

EVENT REPORT

IT PROJECT FAIR 2018

(DATE: 3RD APRIL 2018)

Coordinated By:

Prof. Vishal Prajapati

Prof. Yogesh Dangar



G H PATEL COLLEGE OF

ENGINEERING AND TECHNOLOGY

(A CHARUTAR VIDYA MANDAL INSTITUTION)

DEPARTMENT OF INFORMATION TECHNOLOGY

Department of Information Technology, G H Patel College of Engineering and Technology, Vallabh Vidyanagar has organized the "IT Project Fair 2018" on 3rd April 2018.

Total 33 projects were demonstrated by final year IT students. They have displayed the flex banners and rough prototypes of their project to make it easily understandable for junior students who had visited the fair. An open invitation was sent to all the staff members and students of the institute. Second year students and faculties have visited the fair. This fair has provided a great platform for final year students to share their learning, ideas and experiences with the visitors.

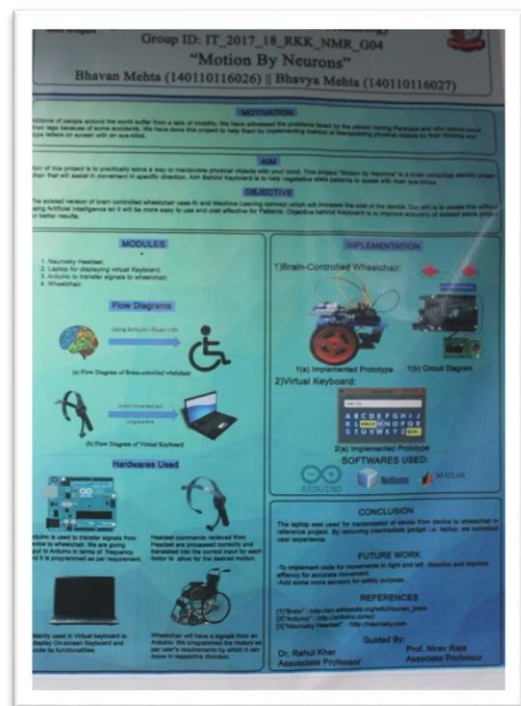
We have invited an expert Prof. Gopi Bhatt, Assistant Professor, from A D Patel Institute of Technology, New V. V. Nagar to judge the projects.

By the judgement of expert Prof. Gopi Bhatt, following 6 projects were chosen in the category of Best 5 projects and they were rewarded with the certificates for same;

Project ID	Enrolment number	Name of Students	Title of Project
ITG04	140110116026	Bhavan Mehta	Motion by Neurons (Brainwave)
	140110116027	Bhavya Mehta	
ITG06	140110116024	Monish Khambhati	Anticipating Future Event using Machine Learning
	140110116025	Deep Kotecha	
	150113116002	Anu Bhatt	

Project ID	Enrolment number	Name of Students	Title of Project
ITG11	140110116021	Tathya Kapadia	Change The Way of Search
	140110116022	Karan Kapadia	
	140110116055	Vishal Senjaliya	
ITG16	140110116002	Janki Bhatt	Video Understanding through Machine Learning A Maverick Approach
	140110116045	Shivam Patel	
	150113116046	Smeet Patel	
ITG19	140110116010	Divyajeetsinh Chauhan	3D Reconstruction
	140110116016	Ghanshyam Desai	
ITG24	140110116030	Mesvania Hardik	IoT Based System for Insemination in Cattle
	140110116058	Shah Urvi	
	150113116006	Patel Janvi	

Photographs of the event



Anticipating Future Events using Machine Learning

Mansah C. Khambhali, Deep J. Kotachia, Anu A. Bhatt
140110118024, 140110118025, 140110118022

Abstract

Understanding human actions and why nature is a complex problem in computer vision. It is harder to get the video generation or classification. However, changing the mode to accurately generate or predict a video is an essential task due to the growth of video content on the internet. In a given video frame, humans can often predict the immediate future events that might happen because the human brain uses an extensive knowledge accumulated over 18 (years). However, future anticipation is very difficult for a machine because of the inherent ambiguity and history of video data. That we want to construct a model that can predict what next is going to happen using intelligent machine learning techniques.

Objective

Empowering our model, this is what we plan to do. Given, at an instant the image frame "A", we need the image frame at "t+1" instant. In a motion video, the 30 frames per second is between 24 to 30 to 30 frames in the higher end.

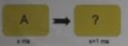


Fig. 1 Frame prediction

If a human is asked to predict what will the next frame be in figure 2, every individual will agree with what we say that the goal is going to hit the ball, but it is what we want to predict in our project. Prospective applications of our project can be behavior models, human action prediction, predicting the success & number video streaming, and compression while live broadcasting.




