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NATIONAL STUDENT
PROJECT AWARDS | 2019

AWARD APPLICATION FORM

Project Title	Forest Fire Detection from Satellite Imagery
Name of the College	Army Institute of Technology
Address	Alandi Road , Dighi Hills , Pune

Pin code	411015	Website	www.aitpune.com
Phone No	7507934548	Email	ait@aitpune.edu.in

TEAM DETAILS

Guide Name	Dr. Sangeeta Jadhav	Designation	Dr.
Email	hodit@aitpune.edu.in	Phone	(020) 27157534
Signature	*[signature]*		
Student Full Name	Vighnesh Tiwari	Branch and Semester	IT , 6th Semester
Email	vigneshtiwari_16377@aitpune.edu.in	Phone	7507934548
Signature	*[signature]*		
Student Full Name	Pawan Phalak	Branch and Semester	IT , 6th Semester
Email	pawanphalak_17927@aitpune.edu.in	Phone	7770002052
Signature	*[signature]*		
Student Full Name	Veer Abhimanyu	Branch and Semester	IT , 6th Semester
Email	abhimanyusingh_16449@aitpune.edu.in	Phone	8698570912
Signature	*[signature]*		
Student Full Name	Durgendra Nath Upadhayay	Branch and Semester	IT , 6th Semester
Email	durgendranath_16446@aitpune.edu.in	Phone	8698670571
Signature	*[signature]*		

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Project Introduction

1. Forest fire is a major concern as it causes huge damage to environment. Forest fire detection and coming up with optimal solution is a challenge.
2. The satellite imagery from Planet.com will help in monitoring the surface bed of earth.
3. Imagery of the entire land surface of earth at 3-5 meter resolution are available and a coarse-resolution imagery from Landsat(30 meter pixels) or MODIS (250 meter pixels).

Objectives

1. Forest Fires are not a sudden incidents they occur in steps and the focus is to detect it in latest possible stage.
2. Detecting patches in field where heat-maps give high temperature readings.
3. Detecting nearby local areas to find the sensitivity of incident.
4. Providing an optimal solution recover the fire.

Project Work Distribution

1. Pawan Phalak - GoogleNet(Smoke Detection with Noise Filteration)
2. Durgendra - Mask R-CNN(Masking over detected patches)
3. Vighnesh - Resnet-50(Train an eye in sky)
4. Veer Abhimanyu - Alexnet(Patches Detection)

Algorithms Used

1. ResNet-50 - Residual Network working Instead of learning a direct mapping of $x \to y$ with a function $H(x)$ (A few stacked non-linear layers). Let us define the residual function using $F(x) = H(x) - x$, which can be re-framed into $H(x) = F(x)+x$, where $F(x)$ and x represents the stacked non-linear layers and the identity function(input=output) respectively.
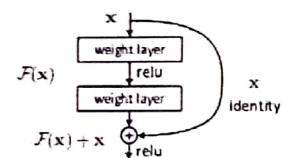
ResNet Architecture Logic

2. GoogLeNet - Application of the network in network architecture in the form of the inception modules is a key feature of the GoogleNet architecture.

3. AlexNet - It contains 5 convolutional layers and 3 fully connected layers. Relu is applied after very convolutional and fully connected layer. Dropout is applied before the first and the second fully connected year. The image size in the following architecutre chart should be 227 * 227 instead of 224 * 224, as it is pointed out by Andrei Karpathy in his famous CS231n Course. More insterestingly, the input size is 224 * 224 with 2 padding in the pytorch torch vision. The output width and height should be (224–11÷4)/4 + 1=55.25
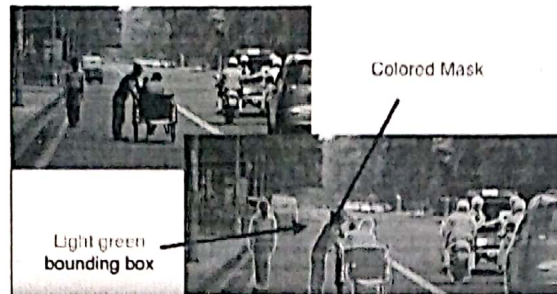

Alexnet Architecture

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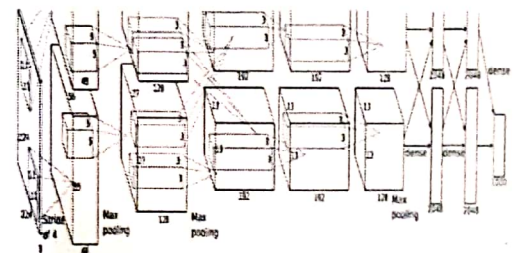
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4,Mask RCNN - Mask RCNN is a deep neural network aimed to solve instance segmentation problem in machine learning or computer vision. In other words, it can separate different objects in a image or a video. You give it a image, it gives you the object bounding boxes, classes and masks. Mask RCNN Architecture was introduced by Facebook AI Research .

Dataset Details

1 Name : Planet Understanding the Amazon from Space.
2 Size : 34 GB
3 Type : .tif files
4 Provider : Planet and SCCON

Conclusion

1.Satellite imagery finds many applications but all of them evolve around object detection and removing noise from the images.

2.Algorithms that were proved to be the best were Resnet-50 ,Alexnet ,GoogleNet and Mask R-CNN for masking the objects found in the image.

3.All algorithms approaches with different way but their comparison over their performance is good to see.

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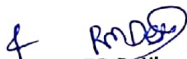Computer Society of India™
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DECLARATION BY PRINCIPAL/ HEAD OF THE INSTITUTION

I certify that the above students are full time engineering students of this Institution and the Project work/Idea showcased is an original work done.

Name and Signature	Dr. BP Patil	Date	24 February 2019

HOD
Department of Information Technology
Army Institute of Technology
Dighi Hills, Pune - 411015.

GIVE TWO PAGE ABSTRACT OF THE PROJECT (NOT EXCEEDING 450 WORDS, CHARTS/DRAWINGS MAY BE ANNEXED)

*Project Abstract on Page 2,3

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Award Rules:

1. There is no fee for participation.

2. The contest is open to all students studying B.E/B.Tech/MCA /M.Sc.Computer Science from affiliated colleges/Universities across India.

3. Participation is open to teams which can have up to five members. Team members can be from any semester, but from the same Institution. There should be a faculty member for each team as the Team Guide.

4. Teams must submit a two page abstract of their project in a specified format. (This Application)

5. The project must be an original work and the abstract must be certified by the Principal or Head of the Institution.

6. The signed copy of the certified abstract should be submitted online at http://csiawards.inapp.in/apply/ on or before 20 Feb 2019.

7. The winners are decided based on a two stage expert evaluation. The first stage evaluation of abstract is based on the project idea and its implementation prospects.

8. The winners selected for second round presentation will be intimated by 15 March 2019 via email.

9. The second round evaluation will be through video conferencing.

10. The final stage of evaluation is the demonstration of the software project before the judging panel, which will be held at Trivandrum, Kerala

11. Project entries will be evaluated based on factors such as Innovativeness, Feasibility and Relevance.

12. The decisions of the award evaluation committee shall be final.

Prizes:

- First Prize: Award Instrument and Rs 50,000
- Consolation Prize: Award Instrument and Rs 25,000
- Placement opportunities and Cash prizes for all finalists

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