Monish Keswani

PROJECT ASSISTANT · MACHINE LEARNING AND VISION LAB, IIT-H

☐ (+91) 9561713408 | ✉ monish.keswani01@gmail.com | ⬡ archmaester | ▭ monish-keswani-30331bb5

Summary

I am a pre-doctoral researcher interested in Deep Learning and Computer Vision. Presently, I am working as Project Assistant at IIT-H on Long-Tail Object Detection. Prior to that, I have worked at IISc as a Project Assistant on Zero-Shot Knowledge Distillation for Object Detection. Resource Efficient (data and training time) deep learning is my area of interest. I have also worked as a Machine Learning Scientist at edisn.ai for developing a Real-Time Player Recognition Engine for sports like Basketball, Soccer, etc. Currently, I am looking for opportunities to broaden my knowledge in Deep Learning and Computer Vision.

Work Experience

Machine Learning and Vision Lab, IIT-H
Hyderabad, Telangana

PROJECT ASSISTANT, UNDER PROF. VINEETH BALASUBRAMANIAN
Feb 2021 - Present

- Project-1: ATLAS: Re-thinking Imbalance in Long-Tail Object Detection
- Project-2: Proto2Proto: Can you recognize the car, the way I do?

Visual Computing Lab, IISc
Bengaluru, Karnataka

PROJECT ASSISTANT, UNDER PROF. ANIRBAN CHAKRABORTY
April 2020 - Jan 2021

- Knowledge Distillation requires training data to transfer knowledge from a complex network (Teacher) to a smaller network (Student). In many cases, the training data may not be available due to data privacy and sensitivity concerns.
- We attempted to solve a challenging and novel problem, i.e., "Knowledge Distillation (KD) for object detection in the absence of training data" where handling dual priorities of object classification and localization is a significant challenge.
- We proposed an algorithm to synthesize pseudo-dataset comprising of pseudo-labels and corresponding *Multi-Object Data Impressions* using a pretrained Faster RCNN based detection model.
- A student model trained on our pseudo-dataset achieves 41.5% mAP on COCO when distilled using Resnet-101 based Faster RCNN teacher.

Edisn.ai
Bengaluru, Karnataka

MACHINE LEARNING SCIENTIST
July 2019 - March 2020

- Core member of the Machine Learning team, built an end to end real-time player recognition engine using Object detection, Object tracking, Team detection, Jersey number recognition and Face recognition.
- Worked extensively on parallel processing in Python. Explored frameworks like Ray and services like TCP/IP to efficiently use CPU and GPU resources.
- Created a novel player tracking algorithm and implemented a smart frame dropping mechanism to cope up with the real-time feed caused by the varying inference time of the models.
- Developed a robust output smoothing mechanism to handle the jitter and fluctuations caused by object detection and recognition engine inferences.

Education

Indian Institute of Science
Bengaluru, Karnataka

7.1/10.0, M.TECH IN COMPUTER SCIENCE
2017 - 2019

V.E.S.I.T
Mumbai, Maharashtra

8.6/10.0, B.E IN COMPUTER ENGINEERING
2012 - 2016

State board of Maharashtra
Mumbai, Maharashtra

83/100, HIGHER SECONDARY EDUCATION IN SCIENCE
2010 - 2012

Publications

Proto2Proto: Can you recognize the car, the way I do?

MONISH KESWANI, SRIRANJANI R, NISHANT S, VINEETH BALASUBRAMANIAN

PUBLISHED AT CVPR 2022

Beyond Classification: Data-free Knowledge Distillation using Multi-Object Data Impressions

MONISH KESWANI*, GAURAV NAYAK*, SHARAN SHESHADRI, ANIBRAN CHAKRABORTY

PUBLISHED AT BMVC-2021

ATLAS: Re-thinking Imbalance in Long-Tail Object Detection

MONISH KESWANI*, SAIRAM R*, UTTARAN SINHA, NISHIT SHAH, VINEETH BALASUBRAMANIAN

UNDER SUBMISSION AT IJCAI-ECAI 2022

Portable Medical Records Using Internet of Things for Medical Devices

Aakash Chhatlani*, Aanchal Dadlani*, Meet Gidwani*, Monish Keswani*, Prashant Kanade

2016 8th International Conference on Computational Intelligence and Communication Networks (CICN)

Patents

System and method for analyzing videos in Real-time

Filed at IPO   *2020*

Thesis Projects

Co-TALL: Co-Attention based Temporal Activity Localization in Videos via Language Query   *IISc, Bengaluru*

Under the guidance of Prof. Ambedkar Dukkipati   *Jan'19 - Jun'19*

- Addressed the problem of temporal activity localization in videos via language query
- Proposed a novel Co-Attention based model consisting of word attention module and visual attention module.
- Highlighted the importance of pre-context and post-context features to boost performance.
- Reported a significant gain in performance when the model is trained against alignment loss and regression loss separately instead of combined loss.
- Improved the time taken to evaluate the model by 6 times as compared to the baseline.

Industry Projects

Real-Time Person Re-Identification and Multi-Object Tracking

Edisn.ai, Bengaluru   *Jan'19 - Mar'19*

- Aimed at recognizing players using Person Re-Identification and Object tracking technique. Compared various Deep Learning based Person Re-Identification and Object tracking models.
- Evaluated the models based on inference time, accuracy, mAP. The best models chosen were then adapted for the sports domain.

Classification, prediction and generation of diverse set of samples from manufacturing domain (Github)

Samsung Research and Development, Bengaluru   *June'18 - Dec'18*

- Aimed at understanding the Generative Adversarial Networks (GANs) based models for generation of time series data which can be used for classification and prediction problems.
- Explored various models of GANs in search for a model which doesn't suffer from drawbacks of the original GAN paper.

Skills

Programming	Python, LaTeX
Frameworks	PyTorch, Tensorflow
Platforms	GCP, GitHub

Achievements

- Secured All India Rank of 21 with 99.99 percentile in GATE'17 [Graduate Aptitude Test in Engineering] (Computer Science)
- Secured $2nd$ position in Technical Paper Presentation event conducted by Indian Society for Technical Education, Student Chapter, VESIT (ISTE-VESIT) and reached the Finals in Technical Paper Presentation (National Level) held at Shah and Anchor Kutchhi College of Engineering, Chembur.
- Secured $3rd$ position in a competition at VISUM summer school, 2021