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MINOR PROJECT

DESCRIPTION

The project we'll be working on is from a Deep Learning domain, named **Neuro-symbolic AI**. This is a 2-credit project which has been taken by my team for the 7th semester of my bachelor's degree in IIIT Dharwad. So throughout 7th semester, I along with my 3 other batchmates will be working on this project, under Prof. Dr. Arun Chauhan Sir.
Neuro-symbolic AI is something that gives machines that power of common sense, machines can answer the questions asked against the visuals that they see.
E.g, let's say there is an image in which there's a boy standing on a bus stop, there's a bus left to the boy and a tree right to the boy. So, after giving this image to the machine, you can ask questions like: "How many objects are there?", "Which side of the boy is the tree?", "Is the color of objects left to the boy is the same as the color of objects right to the boy?
So using Neuro-symbolic AI and other Algorithmic structure, machines would be able to answer those questions. This is a broad domain of research, so we'll be working on this technology to propose some tuned algorithms, which can show impactful changes compared to some of the published work.

AIM

The main Aim of the project is to firstly check some published work in this domain of Neuro-Symbolic AI, and work on those models to come up with some new ideas/algorithms that can provide better results compared to the published one. And at the last publish our work in some good AI conference.

OBJECTIVE

The objective of the project is to research and design an algorithm so that the machines could think, moreever the model is able to answer the complex question asked to them with best possible accuracy in less training data. And get the results on a global benchmark, so that we can compare our model with existing models. By the end of the semester we'll be coming with an architecture of the technology called Neuro-symbolic AI. Also, Meanwhile we'll be analysing our progress at regular time intervals.

SCOPE

Neuro-symbolic AI has a very huge scope in the field of Artificial Intelligence. It is a fancier version of AI that we have known till now, it uses deep learning neural network architectures and combines them with symbolic reasoning techniques. For instance, we have been using neural networks to identify what kind of a shape or colour a particular object has. Applying symbolic reasoning to it can take it a step further to tell more exciting properties about the object such as the area of the object, volume and so on.

If we look at human thoughts and reasoning processes, humans use symbols as an essential part of communication, making them intelligent. To make machines work like humans, researchers tried to simulate symbols into them. This symbolic AI was rule-based and involved explicit embedding of human knowledge and behavioural rules into computer programs, making the process cumbersome.

ACTIVITIES & TASKS

Project Conception & Initiation

The first stage of starting the project is to do various pre-required tasks related to the project. So here we'll checkout different projects done in the domain of Neuro-symbolic AI, to get a better knowledge about the work that has been done in the domain. Also the aim will be to select some of the work which could be used for reference in future, while designing our model.

Project Definition & Planning

In this stage, we'll discuss our Aim of the project & Objective of the project that finally we'll have to develop at the end of the semester, and Set the timelines for regular discussions, for presentation, and meetings to check our progress with mentors. And lastly we'll distribute the modules among all four team members and start working on building the model

Project Execution

In this stage of development, we'll check for the tech stacks that will be involved in the project and install them, download all the required files like datasets and other dependencies, which will be required for training(if any) or testing the model. And the main implement/development of the modules will be done in this stage, and finally check for status of project and do modification if any (after cross checking the status).

Project Definition & Planning

This will be our last stage of development, in this stage we'll be basically analysing various things and taking the appropriate steps, like analysing performance and improving them. Along

with this, we'll be focusing on documenting the whole project and preparing a detailed step-by-step report, which will be submitted to the college authorities for evaluation. And also writing the paper in conference format, that will be submitted for review in any good AI conference.

The GANTT chart for above Tasks and Activities can be seen below

Refer this spreadsheet for better view: **GANTT CHART spreadsheet link**

GANTT CHART

PROJECT NAME	PROJECT DURATION	PROJECT START DATE	PROJECT END DATE
Neurosymbolic AI	85	20 Sep 2020	14 Dec 2020

TASK ID	Task Description	Task Duration	Start Date	End Date
	Project Conception and Initiation			
1	Literature Survey	5	20 Sep 2020	25 Sep 2020
2	Preliminary Research	4	25 Sep 2020	29 Sep 2020
3	Study Related work	4	29 Sep 2020	3 Oct 2020
4	Finalize some relevant work for Reference	2	3 Oct 2020	5 Oct 2020
	Project Definition and Planning			
5	Set Objectives	2	5 Oct 2020	7 Oct 2020
6	Set Meetings/Timeline/Presentation	3	7 Oct 2020	10 Oct 2020
7	Discuss a Project overview	5	10 Oct 2020	15 Oct 2020
8	Distribute the work	1	15 Oct 2020	16 Oct 2020
	Project Execution			
9	Select the TechStack	3	16 Oct 2020	19 Oct 2020
10	Install Dependencies/Requirements	5	19 Oct 2020	24 Oct 2020
11	Collect/Analyse Data	4	24 Oct 2020	28 Oct 2020
12	Main Implementation	30	28 Oct 2020	27 Nov 2020
13	Final Status Update & Modifications	7	27 Nov 2020	4 Dec 2020
	Project Performance / Monitoring/Submission			
14	Performance Analysis	3	4 Dec 2020	7 Dec 2020
15	Documentation & Submission	7	7 Dec 2020	14 Dec 2020

Phases: PHASE ONE, PHASE TWO, PHASE THREE, PHASE FOUR

THANK YOU

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