Ashwinkumar Ganesan

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Summary

My broad areas of interest are Artificial Intelligence & Machine Learning looking to use **natural language processing** to build a better connected world. Currently, I am a **Research Scientist @ Amazon AGI**. Previously, I worked at Amazon Alexa. My PhD research was focused on improving *NLP* systems using deep learning methods to make information retrieval, searching & question answering on *chatbots* efficient with limited data.

Employment History

Amazon
Research Scientist (March 2021 – Present)

- Working on Large Language Models (LLMs) for Conversation AI.
- Research in Natural Language Processing & Machine Translation at Alexa.

CORAL Lab @ UMBC
Research Assistant (August 2014 – May 2021)

GE Global Research
Research & Development Intern (Machine learning Lab) (May 2016 – August 2016)
Deep learning for time series feature extraction and classification.
Advisor: Dr. Weizhong Yan

Apkudo LLC
Embedded Software Engineer (September 2012 – August 2014)
Team Coordinator & Engineer with experience in Agile Methodology.

- Worked with Android operating system including the kernel.
- Design secure layer in Android to store and enforce app security policies by controlling device IPC.
- Worked as developer & team coordinator, executing agile development cycle and client interfacing.

Symantec Corporation
Software Development Intern (June 2011 – August 2011)

- Design & implement QA automation test cases set for Symantec's Critical System Protection product.
- Achieved complete automation of network tests on different operating systems and flavours including Redhat, Windows, HP-UX and Solaris.

Niyuj Enterprise Software Solutions
Senior Member of Technical Staff (November 2009 – August 2010)
Test Engineer & Team Coordinator for Symantec's CSP product.

Tata Consultancy Services
Assistant Systems Engineer (Sept. 2007 – Oct. 2009)
Performance Testing Engineer for applications working with HP LoadRunner & Performance Center.

Publications

Conferences & Workshops.

*** represents equal contribution.**

[1] Akshaya Vishnu Kudlu Shanbhogue, Ran Xue, Soumya Saha, Daniel Zhang, and **Ashwinkumar Ganesan**. Improving low resource speech translation with data augmentation and ensemble strategies. In Elizabeth Salesky, Marcello Federico, and Marine Carpuat, editors, *Proceedings of the 20th International Conference on Spoken Language Translation (IWSLT 2023)*, pages 241–250, Toronto, Canada (in-person and online), July 2023. Association for Computational Linguistics

[2] Daniel (Yue) Zhang*, **Ashwinkumar Ganesan***, Sarah Campbell, and Daniel Korzekwa. L2-gen: A neural phoneme paraphrasing approach to l2 speech synthesis for mispronunciation diagnosis. In *Interspeech 2022*, 2022

[3] Daniel Zhang*, Jiang* Yu, Pragati Verma*, **Ashwinkumar Ganesan***, and Sarah Campbell. Improving machine translation formality control with weakly-labelled data augmentation and post editing strategies. In *Proceedings of the 19th International Conference on Spoken Language Translation (IWSLT 2022)*, pages 351–360, Dublin, Ireland (in-person and online), May 2022. Association for Computational Linguistics

[4] Akshay Peshave, **Ashwinkumar Ganesan**, and Tim Oates. Predicting network threat events using hmm ensembles. In *Advanced Data Mining and Applications: 17th International Conference, ADMA 2021, Sydney, NSW, Australia, February 2–4, 2022, Proceedings, Part I*, pages 229–240, 2022

[5] **Ashwinkumar Ganesan**, Hang Gao, Sunil Gandhi, Edward Raff, Tim Oates, James Holt, and Mark McLean. Learning with holographic reduced representations. In *Advances in Neural Information Processing Systems.*, 2021. **Spotlight Paper (Top 3%)**

[6] **Ashwinkumar Ganesan**, Francis Ferraro, and Tim Oates. Learning a reversible embedding mapping using bi-directional manifold alignment. In *Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021*, pages 3132–3139, Online, August 2021. Association for Computational Linguistics

[7] **Ashwinkumar Ganesan**, Francis Ferraro, and Tim Oates. Locality Preserving Loss: Neighbors that Live together, Align together. In *AdaptNPT: The Second Workshop on Domain Adaptation for NLP at EACL*, April 2021

[8] Bharat Prakash, Nicholas Waytowich, **Ashwinkumar Ganesan**, Tim Oates, and Tinoosh. Mohsenin. Guiding safe reinforcement learning policies using structured language constraints. In *2nd Workshop on SafeAI.* AAAI, 2020

[9] Komal Sharan, **Ashwinkumar Ganesan**, and Tim Oates. Improving visual reasoning with attention alignment. In *International Symposium on Visual Computing*, pages 219–230. Springer, 2019

[10] Chi Zhang, Bryan Wilkinson, **Ashwinkumar Ganesan**, and Tim Oates. Determining the scale of impact from denial-of-service attacks in real time using twitter. *DYnamic and Novel Advances in Machine Learning and Intelligent Cyber Security Workshop (ACSAC Conference)*, 2018

[11] **Ashwinkumar Ganesan**, Pooja Parameshwarappa, Akshay Peshave, Zhiyuan Chen, and Tim Oates. Extending signature-based intrusion detection systems with bayesian abductive reasoning. *DYnamic and Novel Advances in Machine Learning and Intelligent Cyber Security Workshop (ACSAC Conference)*, 2018

[12] Sandeep Nair Narayanan, **Ashwinkumar Ganesan**, Karuna Joshi, Tim Oates, Anupam Joshi, and Tim Finin. Early detection of cybersecurity threats using collaborative cognition. In *2018 IEEE 4th International Conference on Collaboration and Internet Computing (CIC)*, pages 354–363. IEEE, 2018

