





Ayushi Dutta

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About Me

Research Interests

Domain

- Machine Learning
- Deep Learning
- Computer Vision
- Natural Language Processing

Past Problems

- Music Recommendation
- Graph Neural Networks
- Multi-label image classification
- Object detection and tracking
- Action recognition
- Anomaly detection

Skills

Programming

- Python
- Matlab
- C++

ML Frameworks

- Pytorch
- Tensorflow
- Caffe
- NLTK
- Gensim
- Scikit
- OpenCV

Tools

- Git
- Docker
- SLURM
- Kubernetes
- AWS

Education

- Jan 2016 - **MS (Research), Computer Science** CGPA: 7.8/10
- Jun 2018 - **IIT Hyderabad, India**
- (Degree: *Advisors: Prof. C.V. Jawahar, Prof. Yashaswi Verma*)
- Dec 2019) *Master's thesis: Blending the Past and Present of Automatic Image Annotation*
- Aug 2007 - **BTech, Computer Science** CGPA: 8.9/10
- Oct 2011 - **SRM University, India**
- Single-subject study
- Nov 2020 - **Advanced NLP** Grade: 10/12, ECTS: B
- Feb 2021 - **University of Copenhagen, Denmark**

Publications

Conference

1. **Ayushi Dutta**, Yashaswi Verma, CV Jawahar. "Recurrent Image Annotation With Explicit Inter-Label Dependencies", *16th European Conference On Computer Vision (ECCV), 2020. [paper]*

Journal

1. **Ayushi Dutta**, Yashaswi Verma, CV Jawahar. "Automatic Image Annotation: The Quirks and What Works", *Multimedia Tools and Applications, June 2018.[doi]*

Research and Development Experience

- Sep 2021 - **Moodagent**
now *Machine Learning Engineer*
 - **Link prediction as recommendation based on users music listening habits:** Working on the problem of recommending multimodal posts(tracks, articles, etc.) related to music, based on the users music listening history. Modelling it as a link prediction problem on a heterogeneous graph of user, music, artists and post nodes, to learn user representations.
- Oct 2020 - **IIT Jodhpur**
- Sep 2021 *Senior Engineer, Advisors: Prof. Yashaswi Verma*
 - **Multi-label image classification:** Learning a joint image-label representation with Graph Neural Networks, that would model both global and spatial image-label correlations.
- Feb 2019 - **Target Corporation** Bangalore
- Sep 2020 *Senior Engineer*
 - **Theft detection in self checkout counter videos:** Worked on the problem of detecting theft from real time video streams of self checkout counters in Target stores. Prototyped the problem with 3 simultaneous tasks, object detection, object tracking and action recognition for robustness. Benchmarked multiple object detection methods for detecting small scale products in low resolution images in different pose, orientation and inference speeds. Explored linear and non-linear tracking, and incorporated object context for action recognition due to highly overlapping action sequences. Worked on scaling this solution to multiple stores.

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Courses

Statistical and Probabilistic
Machine Learning
Neural Networks
Computer Vision
Natural Language Processing
Optimization
Image Processing
Digital Signal Processing

Languages

English(C2), Bengali (Native), Hindi,
Danish(A1)

References

Prof. C.V. Jawahar,
*Amazon Chair Professor &
Dean(R&D), IIT Hyderabad*

Prof. Yashaswi Verma,
*Assistant Professor, IIT
Jodhpur*

Jul 2018 - **Siemens Research** Bangalore
Dec 2018 *Research Intern*

• **Road accidents anomaly detection from Indian traffic videos:** Studied and compared unsupervised spatio-temporal autoencoders, future frame prediction with generative modelling and semi-supervised methods for detecting road accident anomalies in Indian traffic videos.

May 2016 - **IIT Hyderabad (CVIT Lab)** Hyderabad
Jun 2018 *Graduate Research Assistant*, Advisors: Prof. C.V. Jawahar, Prof. Yashaswi Verma

• **CNN-RNN for Multi-label image classification:** Studied CNN-RNN frameworks to improve multi-label image classification by modelling label correlations with RNN and proposed a novel loss function, with which RNNs can model multiple label prediction paths, thus improving the earlier limitation and performance of CNN-RNN methods in the multi-label context. (**ECCV 2020**).

• **Multi-label image classification - what works:** Explored the core issues in the multi-label image classification problem that bounds the performance of various approaches. Designed empirical experiments to study the trade-off of per label/per-image evaluation metric as to what should be preferred. Proposed metrics to quantify the image/label diversity in existing datasets, that can lead to better dataset designs in the future. (**MTA 2018**).

Selected Projects

Dec 2020 - **Compositional skills of RNNs on SCAN tasks**
Jan 2021 *Course:* Advanced NLP, University of Copenhagen.
Worked on testing the compositional skills of RNNs on the SCAN tasks, proposing to incorporate linguistic features like POS tags and curriculum based learning so that RNNs learn simpler tasks first and have additional helpful context. Identified that while the proposed approaches improve performance on the SCAN tasks, they still fail the test of compositionality.

Software Engineering Experience

Aug 2014 - **Cognizant Technology Solutions** Bangalore
Dec 2015 *Associate - Projects*

Software development (large scale web projects, open source and enterprise tools), business analyst(requirement cycle) for major international clients and team management. *Technologies:* IBM Content Management System, Angular JS, Google SDKs, etc..

Jul 2011 - **Avnet Services** Chennai
Jul 2014 *Consultant*

Software development(large scale web projects, open source and enterprise tools) and consulting for major international clients. *Technologies:* IBM Portal, WCM, Process Server, J2EE, Web services, Spring, Hibernate, Javascript, DOJO, JQuery etc..