978-3-319-08010-9_4.pdf		Recommender System	
6	Partial Multi-View Outlier Detection Based on Collective Learning	Build a multi-view outlier detection model and test on real data.	Implement and replicate the results described in the paper.	https://aaai.org/ocs/index.php/AAAI/AAAI18/paper/view/17166/15700	http://projects.csail.mit.edu/cmplaces/	Computer Vision, Pattern Recognition	
7	Detect phishing/malicious web pages	a comprehensive survey and a structural understanding of Malicious URL Detection techniques	Students have to come up for some good features to tackle this open challenge	https://arxiv.org/pdf/1701.07179.pdf		NLP/Text	
8	Correlating Text with Emojis	Emojis have gone viral on the Internet across platforms and devices. However, little has been done to analyze the usage of emojis at scale and in depth. Why do some emojis become especially popular while others don't? How are people using them among the words?	1) Analysis of Emojis with words 2) Sentence Sentiment => Emoji Challenge: Given a sentence, it check the sentiment analysis and put emojis in sentence at appropriate location.	https://arxiv.org/pdf/1803.02392.pdf		NLP, Clustering, Analysis	
9	Predicting Movie Ratings based on reviews	predict the star rating (1-5) of a user reviews about a movie	Give an overall rating based on comments Challenge: Come up with category wise rating system: example: Strategy, Suspense, thrillers or other. Team has to come up for approach so that other category can be created from model.	http://aclweb.org/anthology/Y07-1050 http://ai.stanford.edu/~amaas/papers/wvSent_acl2011.pdf		NLP, Information Analysis	Extend to bookmyshow.com
10	Keyphrase Extraction	Clustering to find exemplar terms for keyphrase extraction		http://dl.acm.org/citation.cfm?id=1699544		nlp, ire, unsupervised	
11	Predict movie tagline from text synopsis	Given a plot or summary of movie, Can we predict the tagline for the movie?	Can we extend it over Indian movies?	some reference: https://arxiv.org/pdf/1801.04813.pdf	http://www.impawards.com/taglines/b1.html	NLP	
12	Music Genre Classification from Lyrics	song genres classification like pop, classic Are word choice itself a good predictor of genre or It depends on the way a person sing. Dataset: Marsyas Open source tool	Challenge: Indian Lyrics.	http://cs229.stanford.edu/proj2012/Diekroeger-CanSongLyricsPredictGenre.pdf		K-Means, svm, NN	
13	Music Recommendation by exploiting music play sequence	Explore the effects of music play sequence on developing music recommender system by using word embedding techniques and subsequently boost the latent feature learning and discovery.		https://www.ijcai.org/proceedings/2017/0511.pdf			
14	Dynamic lexicon generation for natural scene images	Dynamically ranking the words that can occur in an image based on image and it's textual description. Go through the paper for details. Dataset available.		http://refbase.cvc.uab.es/files/PGR2016.pdf		CV, Text understanding	

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15	Sentiment analysis of tweets	Sentiment analysis of tweets. Comparing performance of your implementation with the standard NLTK library's performance. Dataset available.				Text understanding	
16	Student dropout prediction using ML at secondary level in India	Evaluating performance of different classification methods on predicting whether a student will dropout from the secondary level in India. Evaluating transfer of the model on schools from around the world(at least one). Dataset available.		https://www.google.com/url?q=https://drive.google.com/file/d/1TFgQLj0IeyCj0eMeCN9MRcet0a2ht7kU/view?usp%3Dsharing&sa=D&source=hangouts&ust=1551260064504000&usq=AFQjCN_E57h8o3tgp7NLYaTdesCIW1PQ2Q		Data analysis, classification methods	
17	Deformable classifiers	Testing out prediction of classifiers when the dataset is distorted. Specifically dealing with rotated MNIST dataset and evaluating the performance of classifier trained on standard MNIST. Exploring various methods that can be used to improve performance viz. dataset augmentation, adding additional layers. Datasets are publicly available.		https://arxiv.org/pdf/1712.06715.pdf		CV, classification, data analysis	
18	Image Style Transfer Using Deep Neural Nets	The paper proposes an idea to produce new images of high perceptual quality that combine the content of an arbitrary photograph with the appearance of numerous well-known artworks.	Implementation of the original work. As an improvement it could be extended to an interactive application.	https://arxiv.org/pdf/1705.08086.pdf	https://github.com/Yijunmaverick/UniversalStyleTransfer	Deep Learning, CV	
