CPG-14

Deep Vision Tool

For Image Analysis

Mentor

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Project Overview

- The VQA module to answer natural objective question.
- Context Recognition module for activity classification.
- Depth map estimation network for depth classification.
- Interactive Chatbot to demonstrate underlying mechanisms.
- Integration and Deployment as open source project.

Need Analysis

Applicable to wide spectrum of areas :

- Image Features Extraction.
- Interactive Educational Software.
- Defence and forensics.
- Visual Aid Tool.
- Social Media Applications.
- Research Purposes.

Project Statement

Visual Question Answering with Context Recognition and Depth Analysis of an Image using Deep Learning and Natural Language Processing.

Project objectives

- Higher accuracy and better visualizations for VQA.
- Real Time Image Context Recognition of the image.
- Depth analysis and classification of the image.
- Sequence to Sequence model chatbot for demonstrative purpose.
- Open source deployment of such module and integrated tool.

PROJECT EXECUTION PLAN

Depth Analysis Module

CNN Model

RGBD Dataset

Context Analysis Module

RNN + LSTM Model

FLICKR Dataset

NLP Chatbot Module

Seq to Seq Model

Cornell Movie Dataset

VQA Analysis Module

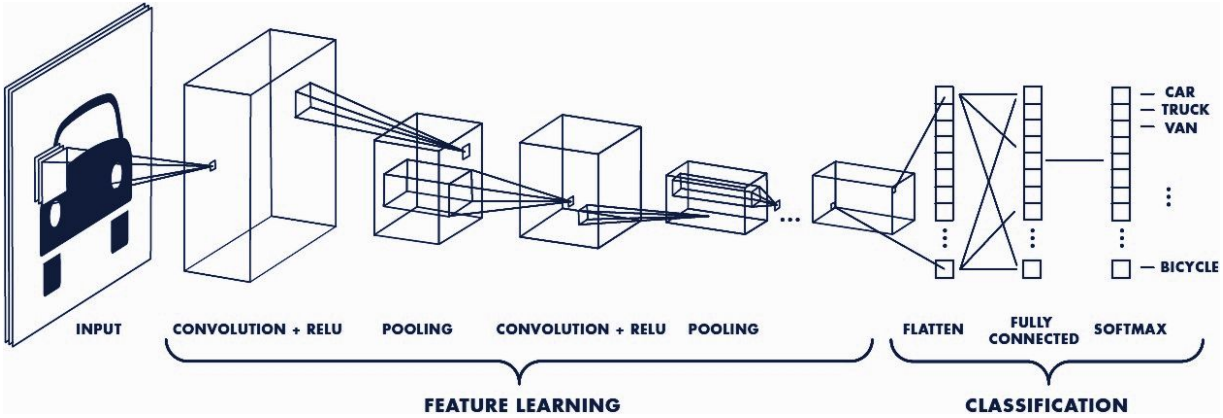
CNN Model

MS-COCO Dataset

DeepVison Module

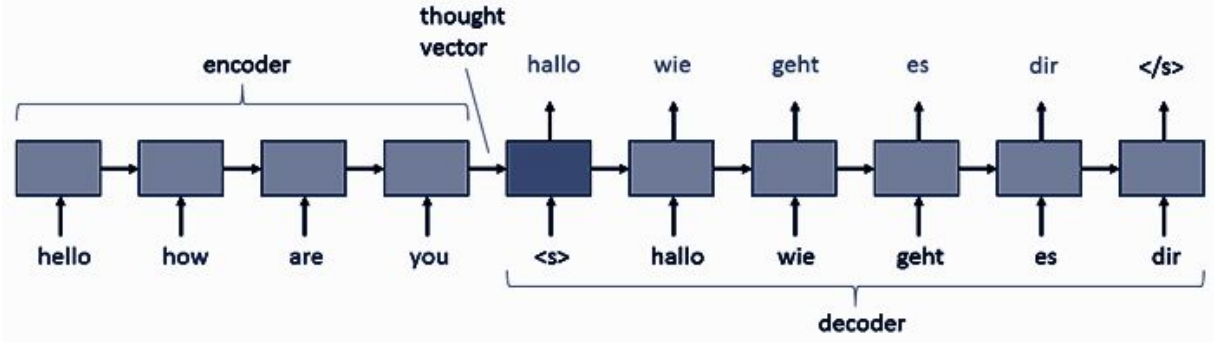
A tkinter python GUI with tensorflow library aims to integrate all modules for open source deployment.

Model Workings



CNN Model

1. Depth Analysis Module
2. VQA Analysis Module



RNN Model

1. Chatbot Module
2. Context Analysis Module

REQUIREMENTS

SOFTWARE

1. TensorFlow Library
2. CUDA Toolkit 8.0.
3. Jupyter Notebook.
4. Tkinter Library.
5. Unit Testing Framework.

HARDWARE

Google Cloud Platform

1. Titan X High Performance GPU.
2. Google Cloud Platform.

DATASETS

FLICKR

25K

CONTEXT ANALYSIS MODULE

MS-COCO

83K

VQA ANALYSIS MODULE

SELF MADE

65K

DEPTH CLASSIFICATION MODULE

CORNELL DB

220K+

NLP CHATBOT MODULE

Project Outcomes

1. Depth analysis on an object in an image with visualizations.

2. Fetch the context from an image and analysis of context network.

3. Provide answers from the image as per objective questions.

4. Helpful for whole community like children, blind people etc.

5. In-depth analysis of image as per need along with visualizations.

WORKPLAN

WP1. Proposal and Synopsis.

WP2. Deep Learning and TensorFlow.

FEB-MAR

APR-MAY

WP3. SDLC Cycle.

WP4. Model Studying and Testing.

JUN-AUG

AUG-SEPT

WP5. Implementation.

WP6. Testing and Optimizations.

OCT-NOV

DEC

WP7. Results.

INDIVIDUAL ROLES

Contribution Proposed Plan

	Deep Learning	NLP Module	Documentation and Diagrams	Open Source	Testing and Optimizations
Ashish Rana 101690011	✓	✓	✓	✓	
Sagar Shivani 101512043	✓	✓	✓		✓
Shaunak Dixit 101562009	✓		✓	✓	✓
Yuvraj Verma 101512062		✓	✓	✓	✓

Thank you.