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 Alexa AI**. 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 Alexa AI
Research Scientist (March 2021 – Present)
Research in Natural Language Processing & Machine Translation

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.

[1] **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

[2] 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

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

[4] 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

[5] **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

[6] 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

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

[8] 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

[9] **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

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 Paper Reviews

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

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

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

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

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

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

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

[8] Empirical Methods on Natural Language Processing (EMNLP) (2020, 2018, 2017)

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

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

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

[12] MDT-ASONAM Workshop (2019)

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

Skills

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

Student Thesis Research Mentoring

[1] Mandar Haldekar M.S. Computer Science - 2016
Representing Spatial Relations using Convolutional Neural Networks

[2] Prutha Date M.S. Computer Science - 2017
Personalizing Apparel Using Neural Style Transfer

[3] Sushant Athley M.S. Computer Science - 2017
Cognitive Intelligence in Relational Databases

[4] Komal Sharan M.S. Computer Science - 2018
Attention Correction Mechanisms in Visual Contexts in Visual Question Answering

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

Additional Research Projects

[1] **Manifold Alignment.** Semi-supervised learning is important and useful in domains where supervised data is low. Manifold Alignment is used to perform semi-supervised learning in domains where such data points are minimal such as cross-lingual alignment (aligning documents or text from one language to another).

[2] **ZEUS.** A lot of recent focus and research has been on deep learning. *Zeus* is framework to analyze and understand the internal working of neural networks and understand how data is represented and stored within it. We study a different neural network architectures with a variety of datasets to provide a way to understand these representations correlate the inner workings of the network with the data outside.

[3] **Active Learning Enabled Robot Interaction.** Today, robots have the ability to interact with human beings. Our research tries to design algorithms for robots to learn how to interact with human beings using a standard language like english and find a way to associate what is being said with objects in the outside world. One such method we use is *Active Learning* which allows the robot to learn by asking questions to human.

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).

Undergraduate Activities

[1] Started the undergraduate college security group and taught sessions on security programming and various attacks.

[2] Part of the college Linux-Users group and taught students Linux installation & programming.

[3] Teaching Assistant (TA) for Operating Systems, Principles of Compiler Design and C Programming courses at my undergraduate college.

[4] Won the "Best Systems Project" Consolation Prize in B.E Project competition "Intechxication 2007" held at MIT, Pune.

[5] Part of organizing committee for the international competition ROBOCON (ABU) in the year 2005 and 2007.

[6] Part of the technical group taking part in ROBOCON 2006 and worked on programming for controllers.

***References available on request.**
Last Updated: April 23, 2021