19	Style Transfer in Text: Exploration and Evaluation	The paper aims to achieve stylistic transfer (i.e. writing content from one author in the writing style of another author) even when parallel data is not available for cross validation.	Replication of the original work. As an improvement students should try to extend it to work for Indian authors	https://arxiv.org/pdf/1711.06861.pdf		Autoencoders, NLP	
20	Handwritten Mathematical Expression Recognition from Whiteboards	The paper proposes an encoder-decoder model that recognizes mathematical expression images from two-dimensional layouts to one-dimensional LaTeX strings.	Replicate the proposed model.	https://arxiv.org/pdf/1801.03530.pdf		Encoder- Decoder model, ML	
21	Playing FlappyBird with Deep Neural Network	The agent is not given information about what the bird or pipes look like - it must learn these representations and directly use the input and score to develop an optimal strategy for the game Flappy Bird.	Implementation of the original work. For additional credit, can look at Reinforcement Learning version of the problem. Try to devise a way to sample more experience points close to the danger areas that would improve the performance.	http://cs229.stanford.edu/proj2015/362_report.pdf	http://cs231n.stanford.edu/reports/2016/pdfs/111_Report.pdf	Deep Learning, Reinforcement learning	
22	Predictive analysis of cryptocurrency price	This paper proposes a novel method to predict cryptocurrency price by considering various factors such as market cap, volume, circulating supply, and maximum supply based on deep learning techniques	Full implementation of the paper and replication of the results. Future research should extend the proposed approach by considering additional parameters such as the political environment, human relations, and regulations, which vary across countries.	https://www.sciencepubco.com/index.php/ijet/article/download/17889/7950		RNNs	
23	Semi-Supervised Learning based method for Webpage Classification	In this paper, the authors propose a novel SMFL approach, named semi-supervised multi-view correlation feature learning (SMCFL), for webpage classification. SMCFL seeks for a discriminant common space by learning a multi-view shared transformation in a semi-supervised manner. The correlation between intra-class samples is maximized, and the correlation between inter-class samples and the global correlation among both labeled and unlabeled samples are minimized simultaneously.	Full implementation of the paper. Suggest additional features that could boost the performance of the system.	https://aaai.org/ocs/index.php/AAAI/AAAI17/paper/view/14582		Semi Supervised Learning, ML	
24	Faded Traffic sign detection	Single-image, multi-class classification problem. More than 40 classes	First implement 40 class classification model to detect the traffic sign. After that an expected improvement is expected as detecting the sign board as faded/damaged or not. For the later part you need crawl faded traffic sign images and create a training data.		Data set:- http://benchmark.ini.rub.de/?section=gtsrb&subsection=dataset	Image detection and localization	

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25	Fake News Detection	The top teams show results on a hybrid model of CNN & Tree based model. Even simple MLP models perform quite well. - Implement both the Tree based model as well as MLP/RNNs using existing libraries. - Experiment with additional features that can improve performance. - http://www.fakenewschallenge.org/	All the code should be original. You are not allowed to use available baseline code.		http://www.fakenewschallenge.org/	Text understanding	
26	Implement SVM with several (at least one) kernel(s) from scratch	In this project, we will implement a binary SVM from scratch, using Python and a convex optimization library. On succeeding in this area, we will implement (at least one) kernel trick to make SVM work for non-linear cases. Extensions to clustering, multiclass problems, etc. is straightforward thereafter. Python (solver library: cvxopt)	Implement binary SVM with atleast one kernel(more will be a plus). Also extension to multiclass problem is expected.		http://cs229.stanford.edu/notes/cs229-notes3.pdf	Core ML	
27	Intrusion Detection using Machine learning methods	1. Fast Feature Reduction in intrusion detection datasets (http://ieeexplore.ieee.org/document/6240794/) 2. "Intrusion detection using neural networks and support vector machines," in Neural Networks, 2002. IJCNN '02. 3. Intrusion detection with unlabeled data using clustering 2001. Need to compare all the these approaches mentioned above.	All the three papers need to be implemented	http://ieeexplore.ieee.org/document/6240794/	http://kdd.ics.uci.edu/databases/kddcup99/kddcup99.html	Anomaly Detection	