[13] Prutha Date, **Ashwinkumar Ganesan**, and Tim Oates. Fashioning with networks: Neural style transfer to design clothes. *ML4Fashion'17 Halifax, Nova Scotia - Canada*, 2017

[14] Mandar Haldekar, **Ashwinkumar Ganesan**, and Tim Oates. Identifying spatial relations in images using convolutional neural networks. In *Neural Networks (IJCNN), 2017 International Joint Conference on*, pages 3593–3600. IEEE, 2017

[15] **Ashwinkumar Ganesan**, Kiante Brantley, Shimei Pan, and Jian Chen. Ldaexplore: Visualizing topic models generated using latent dirichlet allocation. *Intelligent User Interfaces - TextVis Workshop*, 2015

Journals.
[1] A. Jafari, **A. Ganesan**, C. S. K. Thalisetty, V. Sivasubramanian, T. Oates, and T. Mohsenin. Sensornet: A scalable and low-power deep convolutional neural network for multimodal data classification. *IEEE Transactions on Circuits and Systems I: Regular Papers*, pages 1–14, 2018

[2] David R Riley, Karsten B Sieber, Kelly M Robinson, James Robert White, **Ashwinkumar Ganesan**, Syrus Nourbakhsh, and Julie C Dunning Hotopp. Bacteria-human somatic cell lateral gene transfer is enriched in cancer samples. *PLoS computational biology*, 9(6):e1003107, 2013

PhD Thesis.
[1] **Ashwinkumar Ganesan**. *Supervised Training Strategies for Low Resource Language Processing*. PhD thesis, University Of Maryland, Baltimore County (UMBC), 2021

Masters Thesis.
[1] **Ashwinkumar Ganesan**. *Calculating Representativeness of Geographic Sites Across the World*. University of Maryland, Baltimore County, 2012

Posters.
[1] Bharat Prakash, **Ashwinkumar Ganesan**, Sarthak Mehta, John Cellozi, and Frank Ferraro. Improving grammatical error correction using multi-task learning. *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL).*, 2018

[2] Bryan Wilkinson, **Ashwinkumar Ganesan**, and Tim Oates. Shell: Scoring human-like errors in generated language. *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL).*, 2017

Education

Ph.D. Computer Science
University of Maryland, Baltimore County (UMBC) (August 2014 - Spring 2021)
CGPA – 3.75 / 4.0
Dissertation: Supervised Training Strategies for Low Resource Language Processing
Advisor: Tim Oates
Co-Advisor: Frank Ferraro
Research Lab: Cognition, Robotics & Learning (CoRAL)
Committee: Konstantino Kalpakis, Tim Finin, Marc Pickett (Google Research)

Masters of Science Computer Science
University of Maryland, Baltimore County (UMBC) (August 2010 - August 2012)
CGPA – 3.71 / 4.0
Thesis: Calculating Representativeness of Geographic Sites Across the World
Advisor: Tim Oates
Research Lab: Cognition, Robotics & Learning (CoRAL)

Bachelor of Engineering
University of Pune (August 2003 - June 2007)
GPA – 3.8 / 4.0

Conference & Workshop Program Committee / Review

[1] Neural Information Processing System Conference (NeurIPS) (2024, 2023, 2016)

[2] International World Wide Web Conference (WWW) (2024, 2023)

[3] Association for the Advancement Of Artificial Intelligence (AAAI) (2019, 2018)

[4] International Conference on Computational Linguistics (COLING) (2018)

[5] Computer Vision & Pattern Recognition (CVPR) (2018)

[6] North American Chapter of the Association for Computational Linguistics (NAACL) (2019, 2018)

[7] European of the Association for Computational Linguistics (EACL) (2020)

[8] International Joint Conference on Artificial Intelligence (IJCAI) (2019)

[9] Empirical Methods on Natural Language Processing (EMNLP) (2023, 2022, 2021, 2020, 2018, 2017)

[10] IET Computer Vision (Journal) (2018)

[11] Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) (2018)

[12] International Conference on Tools with Artificial Intelligence (ICTAI) (2020)

[13] Amazon Machine Learning Conference (AMLC) (2022)

[14] MDT-ASONAM Workshop (2019)

[15] Mid Altantic Student Colloquium (MASC) (2015)

Research Funding Proposal Review

[1] Amazon Research Awards (ARA) (2022)

Skills

Platforms: Linux, Windows.
Languages & Tools: Python, Tensorflow & PyTorch (Deep Learning), MongoDB, scikit-learn, gensim, WEKA, Java, Unix Shell Scripting, C.

Awards & Recognition

[1] Empirical Methods on Natural Language Processing (EMNLP) Outstanding Reviewer (2020)

[2] 35th Graduate Research Conference (GRC) Poster winner (2012)

In the Press

[1] **A model to determine the impact of DDoS attacks using Twitter Data**. `https://techxplore.com/news/2019-10-impact-ddos-twitter.html`. Published: 2019-10-03

[2] **Amazon Has Developed an AI Fashion Designer**. `https://www.technologyreview.com/s/608668/amazon-has-developed-an-ai-fashion-designer/`. Published: 2017-08-24

Academic Positions

UMBC Graduate Students Association (GSA)
Senator (August 2014 - August 2016)

UMBC CSEE ACM Chapter
President (August 2015 - May 2016)

UMBC Dept. Promotions & Tenure Committee
Student Representative (August 2015 - January 2016)

Analyze student feedback information & vote to decide faculty tenures.

UMBC Dept. Of Computer Science & Electrical Engg.
Teaching Assistant (August 2011 - May 2012)
Courses:
Introduction to Artificial Intelligence (CMSC 671), Introduction to Artificial Neural Networks (CMSC 675), Introduction to Database Management Systems (CMSC 461).

***References available on request.**
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