Maharshi **Gor**

DEEP LEARNING RESEARCHER · SOFTWARE ENGINEER

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Skill Set

Research Interests:	NLP, Computer Vision, Deep Learning, Machine Learning, Representation Learning, Adversarial Learning
Tools and Technologies:	Python, Java, C/C++, R, Apache Beam, Matlab, JavaScript, SQL, Redis, Neo4j, DGraph, Android ADT
Frameworks:	TensorFlow, PyTorch, Django, Numpy, Scipy, Scikit-Learn, Pandas, Spring, AngularJS, Hibernate ORM, AWS

Education

University of Maryland — *College Park, MD, US*
PH.D. IN COMPUTER SCIENCE – ARTIFICIAL INTELLIGENCE — *2021 - Present*

Visvesvaraya National Institute of Technology (VNIT) — *Nagpur, India*
B.TECH. IN COMPUTER SCIENCE AND ENGINEERING — *July 2012 - May 2016*

Research/Work Experience

Google Research — *New York, United States*
AI RESEARCHER, NLP | MENTORS: PROF. JORDAN BOYD-GRABER, PROF. WILLIAM COHEN — *Aug. 2019 - PRESENT*

- **Towards Deconfounding the Influence of Subject's Demographic Characteristics in Question Answering** [EMNLP 2021]
    - An **analysis study on Question Answering tasks**: Do subject's demographic characteristics matter when models answer a question from four prominent QA Tasks: NQ, SQuAD, QuizBowl and TriviaQA, and if yes what traits entail?
    - Are questions about some professions or gender easier than the others? What skews are presents in these datasets, and do these translate to model accuracies?
- **MATE: Multi-view Attention for Table Transformer Efficiency** [EMNLP 2021, Oral]
    - A novel architecture that **leverages the structure of web tables** to **create Transformer models that have both better inductive bias and a lower(linear) asymptotic memory footprint**, and allows them to scale to sequence lengths of more than 8000 tokens.
    - For HybridQA, a large-scale tabular Question Answering dataset that involves large structured and unstructured data, **we improve results by more than 19 points on accuracy.**

Video Analytics Lab — *Bengaluru, India*
VISITING RESEARCHER | ADVISOR: DR. R VENKATESH BABU — *Jan. 2018- Apr. 2019*

- **GAN-Tree: An Incrementally Learned Hierarchical Generative Framework for Multi-Modal Data Distributions** [ICCV 2019]
    - A hierarchical tree framework for Generative Adversarial Networks (GANs) for learning multimodal disjoint data distributions supporting incremental learning of data samples from a new distribution and maintaining persistency across all versions
- **BiHMP GAN: Bidirectional 3D Human Motion Prediction GAN** [AAAI 2019, Spotlight]
    - A generative approach for 3D human skeleton sequences using a novel Discriminator architecture, enabling content loss in a probabilistic framework
    - Shows superiority, both in terms of qualitative and quantitative measures, over previously available state of the art methods for both long-term human motion generation and short-term forecastings.
- **Unsupervised Feature Learning of Action Sequences as Trajectories in Pose Manifold** [WACV 2019, Oral]
    - Modelled sequences of the pose embeddings as a trajectory in the pose manifold.
    - Achieved competitive state-of-the-art results for action recognition task with minimal supervision on labeled information while comparing against previous fully-supervised deep learning approaches.
- **Pose2Vec - Unsupervised Framework for learning 3D Human Pose embeddings**
    - Hierarchical human skeletal pose modeling framework, using novel variant of Generative Adversarial Networks (GANs), enabling one shot inference from skeleton space to latent space.
    - A Python Library for all preprocessing steps for human-skeleton related tasks implemented in Numpy and Tensorflow.
- **Multi scaled Protein Molecule Detection and Counting from an Image**
    - A business usecase project of Hyperworks Imaging Private Ltd in collaboration with Video Analytics Lab, IISc.
    - YOLO based Multi-scaled CNN architecture to detect and count molecules of radius ranging from 5µm to 200µm.