28	Machine Translation Systems	1. Phrase-Based-Machine-Translation 2. Sutskever et al., 2014 Sequence to Sequence Learning with Neural Networks 3. Test your models on choice of Indian language as target language given source as English 4. Establish thresholds on output of Models for selecting output from one of the two models for single input		https://arxiv.org/pdf/1409.0473.pdf		Machine Translation	
29	A Multifaceted Collaborative Filtering(CF) Model : Recommendation Systems	1. CF deals with building recommendation systems like movie recommender on netflix based on your reviews and choices. 2. Implement baseline CF models mentioned in paper(SVD based). 3. Improve them using technique specified in paper. 4. Evaluate using proper metric.		https://www.cs.rochester.edu/twiki/pub/Main/HarpSeminar/Factorization_Meets_the_Neighborhood-_a_Multifaceted_Collaborative_Filtering_Model.pdf		Collaborative Filtering	
30	Detect Rumor and Stance (Bias) Jointly by Neural Multi-task Learning	1. This project involves implementing baselines for detecting rumours and bias detection(Basic classifiers). 2. Further extended by creating an neural model where both problems are dealt together as provided in linked paper. 3. Create two models specified in paper and evaluate them		https://dl.acm.org/citation.cfm?id=3188729		NLP, Classification	
31	Video content description using Comments	1. Use time-stamped comments to describe a video. 2. Paper provided is for Japanese and Chinese Language extend and implement it for English Language. 3. Collect Data using time-stamped comment data from Facebook Live or Youtube Live Videos. 4. Describe a Facebook Live Video using time stamped comments		https://pdfs.semanticscholar.org/fdcc/b06ca15bb83961cf7d1b62cb7be158a38864.pdf		NLP, Optimisation	
32	Violation detection in videos	This project involved detection violations in the given videos. Violation includes scenes which contain smoking,drinking or obscene imagery. Many organisations around the world still do this process manually. So the ultimate aim is to automate this process. Teams are expected to analyse the given video and show the time-stamps where the video is violating any of the above things.	Live demo which given a video shows the places where the violation occurs	Not any particular paper related to this particular project. Many papers on video classification are there including this one by karpathy https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/42455.pdf		Neural Networks,CNN	

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33	Restaurant rating prediction using yelp dataset and extending it to zomato	This project involved restaurant rating prediction on the basis of various factors that are useful for this purpose. For e.g Yelp dataset has features such as text review, tip information etc. Use these to come up with a model that can be used to predict the rating of the restaurant. Then use the zomato API to extend the same problem to the indian scenario. Team is expected to use techniques like NLP for text reviews etc. to make it as exhaustive as possible. Its an open ended problem and grading will be based on how deep you can go into solving the problem.	ML model to predict restaurant rating with similar analysis on dataset collected from zomato or any other such app which pertains to indian scenario		https://www.yelp.com/dataset/challenge	ML	
34	Stock market forecasting	Prediction of stock market is a long-time attractive topic to researchers from different fields. In particular, numerous studies have been conducted to predict the movement of stock market using machine learning algorithms. We expect you to gather as much data as possible and try to build models which generalise over stock markets of different countries.	1. Data collection from various stock markets 2. Prediction model based on ML 3. Comparative results of different methods over different stock markets			ML	
35	Competitive problem tag generation and similarity analysis	Multi-label classification is an important paradigm in machine learning. In this project you would have to scrape coding websites like - CodeChef, Codeforces etc., and come up with your own set of features to label programming problems. After this you would have to cluster similar problem on the basis of features like tags, problem text, etc.				ML	