Fig. 2 A person hitting a ball in a game field

Methods

As the problem definition has been established, we plan to approach this problem by constructing a generative image model which will result in some the images. The goal is to approach with convolutional learning as it is a suitable to filter an entire dataset with each action. Convolutionary machine learning methods include multi-layered long short-term memory model, deep regression networks, adversarial learning, support vector machines, probabilistic models, among other algorithms. That we want to construct a video generative model which selectively predict video frames which in result to future anticipation using convolutionary machine learning models.

Experiment

Data is in machine learning model as input to a human being. The amount of part existing between online from the database, the quantity of our dataset is primarily low contrast with the abundance of the video.

Methodical performance analysis by seeing this, the "MOT3D" dataset is needed to understand complex situations. The solution is to use a neural network to compare the input with recorded actions.

1. Dataset and model design
2. Preprocessing the data
3. Feature extraction
4. Classification and prediction
5. Model training and evaluation
6. Evaluation and comparison

For testing the most important part of the model is to use a neural network to compare the input with recorded actions. The solution is to use a neural network to compare the input with recorded actions. The solution is to use a neural network to compare the input with recorded actions.

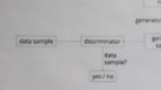


Fig. 3 ConvNet architecture network architecture [2]

The goal of our model is to generate a network which generates actions and the other network evaluates them. The two networks are generator and discriminator as shown in figure 3. Convolutional neural networks are naturally used for classifying data and steps in processing, autonomous images. In this project, we employ them to anticipate the future.

Conclusion & Future Work

There were many challenges and hurdles that we faced. Our model requires low-resolution input frames as we train our model in a minimal scale due to lack of computational power. We believe that if we receive resources we could the model could be trained on high scale with less training times and generate better results. Also, we believe that evaluation of a machine learning model is as good as the data. It is very important to evaluate the output of our model. Here, just our network could be used to conduct optical evaluation systems for the model and its accuracy. We also see that Dr. Hinton's deep belief network could be utilized in the future to generate more accurate results.

References

- [1] UCIP21: A Dataset of 101 Human Actions Classes From Videos in The 300, 640x480 Pixels, Amir Barbu, Simeon Misra, Sreyas Shrivastava, Center for Research in Computer Vision, CVPR, 2012
- [2] Why TensorFlow architecture generator and discriminator networks are essential
- [3] Dynamic Routing Between Capsules, Sara Sabato, Hinton's Project, Google AI, arXiv:1808.08147v1 [cs.LG], 2018

Group Number: IT_2017_18_NNG_006 Guided by: Prof. Nikhil Gondalya
Poster Number: Team Name: Anticipators

Video Understanding through Machine Learning: A Maverick Approach

Janvi D Bhatt, Shivam D Patel, Smeeta P Patel
140110118002, 140110118045, 140110118046

Abstract

The primary aim of this project is to create a generative model capable of generating video of any scene and generate one or more videos that describe the video content. The model, after being fully functional aims to solve a platform of problems ranging from time sequence data to specific search results to measuring descriptions leading to interactive responses to audio and visual content. An optimal and minimalist set of data will be initially used to build the model and the model will be trained by feeding different and an idea of video data as well as by changing the architecture as required and handling the same attributes and parameters to it becomes resilient while working with huge amounts of data.

Objective

The primary aim of our project is to make machine understand the video using machine learning techniques. Given a video input to our model, it should be able to successfully generate one or more videos that describe the central theme of the video. For example, a video of taking on left roads and drive about have a central location of Mountain Biking and not Dirt Road, Person, Sky, and so on [1]. Our model should be able to predict the central theme of the video. So the aim of the project is not to just understand what is present in each frame of the video, but also to identify the key topics that best describe what the video is about.

Experiment

The ultimate goal of the project is to create a generative model capable of generating video of any scene and generate one or more videos that describe the video content. The model, after being fully functional aims to solve a platform of problems ranging from time sequence data to specific search results to measuring descriptions leading to interactive responses to audio and visual content. An optimal and minimalist set of data will be initially used to build the model and the model will be trained by feeding different and an idea of video data as well as by changing the architecture as required and handling the same attributes and parameters to it becomes resilient while working with huge amounts of data.



Fig. 2 2DNN with LSTM Architecture

We finally converted to the decision of using cross entropy loss function and Adam optimizer for our model. We empirically found that learning rate of 0.01 was the best size of 2D model to be optimal.

Results

For each test video, we generate a list of predicted labels and their corresponding confidence scores. The evaluation shows the predicted labels that have the highest confidence scores for each video, and then predict the Global Average Precision (GAP) score of all the predictions and all of the videos. Other metrics that we use to evaluate the model are Hit@1 and Precision at Equal Recall Rate (PER).

Conclusion & Future Work

Designing and building a model with limited computational power and such a huge dataset proved to be a challenging task. The challenge was to maintain an acceptable performance while increasing the dataset size with limited computational resources. But after multiple iterations of our model's architecture and associated parameters, we converged to our final model. With the dataset in consideration, it showcased promising results.