Amazon — *Bengaluru, India*
SOFTWARE ENGINEER | AMAZON ANDROID APPSTORE — *Aug. 2017 - Dec. 2017*

- Contributed to re-architecture of the back-end services for App Submission and Catalog Ingestion.
- Contributed to Database migration from Oracle to Postgres

Codenation Solutions

Bengaluru, India

SOFTWARE / INNOVATION ENGINEER

July. 2016 - July. 2017

- **Semantics Addition and Relevance Improvement of a Search Engine of an intra-org social network using a Knowledge Graph.**
  - Achieved Word Sense Disambiguation through Lexical and Topological Query Enrichment using Community Clustering on KG.
  - Reduced the TP90 response time from 8s to 500 ms
- **Fuzzy Classification System for source code commits of projects on Version Control Systems.**
  - Developed a commit classification system over a VCS and automated it as service for continuous provision of comprehensive details of the kind of contribution made by a developer on/across project(s)
- **A Gamification Framework around agile processes for achieving enhanced productivity of software developers.**
  - Product-designer and primary architect of the core framework.
  - Created 20 new code quality metrics for measurement of various categories of developer productivity.
  - Introduced, developed, and shipped the prototype to the client in 6 months period.

Publications

Maharshi Gor, Kellie Webster, Jordan Boyd-Graber, "Toward Deconfounding the Influence of Entity Demographics for Question Answering Accuracy", *Empirical Methods in Natural Language Processing (EMNLP), 2021* [pdf] [arXiv]

Julian Martin Eisenschlos, **Maharshi Gor**, Thomas Müller3, William W. Cohen, "MATE: Multi-view Attention for Table Transformer Efficiency", *Empirical Methods in Natural Language Processing (EMNLP), 2021* [pdf] [arXiv]

Jogendra Nath Kundu*, **Maharshi Gor***, Dakshit Agrawal, R. Venkatesh Babu, "GAN-Tree: An Incrementally Learned Hierarchical Generative Framework for Multi-Modal Data Distributions", *IEEE International Conference on Computer Vision (ICCV), 2019* [pdf] [arXiv]

Jogendra Nath Kundu*, **Maharshi Gor***, R. Venkatesh Babu, "BiHMP GAN: Bidirectional 3D Human Motion Prediction GAN", *33rd AAAI Conference on Artificial Intelligence, 2019* [pdf] [arXiv]

Jogendra Nath Kundu*, **Maharshi Gor***, Phani Krishna Uppala, R. Venkatesh Babu, "Unsupervised Feature Learning of Action Sequences as Trajectories in Pose Manifold", *IEEE Winter Conf. on Applications of Computer Vision (WACV), 2019* [pdf] [arXiv]

* equal contribution - names listed alphabetically

Honors & Awards

2019	**Dean's Fellowship - Admission to PhD, CS (AI Track)**, University of Maryland, College Park	
2019	**Microsoft Research Travel Grant**, AAAI 2019	
2019	**ACM India-IARCS Travel Grant**, AAAI 2019	
2018	**Country Rank (United States) 43, across 100,000 active users**, CodeChef Rankings	*Profile Link*
2013–16	**Top 60 every year, across over 6000+ teams** , ACM ICPC (International Collegiate Programming Contest) on-site Asia Regionals	
2013–15	**Consistent 1st prize Winner**, Freak-O-Matix, the open mathematics Olympiad at VNIT (Undergrad)	
2009-11	**Country Rank (India) 22, State Rank in top 5**, Indian National Mathematics Olympiad (INMO)	

Activities

2020-21	**Reviewer**, NeurIPS 2021, ACL 2021, EMNLP 2020, ICML 2020, ACL 2020	*New York, US*
2018	**Problem Setter**, MindSpark 18 Codeathon, organized by College of Engineering, Pune on Codechef.	*Pune, India*
2017	**Problem Setter**, CodeAgon 2017 - The All India Hiring Challenge for Codenation Solutions.	*Bengaluru, India*

Certifications

2018	**Five course Specialization on Deep Learning, deeplearning.ai**, offered by Andrew Ng	*Certificate Link*
2017	**Machine Learning, Stanford University**, offered by Andrew Ng	*Certificate Link*
2017	**Introduction to Data Science in Python**, University of Michigan	*Certificate Link*