36	Prediction whether a user will buy an item on ecommerce listing based on click events	The goal is hence to predict whether the user (a session) is going to buy something or not, and if he is buying, what would be the items he is going to buy. Such an information is of high value to an e-business as it can indicate not only what items to suggest to the user but also how it can encourage the user to become a buyer. For instance to provide the user some dedicated promotions, discounts etc'. The data represents six months of activities of a big e-commerce businesses in Europe selling all kinds of stuff such as garden tools, toys, clothes, electronics and much more.			https://recsys.acm.org/recsys15/challenge/	ML	
37	Audio-based language detection	Train a classifier which can recognize mother tongue from the way someone speaks English. For this, you can take speeches of celebrities (film stars, cricket stars, politicians) whose mother tongue is known and train the classifier.	Live demo during the project presentation	Look at the resources provided here - https://community.topcoder.com/longcontest/?module=ViewProblemStatement&rd=16555&compid=49304 . NOTE: The link is about a different problem – identifying language from speech.		NLP, Speech	
38	Match-a-quote	Given a quote, find a picture which best matches the quote	Find appropriate pictures for Indian quotes: https://www.successories.com/quote/category/1654/indian-leader-quotes/1 , https://www.goodreads.com/quotes/tag/indian-authors	This solves the opposite problem: http://rishimadhok.io/assets/images/Proposing%20Contextually%20Relevant%20Quotes%20for%20Images.pdf			
39	Smartphone predictor	Given various attributes of smartphones, predict brand and model	Scrape web data to obtain features			NLP	
40	Similar Question retrieval (Siamese Network)	Siamese networks learn to differentiate between two inputs. It learns the similarity between them. Implement a Siamese network for extracting similar questions	Implement and replicate the results described in the paper.	http://aclweb.org/anthology/P16-1036		NLP, Deep Learning	
41	Word2Vec representation	Word2vec is a group of related models that are used to produce word embeddings. Word vectors are positioned in the vector space such that words that share common contexts in the corpus are located in close proximity to one another in the space.	Implement word2vec using both skipgram and cbow. Experiment with the hyperparameters and report your observations. Do not use library functions.	https://papers.nips.cc/paper/5021-distributed-representations-of-words-and-phrases-and-their-compositionality.pdf	https://www.youtube.com/watch?v=ERibwqs9p38&t=290s	NLP	
42	Lyric Generation	(i) Given a line of a song, predict the next line (ii) Given the lyrics upto k-th line, predict the next line	Demonstrate performance on translated-to-English lyrics of songs from Indian movies			NLP, RNN	

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43	Category Ranking	Topic-ranking of documents is where each document can be associated with multiple relevant topics. In this problem we are given access to a stream of documents. Each document is associated with zero or more topics from a predefined set of topics.	A variation of perceptron model is being used in the paper. Understand the given model and use some other model to achieve results at par.	http://www.jmlr.org/papers/volume3/crammer03b/crammer03b.pdf	http://www.daviddlewis.com/resources/testcollections/	NLP, Machine Learning	
44	Predict mood of the song from lyrics	Digitization of music has led to easier access to different forms music across the globe. Increasing work pressure denies the necessary time to listen and evaluate music for a creation of a personal music library. One solution might be developing a music search engine or recommendation system based on different moods. Develop a mood classification system from lyrics as well by combining a wide range of semantic and stylistic features extracted from textual lyrics.	Demonstrate performance on translated-to-English lyrics of songs from Indian movies	http://www.aclweb.org/anthology/W15-5939	https://github.com/rasbt/musicmood	NLP	
45	Emotions from text	In addition to information, text contains attitudinal, and more specifically, emotional content. So, a deep analysis done on text can help in detecting the emotion attached with the context.	Study the paper for reference and understand the empirical analysis done. Implement a model that can predict emotion from the text.	https://aclanthology.info/pdf/H/H05/H05-1073.pdf	https://github.com/ilkh/text-emotion-classification	Machine Learning	