The number of empirical observations that we set video with the existing computational power is limited due to numerous training time as the dataset increases. However, better machine will when computations increased beyond a certain level. Hence, potentially better results could be achieved should the computational power increase. Further, on one could also take into account the audio features to better understand what the video intends to convey and hence, better classify them.

References

[1] YouTube-8M: A Large-Scale Video Classification Benchmark, Simeeta P. Patel, Shivam D. Patel, Smeeta P. Patel, Department: Information Technology, Birla Institute of Technology, Ranchi, India, arXiv:1808.08147v1 [cs.LG], 2018

Objective

The primary aim of our project is to make machine understand the video using machine learning techniques. Given a video input to our model, it should be able to successfully generate one or more videos that describe the central theme of the video. For example, a video of taking on left roads and drive about have a central location of Mountain Biking and not Dirt Road, Person, Sky, and so on [1]. Our model should be able to predict the central theme of the video. So the aim of the project is not to just understand what is present in each frame of the video, but also to identify the key topics that best describe what the video is about.

Experiment

The ultimate goal of the project is to create a generative model capable of generating video of any scene and generate one or more videos that describe the video content. The model, after being fully functional aims to solve a platform of problems ranging from time sequence data to specific search results to measuring descriptions leading to interactive responses to audio and visual content. An optimal and minimalist set of data will be initially used to build the model and the model will be trained by feeding different and an idea of video data as well as by changing the architecture as required and handling the same attributes and parameters to it becomes resilient while working with huge amounts of data.



Fig. 1 Various categories of YouTube-8M Dataset

Group Number: IT_2017_18_RJP_G16 Guided by: Prof. Rajvi Parikh
Poster Number: Team Name: Mavericks

IoT BASED ARTIFICIAL INSEMINATION IN CATTLE

MANSANA HARBH (140110118030) | URBAN SHANKAR (140110118031) | JANANI PATIL (140110118032)

DEPARTMENT OF INFORMATION AND TECHNOLOGY

ABSTRACT

Improvement in the quality of the animal is a major concern for the farmers. The use of IoT based artificial insemination in cattle is a major concern for the farmers. The use of IoT based artificial insemination in cattle is a major concern for the farmers. The use of IoT based artificial insemination in cattle is a major concern for the farmers.

OBJECTS

1. Reception of IoT module
2. Raspberry Pi software installation
3. IoT based artificial insemination in cattle
4. IoT based artificial insemination in cattle
5. IoT based artificial insemination in cattle

REFERENCES

1. g01fs.g01fs.com/infocenter
2. ap01fs.g01fs.com/infocenter
3. g01fs.g01fs.com/infocenter
4. g01fs.g01fs.com/infocenter
5. g01fs.g01fs.com/infocenter

CONCLUSION

By making use of IoT based system, we can have better data security and recording system which can be used as evidence against illegal activities by drug store and dealer. Overall, the system and prediction will be better and cost saving process will be improved.

FACULTY GUIDE

Prof. Shivam P. Patel (Assistant Professor)

Group Number: IT_2017_18_NNG_006 Guided by: Prof. Nikhil Gondalya
Poster Number: Team Name: Anticipators

3D Reconstruction from Images

Divyanshu Chauhan (140110118010) & Ghanshyam Desai (140110118010)

GROUP NO: "IT_2017_18_O19", Guide: Prof. Vinita Shah, Department: Information Technology

Background

The need for generating 3D models has been increasing over the years. The need for generating 3D models has been increasing over the years. The need for generating 3D models has been increasing over the years.

Objective

To reconstruct 3D model of a stationary object from set of 2D images taken by a camera from various positions. Image depth methods for scene flow estimation and depth estimation are used to generate 3D model.

Implementation

The entire project is divided into six stages. Fig. 1 shows accurate reconstruction of 3D model of a stationary object from set of 2D images taken by a camera from various positions.

User Interface



Dataset

Image No.	Image Name	Image Size	Image Type	Image Format	Image Resolution
1	001.jpg	1024x768	RGB	JPEG	1024x768
2	002.jpg	1024x768	RGB	JPEG	1024x768
3	003.jpg	1024x768	RGB	JPEG	1024x768
4	004.jpg	1024x768	RGB	JPEG	1024x768
5	005.jpg	1024x768	RGB	JPEG	1024x768

Conclusion

3D models are used in various domains like gaming, architecture, engineering and others. In general, 3D models are used in various domains like gaming, architecture, engineering and others. In general, 3D models are used in various domains like gaming, architecture, engineering and others.

Future Work

Optimization for real-time 3D reconstruction and generation of 3D model using deep learning techniques.

RESULTS



Fig. 1 3D Reconstruction of a house from multiple 2D images



Fig. 2 3D Reconstruction of a car from multiple 2D images

Group Number: IT_2017_18_RJP_G16 Guided by: Prof. Rajvi Parikh
Poster Number: Team Name: Mavericks

