Shlok Mishra *shlokm@cs.umd.edu* . *+1301-586-2663* . *USA*

Education

University of Maryland, College Park — College Park, MD, USA
PhD in Computer Science — *Aug 2018 – present*
Advisor : Dr. David Jacobs
Cumulative GPA: 3.85

Graduate Research Assistant: Self-Supervised Learning for Representation Learning in Computer Vision

Research Interest: Computer Vision(Self-Supervised Learning), Deep Learning

Relevant Courses: Deep Learning, Computational Linguistics, Advanced Numerical Optimization, Algorithms in Machine Learning:Guarantees and Analyses

Birla Institute of Technology, Mesra — Ranchi, Jharkhand, India
Bachelor of Engineering (BE), Computer Science — *Jun 2012 – Jun 2016*

Publications

Conferences

[1] Songwei Ge, Shlok Kumar Mishra, Chun-Liang Li, Haohan Wang, David Jacobs
"Robust Contrastive Learning Using Negative Samples with Diminished Semantics" Advances in Neural Information Processing Systems 34

[4] Shlok Kumar Mishra, Anshul Shah, Ankan Bansal, Abhyuday Jagannath, Abhishek Sharma, David Jacobs, Dilip Krishnan
"Object-Cropping for Self-Supervised learning" *Transaction on Machine Learning Research 2022*

[2] Shlok Kumar Mishra, Kuntal Sengupta, Max Horowitz-Gelb, Vincent Chu, Sofien Bouaziz, David Jacobs
"Improved Presentation Attack Detection Using Image Decomposition" *IJCB 2022 (ORAL)*

[3] Shlok Kumar Mishra, Anshul Shah, Ankan Bansal, Jonghyun Choi, Abhinav Shrivastava, Abhishek Sharma, David Jacobs
"Learning Visual Representations for Transfer Learning by Suppressing Texture" https://arxiv.org/abs/2011.01901.pdf *BMVC 2022*

[5] Anshul Shah, Shlok Kumar Mishra, Ankan Bansal, Jun-Cheng Chen, Rama Chellappa, Abhinav Shrivastava
"Pose and Joint-Aware Action Recognition"https://arxiv.org/pdf/2010.08164.pdf *WACV*

[6] Janit Anjaria, Hong Wei, Shlok Kumar Mishra and Hanan Samet
"TrajDistLearn: Learning To Compute Distance Between Trajectories" *Proceedings of the 14th ACM SIGSPATIAL*

[7] Shlok Kumar Mishra, Pranav Goel, Abhishek Sharma, Abhyuday Jagannath, David Jacobs, Hal Daume III
"Question Generation for Longer Sequences" https://arxiv.org/pdf/2004.05109.pdf

Submissions

[8] Shlok Mishra*, Joshua David Robinson*, Huiwen Chang, David Jacobs, Aaron Maschinot, Dilip Krishnan. (Under submission ICLR. "CAN: A Simple Contrastive Masked Autoencoder Framework For Scaling To Uncurated Data."

[9] Shlok Mishra*, Songwei Ge*, Chun-Liang Li, Simon Kornblith, David Jacobs. (Under submission CVPR). "Hyperbolic Contrastive Learning for Visual Representations beyond Objects"

[10] Shlok Mishra, Hossam Isack , Sergio Orts-Escolano, Luca Prasso, Rohit Pandey, Franziska Mueller, Abhimitra Meka, Jonathan Taylor, Dilip Krishnan , David Jacobs, Christian Haene.(Under submission CVPR). "Generating Annotated Datasets via Keypoints Conditioned StyleGAN. "

[11] Tianhong Li, Huiwen Chang, Shlok Mishra, Han Zhang, Dina Katabi, Dilip Krishnan. (Under submission CVPR). "MAGE: MAsked Generative Encoder to Unify Representation Learning and Image Synthesis."

[12] Anshul Shah, Aniket Roy, Ketul Shah, Shlok Mishra, David Jacobs, Anoop Cherian, Rama Chellappa (Under submission CVPR). "HaLP: Hallucinating Latent Positives for Skeleton-based Self-Supervised Learning of Actions."

Professional Experience

Google Research — *Aug '21 - Present*
Student Researcher — Washington DC

- Mentor: Dr Dilip Krishnan.
- Working on Self-Supervised learning for uncurated data.
- We built two SSL methods which combine Generative and Discriminative features and improve both image generation and image recognition. The papers CAN and MAGE are under submission.
- **Product Impact:** The embeddings from CAN is being explored for products involving segmentation, object detection and adversarial perturbations. Two groups in Google Lens team are looking at the embeddings with promising initial results where we reduced the error rate by 13%.

Google Augmented Reality — *May '21 - Aug '21*
Research Intern — Mountain View California

- Mentor: Dr. Christian Haene, Dr. Hossam Isack
- Working on using GAN's for domain adaptation.
- We used inference via optimization to control the output of geneartor.
- We also proposed a new architecture to control of Style-GAN using additional keypoint information.

Google Research — *May '20 - Jan '21*
Research Intern — Mountain View California

- Mentor: Dr. Kuntal Sengupta, Dr. Vincent Chu and Dr. Sofien Bouaziz
- Working on face anti-spoof detection by using Intrinsic properties of image.
- We showed that albedo is a better signal to detect spoofs as compared to depth information.
- The internship work got accepted as ORAL to one of the top-tier conferences in Vision and Bio-metrics.

Product Impact: A part of the idea from the internship work was used in the Pixel7 Face Unlock.

Flipkart Internet Pvt.Ltd. BANGALORE, INDIA

Software Development Engineer *Dec '16 - Aug '18*

- Used various machine learning and deep learning models for predicting zipcodes from user address with the help of LSTM, BILSTM, SVM, multinomial logistic regression, ridge regression, LDA and LSI.
- Vehicle Routing Problem: Implemented with help of java spring boot framework and optaplanner an end to end system for Route Planner. Also with the help of Google optimization research tools added new features of slotted delivery and load balancing.
- Dynamic Clustering: Used various clustering algorithms such as K-means, DBScan for dynamic geo-clustering of customer demand and boosting wishmaster productivity.

IPSOFT Global Services *Sep '16 - Dec '16*

Research and Development Engineer BANGLORE,INDIA

- Worked on their dialogue based product "Amelia".
- Responsible for research and implementation of state of the art deep learning models for dialogue based systems.

Projects

Analysis of Transformer Attention Heads For Generation Tasks *Jan '20 - Present*

- We are trying to analyze the effect of pruning attention heads in transformer on generation tasks. Primarily results indicate Tranformer models are heavily over-fitted and 80% of parameters can be replaced without seeing any difference in accuracy.

SBQA: Searching Boosting Question Answering *July '18 -Jan'19*

- Answering questions correctly in a quiz bowl setting where questions consist of multiple clues arranged in descending order of difficulty. Features used were DAN,Map patterns,XGBoost, Elasticsearch.
- Stood 2nd in the Quizbowl Qanta Contest

Skills

Machine Learning, Natural language Processing, Deep Learning, Computer Vision, Matlab, Java, Pytorch, Tensorflow, Python.

Service

Serving as reviewer for major computer vision conferences (CVPR, Neurips, ICLR, AAAI, ECCV, ICCV, etc), NLP conferences (ACL, EMNLP) and journals (CVIU, TMLR, IJCV etc).